Tuning

Tuning
Educational Structures
in Europe

Universities' contribution to the Bologna Process


Final Report
Pilot Project - Phase 2

Education and Culture

Socrates

Tuning Educational Structures in Europe II

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Universities' contribution to the Bologna Process

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Tuning websites

Tuning Educational Structures in Europe:
http://europa.eu.int/comm/education/policies/educ/tuning/tuning_en.html
http://tuning.unideusto.org/tuningeu
www.rug.nl/let/tuningeu

Tuning America Latina:
http://tuning.unideusto.org/tuningal
www.rug.nl/let/tuningal

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PART TWO

Introduction

The Bologna Process is at the halfway point in the ten year period foreseen for its implementation, 1999-2010. The Tuning project, now in its fifth year, was launched in 2000, one year after European Ministers signed the Bologna Declaration. As the Bologna process has developed, involving more and more countries, and focussing on its general objectives in an ever clearer way, Tuning too has expanded its activities, involving new geographic areas and elaborating strategies to respond to the increasingly complex understanding of the needs of higher education.

Tuning is closely involved in the Bologna process, collaborating and creating synergies with other important actors. Tuning represents the awareness that in final analysis —in the Bologna process— it is the Universities, their staff and their students, because of their specific knowledge and experience, that must elaborate appropriate and concrete strategies for innovation. Tuning is a University driven project, in which Universities have contributed effectively, systematically and in a coordinated manner to the new challenges and the novel opportunities created by European integration and the emergence of a European higher education space.

This book is intended to give the reader an overview of the results of the second phase of the Tuning project. These results are available in extended form on the Tuning website, along with those that emerged from the first phase of the project. In this Introduction, we intend first to place Tuning in the more general context of innovation and the search for quality in higher education; second, to provide a synthetic description of the contents of this volume.

Tuning has brought together a group of experts, highly qualified in their fields, from 135 reputed European higher education institutions

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in 27 countries. It has provided a structured way for them to work together, both on issues regarding a significant number of pilot subject areas and on aspects relevant to the entire area of higher education. In a carefully organised process of dialogue and debate they have reached deeper levels of understanding regarding the elements which constitute the essence of degree programmes in a national and international setting. Both common and diverse elements have been identified and formulated in wording which is commonly understood. Tuning has proved to be an effective way of reaching international consensus while respecting —and indeed utilising in a positive way— the rich diversity of educational traditions and the specific experience and insight of different subject areas. In the course of its operation, the project has developed a common language, an agreed glossary and conceptual framework. Thus it favours dialogue between different academic traditions and it facilitates mutual understanding and transparency between Universities and the broader community of stakeholders —that is, in final analysis, society at large. It has stimulated a process of reflection, development and innovation in higher education programmes. All of this has constituted an intense and demanding, but ultimately useful and rewarding, learning process for all involved.

In general terms, we may consider that the major reason for starting the Tuning project was to contribute to the search for higher quality at University level. Such was the basic aim of the Bologna and Lisbon processes as well. Both showed a political desire and willingness to strengthen and enhance the European economic area by working towards a strong European higher education sector. These important political initiatives needed to be supported and accompanied by coordinated activities carried out by strong autonomous Universities. The importance of the role of Universities and higher education institutions in general is clear not only to the Ministers of Education, but to all other key players as well. This can be seen for example in the European Commission's position papers on *The role of universities in the knowledge based society* (2003) and *Mobilising the brainpower of Europe: enabling universities to make their full contribution to the Lisbon Strategy* (2005) and in the paper *From Berlin to Bergen. The EU Contribution*. Furthermore, the institutions themselves in their organisations have claimed a central role, as can be seen in the EUA conventions of Salamanca, Graz and Glasgow.

Other key players —the students— through their European organization ESIB as well as through their national student associations, have recognized the central role of Universities in elaborating appropriate strategies for innovation. Stakeholders such as professional organizations and employers have become more aware than ever before of the education institutions. Further players of great importance in the process are the national quality agencies and their European association, ENQA. ENQA's basic task is to stimulate the development and maintenance of quality in University programmes.

Tuning's specific role in this general panorama has been to stimulate and incorporate the knowledge and experience of academics in the overall process of building the European Higher Education Area. Much of Tuning's work focuses on the role of subject areas. This aspect of Tuning reflects the conviction that only those who have actual knowledge and experience in teaching and research at an advanced level can create the framework for developing new programmes and guarantee their quality, in design and delivery, in the new transnational context. Strong Universities of high quality will be ready to meet new challenges, committed to improvement and willing to change. Tuning has provided a platform for developing understanding and insight into how this can best be accomplished.

The First Phase

In the first phase of Tuning (2000-2002) a methodology was developed to design and to deliver degree programmes on the basis of well identified profiles, translated into learning outcomes expressed in competences and linked to ECTS credits based on student workload. Tuning developed reference points for the design and implementation of degree programmes. The process can be summarised in the so-called «Tuning dynamic quality development circle». The results of Tuning 1 are available in book form and on the Tuning website.

In Tuning 1, attention was devoted to the concept of profile. A degree profile, according to Tuning, should be based on a process of consultation with the most significant stakeholders for the degree programme. These stakeholders are not only academics and students, but also graduates, employers and professional organizations. The latter three groups represent an important link to the needs of society. Although consultation with these groups is very important in the design, delivery and further improvement of any programme, Tuning is convinced that the formal University bodies as well as the academic faculty involved must ultimately be responsible for the actual design of each programme. They have to judge how a programme can prepare students in the best possible way for their future as citizens and members of society. University bodies and personnel, in final analysis, are those best equipped to identify the means required to offer a degree programme —in terms of academic staff, logistic and technical support and so forth as well as in terms of course units and programme design.

Tuning is fully aware of the importance of developing subject specific knowledge and skills as the basis for University degree programmes. However it has also highlighted the fact that time and attention should be devoted to the development of generic competences or transferable skills. The relevance of generic competences in preparing students for their future role in society in terms of employability and citizenship is becoming ever more fully recognised. As part of Tuning I, a consultation was carried out among graduates, employers and academics to order to identify the most important generic competences for each of the academic fields involved. Although the generic competences judged to be more relevant differed slightly in the different subject areas, overall there was a striking similarity in the findings between the various fields. In all fields typical academic competences like the capacity for analysis and synthesis, the capacity to learn and problem solving were identified as being the most important ones. However, graduates and employers, who proved to be in remarkably close agreement, thought that other generic competences, less evidently linked to traditional academic learning, were very important for employability too. These competences included, for example, the capacity for applying knowledge, the capacity to adapt to new situations, concern for quality, information management skills, ability to work autonomously, team work, capacity for organizing and planning, oral and written communication in the native language as well as interpersonal skills. Graduates and employers concluded that some of the mentioned competences above were of more use and needed to be developed to a higher level than others. They drew attention to the fact that more attention should be given to a number of generic competences to prepare students better for their future workplace.

The seven pilot subject area groups in Tuning I (Business Administration, Chemistry, Education Sciences, History, Geology/Earth Sciences, Mathematics and Physics), also developed working documents identifying the most relevant subject-specific competences. Although the approaches of the seven groups differed, because of differences in the structure of the disciplines, all groups followed a similar procedure to obtain their results. Through discussion, creation of reciprocal knowledge and mapping the ways the discipline is learned and taught in the various countries, insight was gained and consensus built on what constitutes the vital core of each subject area. The documents which resulted were understood to be working documents, subject to further elaboration and change: it is clear in fact that education is a very dynamic activity, continuously subject to development and innovation.

In the first phase of Tuning much attention was also devoted to the role of credits in organising the learning process. Tuning 1 concluded that ECTS should be accepted as the only credit system for Europe and should be built as soon as possible into the national educational systems. However, Tuning also came to the conclusion that considerable clarification had to be made with regard to the underlying concept and the practical implementation of ECTS. First of all it was proposed to change the ECTS transfer system into a transfer and accumulation system, using credits based on student workload measured in time both for international mobility purposes and for regular students, but giving an absolute value to the credits, rather than a relative one as had been done in the initial phases of ECTS. Secondly, Tuning argued that the only realistic way forward was to link credits (and hence workload or volume of learning expressed in students' time) to learning outcomes achieved by the students/learners. These learning outcomes are to be expressed in terms of competences obtained by the students. The contribution of Tuning resulted in the new European Credit Transfer and Accumulation System, still known as ECTS to avoid confusion, and clearly described in the new ECTS Users' Guide published by the European Commission in the summer of 2004.

During Tuning I, definitions of the terms «profile», «learning outcomes» and «competences» were formulated in order to ensure clarity and coherence. The definitions adopted were developed further during the second phase of the project. In Tuning, a clear distinction is made between «learning outcomes» and «competences». At present Tuning uses the definitions in the box below, which are fully in line with the current phase the international debate, although we are well aware that in some countries slightly different definitions are used.

Tuning definitions

—Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a learning experience. They can refer to a single course unit or module or else to a period of studies, for example, a first or a second cycle programme. Learning outcomes specify the desired requirements for award of credit. They are formulated by academic staff.

—Competences represent a dynamic combination of knowledge, understanding, skills, abilities and values. Fostering these competences is the object of educational programmes. Competences will be formed in various course units and assessed at different stages. Competences are obtained by the student.
—Learning outcomes are expressed in terms of competences. Competences may be developed to a greater degree than the level required by the learning outcome.

Further developments

After the first phase of Tuning came to an end, there have been many new developments. A number of these are directly related to the work done by Tuning. They confirm that the aims and objectives of Tuning are closely linked to the general European higher education agenda and that Tuning's work has allowed particular focus on the essential role of Higher Education Institutions and their academic staff.

A major event during this period was the ministerial Bologna follow-up conference which took place in Berlin in September 2003. The priorities indicated in Berlin show that degree programmes were identified as having a central role in the Bologna process. With regard to quality, it is clear that among the several issues involved, quality at degree level has been singled out for a key role. And finally, the issue of recognition links up with compatibility and comparability of degree programmes by making use of common reference points. The conceptual framework on which the Berlin Communiqué is based is completely coherent with the Tuning approach. This is made evident by the language used, where the Ministers indicate that degrees should be described in terms of workload, level, learning outcomes, competences and profile.

As a sequel to the Berlin conference, the Bologna follow-up group has taken the initiative of developing an overarching *European Qualifications Framework* which, in concept and language, is in full agreement with the Tuning approach. The EFQ has made use of the outcomes both of the Joint Quality Initiative and of Tuning. The JQI produced a set of criteria to distinguish in a broad and general manner between the different cycles. These criteria are generally known as the «Dublin descriptors». From the beginning, the JQI and the Tuning project have been considered complementary. The JQI focuses on the comparability of cycles in general terms, whereas Tuning seeks to describe cycle degree programmes at the level of subject areas. An important aim of all three initiatives (EFQ, JQI and Tuning) is to make European higher education more transparent. In this respect, the EFQ is a major step forward because it gives guidance for the construction of national qualification frameworks based on learning outcomes and competences as well as on credits. We may also observe that there is a parallel between EQF and Tuning with regard to the importance of setting-up a dialogue between higher education and society and the value of consultation —in the case of the EFQ with respect to higher education in general; in that of Tuning with respect to degree profiles.

The report of the EQF working group was endorsed in a Bologna seminar held in Copenhagen in January 2005 and adopted at the ministerial summit held in Bergen on 19-20 May 2005. The preparation for the ministerial summit was carried out in a series of «Bologna» seminars. From the Tuning perspective, the most significant were those organised by the Irish presidency on the relationship between Vocational Education and Training and Higher Education, by the British authorities about the role of learning outcomes and by the government of Latvia and the Council of Europe on the recognition of studies. Tuning was invited to address all of these seminars.

Another major step forward after the Berlin meeting is the work done by the European Association for Quality Assurance in Higher Education —in close cooperation with EUA, EURASHE and ESIB— with regard to the development of an agreed set of standards, procedures and guidelines on quality assurance. ENQA published its report, *Standards and Guidelines for Quality Assurance in the European Higher Education Area*, in February 2005. It has been endorsed by EUA, EURASHE and ESIB and adopted by the European ministers at their summit in Bergen. This report focuses both on standards for internal and external quality assurance. It offers valuable reference points for the development of a quality culture within institutions. In this field the European University Association has also made an important contribution with their quality culture project. Here again the work done by Tuning complements these efforts by concentrating on quality in programme development and delivery.

Though the Bologna process began in a purely European frame of reference, it is now drawing increasing attention from other parts of the world as well. The desire for information and the interest of Universities from other continents has certainly enhanced the attractiveness of European higher education. Tuning too has been the object of great interest in many different countries throughout the world. In Tuning II a first broadening of participation took place with the inclusion of new and potential member states in the project. Subsequently, initiatives have been developed to include also the Tempus-Tacis countries. A number of these countries, including the Ukraine, have now been incorporated in the third phase of Tuning (2005-2006). Interest has been manifested in other parts of the world including the Russian Federation, Japan, Canada, India and Australia.

A major development in this respect is *Tuning América Latina*, a Tuning project for Latin America. This project has been set up by key European and Latin American Universities in close cooperation with the Ministries of Education and Rectors Conferences of 18 Latin American countries, and is now in operation as an Alfa EuropeAid-project of the European Commission. At present, 62 selected Latin American Universities are participating in this project. This number will grow to 182 in the near future. With this project Tuning faces the challenge of demonstrating its capacity to integrate fully the richness of all the countries and the institutions involved. The success of Tuning América Latina will give Tuning reference points a global dimension.

In this world context, Erasmus Mundus, a European Commission initiative, should be mentioned. Like Tuning, Erasmus Mundus focuses on degree programmes, in its case particularly on masters' programmes. As «flagships of Europe», Erasmus Mundus masters' programmes must have, as their first requirement, high quality in design and delivery. This requires joint development of degree profiles and agreement of all partners with respect to learning outcomes and competences and the allocation of workloads as well as in learning, teaching and assessment approaches. A particular requirement of Erasmus Mundus programmes is smooth and complete recognition. Here European and international reference points and standards have an important role to play.

Tuning's activities and findings contribute to the major process of reorientation taking place in higher education, from a staff-oriented input-based approach to a more student-centred approach, based on «output», that is, on the results to be obtained by the student at completion of a learning experience. In the second phase of the Tuning project, emphasis has been placed on the role of both academic staff and students in the new context, focussing on student workload, approaches to learning, teaching and assessment and quality enhancement of degree programmes.

A student-centred approach, focussing on what a student should know and be able to do after a period of learning, requires a change in the roles of academic staff and students with respect to traditional academic understanding. In a student-centred system, students themselves too must adopt a more active attitude. In practice an appropriate balance between subject specific and generic competences needs to be found, and ways of fostering their development must be consolidated. As part of this change of paradigm, we may observe that in recent years the usefulness of taking generic competences into account in the design and delivery of degree programmes has been increasingly recognised. There are different schools of thought regarding the most effective way to form, foster and measure generic competences. In this context, Tuning has concluded that the best results can be obtained by integrating teaching/learning activities aimed at forming the generic competences into the learning process connected to the subject specific competences. Only for a very limited number of generic competences and in certain subject areas might it be useful to set up separate courses, specifically aimed at forming one or more of the generic competences. In general it can be said that for generic competences to be formed a field of knowledge constitutes the necessary context and support. In Tuning II much thought has been devoted to examining how competences can be learned, taught and assessed.

Towards the future

In the Bergen Communiqué the European ministers responsible for higher education confirm the responsibilities and the critical role of Universities in the following words:

> «We underline the central role of higher education institutions, their staff and students as partners in the Bergen Process. Their role in the implementation of the Process becomes all the more important now that the necessary legislative reforms are largely in place, and we encourage them to continue and intensify their efforts to establish the EHEA. We welcome a clear commitment of higher education institutions across Europe to the Process, and we recognise that time is needed to optimise the impact of structural change on curricula and thus ensure the introduction of the innovative teaching and learning processes that Europe needs.»

The ministers also stress the importance of cooperation between the higher education sector and employers, social partners and other stakeholders. This emphasises the importance of consultation which has been one of the features of the Tuning project. This is also the case with regard to the relevance of the project to the three action lines for stocktaking towards the next summit which is scheduled for 2007: the degree system, quality assurance and recognition of degrees and study periods.

In another important publication, the Trends IV report, the crucial role of Universities also stands out. This report points out that the critical moment for the Bologna Process lies now with the implementation of curricula reforms at programme level. It stresses that there is a real need for information. Tuning is identified as the main source of information regarding curriculum development on the basis of the learning outcomes approach. It is also stated in the report that Tuning has a role to play in submitting best practices with respect to the assignment of credits to course units by assessing proper student workload.[1]

A recent European Commission communication also focuses on the importance of the Universities towards fully reaching the Lisbon Strategy to make Europe more competitive in the knowledge based society. This paper *Mobilisation of intellectual capital of Europe*, presents the state of the art of the European Universities in the global context and points to some of the ways ahead. Among the weak points identified, are fragmentation and isolation and lack of dialogue with the social and economic environment which makes the European Higher Education Area incomprehensible in a global setting. Another concern expressed in the communication is the tendency towards uniformity and overregulation which works against singularity and excellence.

These have been concerns of the Tuning membership from the start. That is why Tuning has searched for a balance between *common* language and points of reference which foster social and international understanding and facilitate recognition, and *diversity and autonomy*. The importance of diversity and autonomy is stressed in respect to different cultures, academic traditions, approaches towards teaching, learning and assessment, pathways to reach learning outcomes and competences and, furthermore, in degree profiles. Degree profiles, autonomous and diverse, are to be designed in a dialogue with all stakeholders. This is by nature a *dynamic* process.

It is expected that Tuning will be a useful tool for the future of the Bologna Process. Now, that the major Tuning action lines have been developed to a stage that they can be implemented, it is the time to disseminate the outcomes so that they can be used by all interested institutions, beyond the pilot groups. Of major significance in this third phase of the project is the joint work of Tuning, the Erasmus Thematic Networks and professional associations. This cooperation is highly

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[1] Sybille Reichert and Christian Tauch, *Trends IV: European Universities Implementing Bologna. An EUA Report* (Brussels 2005), p. 18 and 26.

enriching and is expected to be productive soon. Some twenty Thematic Networks are deeply involved at present in activities along the Tuning action lines. Concrete outcomes in terms of agreed competences, summary of outcomes and discussion documents are expected in the period 2005-2006. The Thematic Networks and associations will be of crucial importance in the series of conferences on Tuning issues which will also take place as part of Tuning III. European wide conferences are planned on Tuning issues: *Use of competences and learning outcomes in a three cycle system*, *Recognition of degrees and periods of studies*, *ECTS-credits and student workload in the Bologna framework*, *Approaches to teaching, learning and assessment* and *Quality enhancement at programme level*. These conferences are intended to bring the Tuning pilot project results in the public debate, to validate and develop them further, and to prepare them for implementation.

This book

The present volume is divided into two parts. The first summarises the Tuning 2 results focussing on issues of curriculum design development and delivery.

The first chapter gives an overview of the aims and objectives of the Tuning project in general and of Tuning 2 in particular. It also contains an explanation of the Tuning methodology.

In the second chapter the reader will find a series of nine «templates» or «Summaries of Outcomes», containing synthetic indications within a common format on the findings of the participating subject areas. The templates form has been created in order to facilitate access to the project's findings for all interested parties, including those who do not have particular knowledge of each subject area. In the future we expect that further templates will become available for a range of other subject areas.

The third chapter, entitled Curricula Design and Delivery, addresses a number of significant issues in building and running high quality study programmes. The first part of the chapter is devoted to the relationship between ECTS credits, learning outcomes and student workload. Tuning has developed an approach for determining student workload in Higher Education programmes. The chapter includes examples of good practice for a series of degree programmes as well as planning forms to help estimate student workload. The second part of the chapter is devoted to the central issue of how to link desired learning outcomes, formulated in terms of competences, to the most effective approaches to learning, teaching and assessment. It is based on extensive work carried out by the members of Tuning subject area work groups. It offers a first view of the very significant and hopefully useful contribution of Tuning 2 in connecting concrete indications of teaching, learning and assessment methods and strategies to output based curriculum designs.

The fourth chapter focuses on quality enhancement in degree programmes. As stated above, the quest for more appropriate and effective ways to ensure quality enhancement has been an important reason for setting up the Tuning project. This chapter offers not only a theoretical description of the potential role of the Tuning methodology in the design, implementation and delivery of degree programmes and in the development of a quality culture, but it also offers a practical step by step approach to quality enhancement. The chapter is completed by examples of good practice, a list of key questions to be considered when designing or implementing degree programmes, and a model for curriculum evaluation.

The second part of the book contains background information on the project itself as well as some in depth materials for selected subjected areas. Analogous materials for the other subject areas are published on the Tuning website.

Finally let us draw the reader's attention to the material at the end of the book: the «Goldmine» —a list of useful Internet sites and bibliographical indications—, and a glossary of terms developed in the Tuning project.

In carrying out the Tuning project, the collaboration of numerous academics from nearly all European countries has been essential. A remarkable degree of talent, expertise, generosity, loyalty and commitment has distinguished the Tuning project. We owe great thanks to all the academics involved directly and indirectly in the work done. The «newcomers» in Tuning 2, members from new countries involved in the project as well as the Thematic Networks cooperating with Tuning, have greatly enriched the project both with their patrimony of knowledge and insight, and with their new questions and ideas. And naturally we thank those who have been involved from the very start in creating the project. They have shown tremendous commitment and imagination, finding new solutions and ways forward in an open and constructive dialogue. Both new and old members have shown that European academics have the calibre and the vision necessary to tackle vital issues at an international level. Today's global society requires this kind of vision and commitment.

This project would never have been possible without the dedication and the wisdom of the members of the Management Committee. They have been the pillars of the project, not only carrying great responsibility but also in channelling discussions and debate in a constructive and stimulating directions. They have shown their ability to build consensus and reach outcomes which will prove useful for European higher education institutions in general. In particular we want to thank Ann Katherine Isaacs for her support in editing this volume.

Gratitude is also owed to the members of the Task Forces and to numerous international organisations, particularly ENQA, EURASHE, ENIC/NARIC, ESIB and the EUA. ESIB and EUA especially have accompanied Tuning 2 along its entire path, offering valuable ideas and comments.

Our deep thanks go to the European Commission and especially to the Directorate General of Education and Culture, not only for its generous financial support but also for its moral support, its interest, its advice and its commitment.

Indispensable in running the project have been the project assistants, Ingrid van der Meer and Pablo Beneitone, and the ICT assistance of Maida Marty Maleta. It is they who in practice keep the project running. All members of Tuning highly appreciate their indispensable work. They have shown time and again their commitment and their profound understanding of the Tuning project.

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Robert Wagenaar (University of Groningen),
Tuning project co-ordinators.

Bilbao and Groningen, November 2005.

PART ONE

1

Tuning Objectives and Methodology

1.1. TUNING OBJECTIVES

General

The background and context of the Tuning project is the implementation of the Bologna Process at university level. The project aims to make study programmes comparable and compatible, to facilitate transparency and academic recognition at European level and to build trust between institutions by offering a methodology to assure and enhance the quality of study programmes. Tuning proposes and promotes output-oriented programmes based on learning outcomes expressed in terms of generic and subject-specific competences as well as ECTS workload-based credits.

The Tuning project focuses not on educational *systems*, but on educational *structures* and *content* of studies. Whereas educational systems are primarily the responsibility of governments, educational structures and content are that of higher education institutions and academics.

As a result of the Bologna Declaration the educational systems in most European countries are in the process of being reformed. This is the direct effect of the political decision to achieve convergence of the different national systems in Europe. For Higher Education institutions these reforms in their turn constitute the starting point for another discussion: the *tuning* of curricula in terms of structures, degree programmes and approaches to teaching, learning and assessment.

More specifically, the project aims at *identifying reference points for generic and subject-specific competences* for first and second cycle graduates in a series of subject areas. At first, this was accomplished in the subject areas of Business Administration, Chemistry, Earth Sciences

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(Geology), Education Sciences, History, Mathematics and Physics; subsequently, as part of the second phase of Tuning (2003-2004), in the subject areas of European Studies and Nursing. At the same time many European Thematic Networks have also started to describe their field in terms of reference points. This overall process is promoted by the European Commission.

The name *Tuning* has been chosen for the project in order to express the idea that universities are not attempting «harmonisation» of their degree programmes or planning to implement any sort of unified, prescriptive or definitive European curricula; rather they are interested in establishing reference points, and encouraging convergence and common understanding. The protection of the rich diversity of European education has been paramount in the Tuning project from the very start and the project in no way seeks to restrict the independence of academic and subject specialists, or damage local and national academic authority.

Phase II

The first aim of phase II of the Tuning Project was to develop further approaches regarding teaching and learning and assessment and to linkup Tuning outcomes with quality assurance and enhancement. Furthermore, the methodology and results of the lines 1 to 3 —on the role of generic and subject specific competences and the use of ECTS as an accumulation system— were to be updated and refined.

As participants in phase I of the Tuning Project mainly universities in the traditional sense were selected. This was done for two reasons: 1) to achieve a good match with the chosen subject areas and 2) to have a comparable type of institutions in the different countries. Well-mapped subject areas from scientific fields were chosen to avoid further complication of the project. It was expected that the benchmarking of professional profiles and desired outcomes, in terms of knowledge, understanding, skills and abilities would be easier for this type of disciplines. When this approach proved to be successful, a new challenge was to apply the Tuning outcomes in other types of subject areas.

Therefore, the second major task of the second phase of the project was the implementation of the Tuning methodology to two new subject areas: an interdisciplinary programme, for which European Studies was selected, and an applied science, for which Nursing was chosen. These two fields served as examples for comparable types of subject areas.

In Tuning I only higher education institutions from EU and EFTA countries participated in the programme. A third important task of Tuning

II was to extend the project to the new EC member and candidate countries. Therefore, the existing Inner circle of 100 institutions was enlarged with another 35 institutions of which some 20 came from Central European countries.

Besides these three main purposes of the project, another achievement of phase I was further developed in phase 2: the offering of a platform for the exchange of experience and knowledge between countries, higher education institutions and staff with regard to the implementation of the Bologna process on a Europe-wide level. This included the further development and implementation of the European Credit Transfer and Accumulation system (ECTS) on the basis of described learning outcomes expressed in terms of competences.

The **main aims and objectives** of the Tuning II project can be summarised as follows:

- —To fine-tune and to develop further the outcomes of the Tuning phase I Pilot Project. This in particular with regard to the identification of commonly accepted and understood transferable skills and the identification of common denominators regarding knowledge, content, and subject related skills;
- —To test the use of the European Credit Transfer and Accumulation System as a basis for constructing and modifying curricula with as its starting point commonly agreed competences and learning outcomes;
- —To fine-tune the general methodology for measuring workload developed as part of phase I of the Tuning project, to make this methodology operational and to test it at the level of subject areas;
- —To fine-tune the level descriptors of the subject areas of Business, Chemistry, Earth Sciences (Geology), Education Sciences, History, Mathematics and Physics for the first and the second cycle;
- —To stimulate further a high level of Europe-wide convergence in Higher Education in at least the subject areas Business, Chemistry, Earth Sciences (Geology), Education Sciences, History, Mathematics and Physics: by developing common curricula structures on the basis of agreed learning outcomes and competences, enhancing in this way the recognition and European integration of diplomas;
- —To identify and develop different approaches regarding teaching and learning and assessment and performance within the framework of curriculum construction and learning outcomes and competences;
- —To link-up Tuning outcomes with quality assurance and assessment;
- —To reflect on Tuning outcomes with professional bodies;

— To develop degree profiles, commonly accepted lists of competences and learning outcomes, in terms of knowledge, content and skills in two new areas: Nursing and European Studies;
— To create two new European networks in the field of interdisciplinary studies (European Studies) and in the field of applied sciences (Nursing) that can present examples of good practice, encouraging innovation and quality in the joint reflection and exchange, for comparable fields as well;
— To associate all existing thematic networks by offering the outcomes and experience of the Tuning Pilot project for testing and development within these networks;
— To facilitate transparency in educational structures and to further innovation through communication of experience and identification of good practice;
— To open the Tuning process to more applied universities and to institutions in the accession countries;
— To build bridges between the universities involved, the European University Association, the national Rector's Conferences and other appropriate qualified bodies, in particular professional organisations and quality assurance agencies, in order to produce convergence in higher education teaching;
— To act in a co-ordinated manner with all the actors involved in the process of tuning of educational structures, in particular the Bologna follow-up group, Ministries of Education, Conferences of Rectors (including the EUA), Quality Assurance Organisations and Accreditation Bodies, ENIC-NARIC, as well as Universities.

1.2. TUNING METHODOLOGY

TUNING MOTTO:
Tuning of educational structures and programmes on the basis of diversity and autonomy

In the framework of the Tuning project a methodology has been designed to understand curricula and to make them comparable. Five lines of approach have been distinguished to organize the discussions in the subject areas:

1) generic (general academic) competences,
2) subject-specific competences,
3) the role of ECTS as an accumulation system

4) approaches to learning, teaching, and assessment and
5) the role of quality enhancement in the educational process (empha+sizing systems based on internal institutional quality culture).

In the first phase of the Tuning project the emphasis was on the first three lines. The fourth and fifth lines received less attention due to time constraints, but they had a central place in the second phase of the project (2003-2004).

Each line has been developed according to a pre-defined process. The starting point was updated information about the state of the art at European level. This information was then reflected upon and discussed by teams of experts in the now nine subject related areas. It is the work of these teams, validated by the respective European networks, that has provided understanding, context and conclusions which can be considered valid at European level. All together, the five lines of approach allow universities to «*tune*» their curricula without losing their autonomy and at the same time stimulate their capacity to innovate.

Tuning model

Furthermore Tuning developed a model for designing, implementing and delivering curricula offered within one institution, or, jointly, by two or more institutions. The following main steps in the process for designing a study programme either a local programme or an (international) integrated programme / joint degree were identified:

1. Meeting the basic conditions:

   For all study programmes:

   — Has the social need for the programme on a regional/national/ European level been identified? Has this been done on the basis of a consultation of stakeholders: employers, professionals and professional bodies?
   — Is the programme of sufficient interest from the academic point of view? Have common reference points been identified?
   — Are the necessary resources for the programme available inside or, if required, outside the (partner) institution(s) concerned?

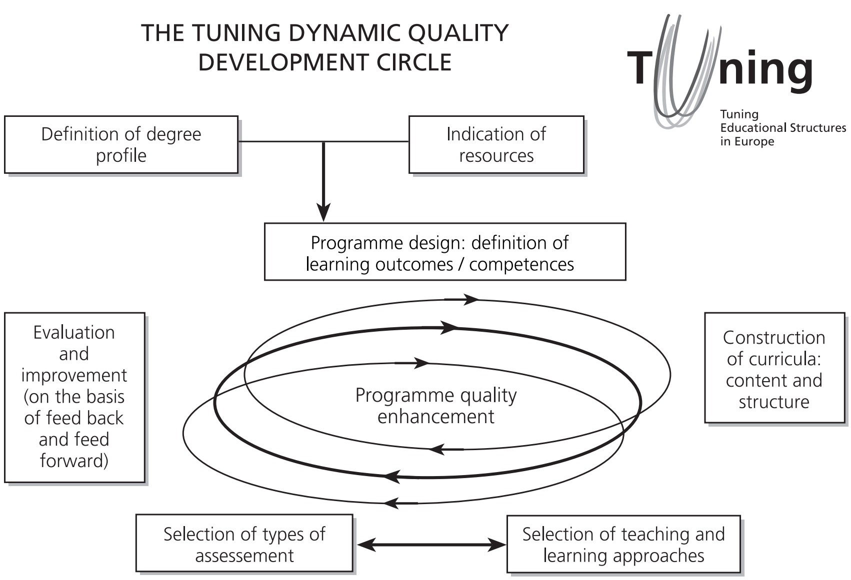
   For international degree programmes offered by more than one institution:

   — Is there commitment of the institutions concerned? On what basis: an (official) agreement or a strategic alliance?

—Is there sufficient guarantee that the programme will be recognised legally in the different countries?
—Is there agreement with regard to the length of the programme to be designed in terms of ECTS-credits based on student workload?

2. Definition of a degree profile.
3. Description of the objectives of the programme as well as the learning outcomes (in terms of knowledge, understanding, skills and abilities) that have to be met.
4. Identification of the generic and subject-related competences which should be obtained in the programme.
5. Translation into the curriculum: content (topics to be covered) and structure (modules and credits)
6. Translation into educational units and activities to achieve the defined learning outcomes.
7. Deciding the approaches to teaching and learning (types of methods, techniques and formats), as well as the methods of assessment (when required, the development of teaching material)
8. Development of an evaluation system intended to enhance its quality constantly.

This process is reflected in the following flow chart:



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This model is based on the assumption that programmes can and should be enhanced on the basis not only of feedback but also of «feedforward» by taking into account developments in society as well as the academic field concerned. This is illustrated by the progressive loops in the model.

ECTS

One of the main innovations of Tuning has been to link learning outcomes,, competences and ECTS workload based credits. As part of Tuning I it was necessary to develop a new concept for ECTS. This concept implies the change of the European Credit Transfer System into a European Credit Transfer and Accumulation System, in which credits no longer have a relative value but have an absolute one and are linked to learning outcomes. In the new ECTS system the award of credits depends on full achievement of the desired learning outcomes for a unit or module. The philosophy as well as its features are reflected in the paper *Educational Structures, Learning Outcomes, Workload and the Calculation of ECTS Credits,* which formed the basis for the new ECTS Users' Guide published by the European Commission in the summer of 2004[2]

Learning outcomes and competences

The introduction of a two or three cycle system makes it necessary to revise all existing study programmes which are not based on the concept of cycles. In practice these programmes have to be redesigned because in a cycle system each cycle should be seen as an entity in itself. The first two cycles should not only give access to the following cycle but also to the labour market. This shows the relevance of using the concept of competences as a basis for learning outcomes.

Tuning makes the distinction between learning outcomes and competences to distinguish the different roles of the most relevant players: academic staff and students/learners. Desired learning outcomes of a process of learning are formulated by the academic staff, preferably involving student representatives in the process, on the basis of input of internal and external stakeholders. Competences are obtained or

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[2] ECTS Users' Guide: http://europa.eu.int/comm/education/socrates ects.html.

developed during the process of learning by the student/learner. In other words:

— Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of learning. They can refer to a single course unit or module or else to a period of studies, for example, a first or a second cycle programme. Learning outcomes specify the requirements for award of credit.
— Competences represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering competences is the object of educational programmes. Competences will be formed in various course units and assessed at different stages.

Competences can be distinguished in subject specific and generic ones. Although Tuning acknowledges to the full the importance of building-up and developing subject specific knowledge and skills as the basis for university degree programmes, it has highlighted the fact that time and attention should also be devoted to the development of generic competences or transferable skills. This last component is becoming more and more relevant for preparing students well for their future role in society in terms of employability and citizenship.

Tuning distinguishes three types of generic competences:

— Instrumental competences: cognitive abilities, methodological abilities, technological abilities and linguistic abilities;
— Interpersonal competences: individual abilities like social skills (social interaction and co-operation);
— Systemic competences: abilities and skills concerning whole systems (combination of understanding, sensibility and knowledge; prior acquisition of instrumental and interpersonal competences required).

As part of Tuning I, a large scale consultation was organized among graduates, employers and academics to identify the most important generic competences for each of the academic fields involved. Although the set of most relevant generic competences differed slightly between the different subject areas, for most competences there was a striking similarity between the fields. In all fields typical academic competences were identified as being the most important ones, like the capacity for analysis and synthesis, the capacity to learn and problem solving. In particular the graduates and employers, who proved to be remarkably in agreement, showed that other generic competences as well were seen as being very important for employability, like the capacity for applying knowledge in practice, the capacity to adopt to new situations, concern for quality, information management skills, ability to work autonomously, team work, capacity for organizing and planning, oral and written communication in your native language as well as interpersonal skills. It was also concluded by graduates and employers that some of the competences mentioned above were of more use and developed to a higher level than others. They drew attention to the fact that more attention should be given to a specific number of generic competences to prepare students better for their future workplace. The outcome of this extended consultation process can be found in the publication which resulted from the Tuning I project as well as on the Tuning website.

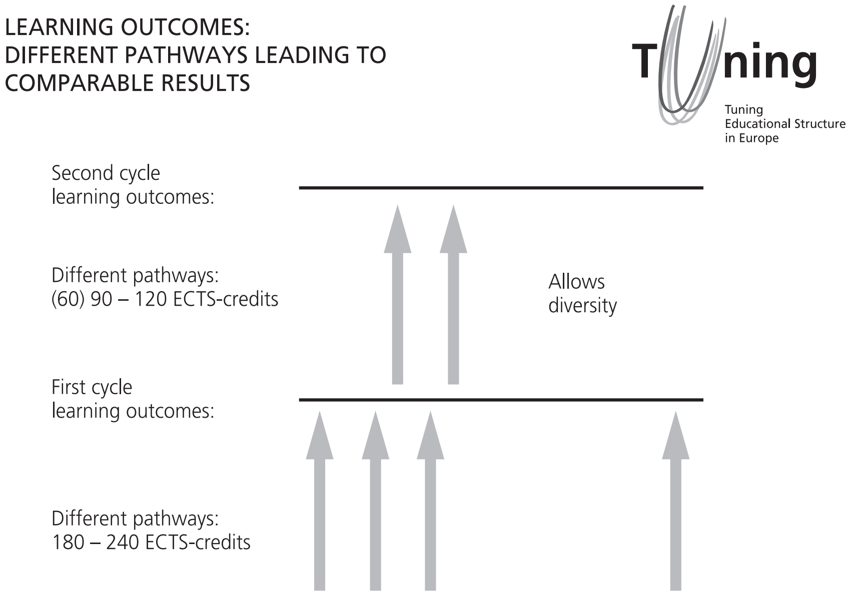
Subject specific competences have been identified already for nine subject areas e.g. Business Administration, Chemistry, Education Sciences, European Studies, History, Geology (Earth Sciences), Mathematics, Nursing and Physics. These sets of competences are reflected in documents prepared by each of the nine subject area groups of the project.[3] As already stated in the introduction to this book the approaches of the nine groups differed, because of differences in the structure of the disciplines; nonetheless, all groups followed a similar procedure to obtain their results. Through discussion, creation of reciprocal knowledge and mapping the ways the subject area is learned and taught in the various countries, insight was gained and consensus built on what constitutes the vital core of each subject area. The documents which resulted should be understood to be working documents, subject to further elaboration and change.

In Tuning competences are described as *reference points* for curriculum design and evaluation, not as straightjackets. They allow flexibility and autonomy in the construction of curricula. At the same time, they provide a *common language* for describing what curricula are aiming at.

The use of learning outcomes allows for much more flexibility than is the case in more traditionally designed study programmes, because they show that different pathways can lead to comparable outcomes; outcomes which can be much more easily recognized as part of another programme or as the basis for entrance to a next cycle programme. Their use fully respects the autonomy of other institutions as well as other educational cultures. Therefore this approach allows for diversity, not only in a global, European, national or institutional framework, but also in the context of a single programme. This concept is summarized in the following scheme:

[3] These papers can be found on the Tuning Website as well as in the first Tuning book.

LEARNING OUTCOMES:
DIFFERENT PATHWAYS LEADING TO
COMPARABLE RESULTS

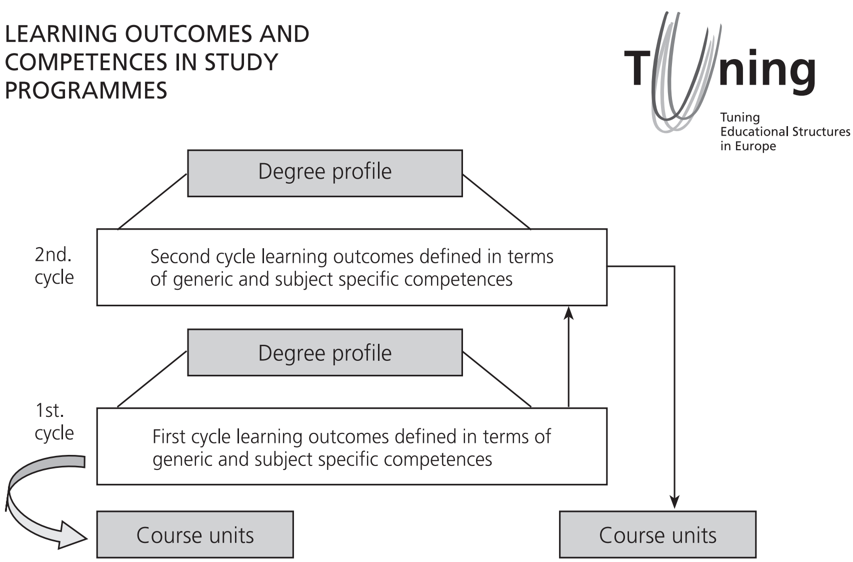


Student centred

The use of learning outcomes and competences is necessary in order to make study programmes and their course units or modules student centred / output oriented. This approach requires that the key knowledge and skills that a student needs to achieve during the learning process determine the content of the study programme. Learning outcomes and competences focus on the requirements both of the discipline and of society in terms of preparing for citizenship and employability. Still today, many study programmes are staff centred, which means in practice that they are input oriented. They often reflect a combination of the fields of interest and expertise of the members of staff. In effect this leads to programmes of rather loose units which might not be sufficiently balanced and most effective. Although Tuning recognizes fully the importance of making maximum use of the available expertise of the staff, this aspect should not dominate a programme.

In an output based study programme the main emphasis lies on the degree or qualification profile. This profile is determined by the academic staff and endorsed by the responsible authorities. The profile should be based on an identified and recognized need by society —in practice internal stakeholders, that is the academic society, as well as external stakeholders like employers (organizations), graduates and professional organisations. All have their place in deciding which competences, generic and subject-specific, need to be emphasised and to what extent. Although every programme profile is unique and based on the judgements and decisions of the academic staff, this staff has to take into account specific features which are seen as being crucial for the subject area concerned. In other words: what makes a business programme a business programme. In the framework of Tuning groups of academics have defined these sets of features for their own discipline. These are reflected in so-called Templates, or Summaries of Outcomes containing synthetic indications within a common format, which are based on more extensive papers.

In a cycle system each cycle should have its own set of learning outcomes formulated in terms of competences. This can be visualized using the following scheme:



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As stated before, learning outcomes are formulated both at programme level and on the level of individual course units or modules. The learning outcomes of the individual units add to the overall learning outcomes of the programme. The situation for the competences to be acquired is more or less comparable. Competences are developed in a progressive way. This means that they are formed in a number of course units or modules at different stages of the programme. During the design phase of the programme it has to be decided in which units a particular competence has to be formed. Depending on the size of a unit or module Tuning is convinced that it is advisable not to include more than six to eight competences in the learning outcomes for that unit. Although there might be competences which can be trained implicitly in a programme, only competences which can actually be assessed should be mentioned explicitly. The following scheme shows a possible approach for dividing competences over course units or modules.

LEARNING OUTCOMES AND COMPETENCES IN STUDY PROGRAMMES

Tuning
Tuning Educational Structures in Europe

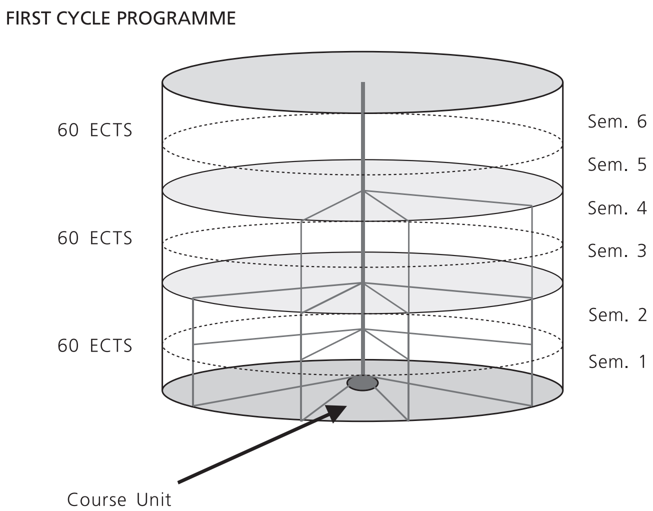
Example

Course unit/ learning outcome	Competence									
	A	B	C	D	E	F	G	H	I	J
Unit 1		X			X					
Unit 2	X			X			X			
Unit 3		X				X			X	
Unit 4	X		X							X

(X: This competence is developed and assessed and is mentioned in the learning outcomes of this Unit)

As has been shown above, for Tuning, a study programme is not a summing-up of a number of loosely related course units; it must be handled as an entity in itself. This requires a more holistic approach. In a student centred- / output-oriented study programme, all units in one way or another are related to each other. This not only applies to the units or modules which are part of the major or the core part of the programme, but also to minor courses and electives. In a well designed programme, minors and electives should strengthen the profile of the programme.

In the vision of Tuning a study programme can be seen as a large cake, with different levels, in which all slices are linked to one other, either in a horizontal or in a vertical way. In more formal educational terms: the learning outcomes of the individual units or modules add to the overall learning outcomes and to the development of the level of competences, taking into full consideration the learning outcomes to be achieved in other units. This concept can be visualized in a more schematic form as the following model shows:



The model presumes progression regarding the achievement of learning outcomes expressed in terms of competences. Each course unit has a role in the overall curriculum. It distinguishes three periods of 60 credits which again are subdivided into two. This is the more traditional way a programme is taken: semester by semester. However, it also shows that other options are possible. For example a student can study one part of a programme in greater depth, by taking two units (or slices) in a vertical way if the prerequisites (entrance conditions) of this unit allow this. One can imagine that a student studying a language will focus first on language acquisition and will then concentrate on either literature or linguistics, although the official order of the programme might be different. It also shows that separate units, followed successfully in another context, can be fitted into the study programme on the basis of prior recognition. In a life long learning context and in more flexible programmes this might be very relevant.

One of the main objectives of the Bologna process is to make study programmes and periods of learning more comparable and compatible. This objective is strongly promoted by making use of the concept of levels, learning outcomes, competences and ECTS credits. A further way to promote this aim is to base study programmes on units of equal size. Modularization of educational programmes will promote transparency, and will facilitate mobility and recognition. It may also help to make programmes more feasible to study, because it offers an instrument to balance the student workload over the different phases of the programme.

Levels

The use of cycles automatically includes the introduction of the concept of levels. A distinction can be made between levels for a cycle and levels within a cycle. For each of these level indicators can be used. They are called *level descriptors.* As part of the Bologna Process, a group of experts, the so-called Joint Quality Initiative, has developed sets of general descriptors for each cycle, which are called the Dublin descriptors. These cycle descriptors have now been endorsed by the European Ministers of Education as part of the report *A Framework for Qualifications of The European Higher Education Area*. The approaches of Tuning and the JQF are fully compatible and complementary.

Because cycle descriptors in practice are level descriptors which identify the level of a cycle, Tuning has suggested naming these descriptors *cycle level descriptors,* to distinguish them from *intermediate or sublevel descriptors.* Tuning has produced cycle level descriptors at programme level for the first and second cycle for each of the subject areas included in the project. It has also debated the possibility of developing sublevel descriptors but has not yet come to a final conclusion. One can imagine, for example, that the following sublevels can be distinguished in university first cycle programmes: basic or fundamental, intermediate and advanced. For a second cycle programme a distinction might be made between the sublevels: advanced and specialized.

Prepared by Julia González and Robert Wagenaar

2

Subject areas and degree profiles in the Bologna Process

2.1. THE *TUNING* TEMPLATE

In order to facilitate readability and rapid comparison across subject areas, a template has been developed to serve as an outline for a summary of the outcomes of each subject area. These summaries aim to provide, in a very succinct manner, the basic elements for a quick introduction into a subject area.

Each summary shows in synthesis the consensus reached by a subject area group after intense and lively discussions. Each is based on much more ample documents which reflect a more detailed overview of the elaborations of the subject area groups. These documents —after validation— are intended to be the common reference points for each of the academic subject areas.

The template gives information about the following issues:

— Introduction to the subject area.
— Degree profiles and occupations.
— Learning outcomes and competences: cycle level descriptors.
— Workload and ECTS.

It also gives examples of good practice for:

— Learning, teaching en assessment.
— Quality enhancement.

The introduction of a subject area positions the subject area in the European field of higher education. It shows the specificity and the main coordinates for the understanding of a particular subject area. It offers context and background.

The template intends to cover the mainstream profile for a subject area, while in no way denying the importance of diversity in the design of degree profiles. The development of a degree profile takes place in the initial stages of the planning for a degree programme. It relates to the need and potential which has been identified. In the EHEA it could be anticipated that there will be no two profiles which are the same. There is not one single way of answering a need for a degree programme, nor even of perceiving it. This is a sign of variety and innovation and it is important that variety is enhanced. The design, the development and the writing of a degree profile is the moment to determine the combination of elements which will give to a particular degree its specific mark. The latter is an interesting mixture of elements whereby the graduates of a particular department, university or degree will be identified.

When a new field of knowledge appears degree profiles can be regarded as totally innovative. In such a case disciplinary references are sometimes very slight, because such degrees are often interdisciplinary or multidisciplinary in nature. However, degree programmes which already exist have normally proven their necessity for the development of society. With regard to those degree programmes as well, it continues to be the responsibility of the higher education institutions to educate citizens in the most effective manner, taking into account developments in both society and in the subject area. In any case it is useful and according to Tuning necessary that every study programme be based on a well considered and well described degree profile which is continuously subject to reflection and updating.

Tuning has found that in the fast majority of academic fields, second cycle degree profiles tend to be more diverse than first cycle profiles. This is not surprising since the second cycle is the period of specialization and it often reflects the particular expertise of the university concerned. Sometimes, these degrees are referred to as having a generalist or specific profile, a research profile or a professional profile etc. Tuning believes that this variety is to be kept:

- —provided it is articulated in a consistent manner at country and at subject area level and
- —provided that with the adequate tools for transparency the differences between profiles? can be identified and recognition is made possible.

In general (first and second cycle) degree profiles guide the choice of learning outcomes defined and competences developed in a study

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programme. The higher education institution/department may have specific strengths or policies based on a particular vision of the importance of educating a particular type of professional. In this sense the degree programme will have an identity mark referring to the place where the degrees were granted. Degree profiles show that the combination of learning outcomes and competences have particular features which distinguish them from other degree profiles.

There are elements in the profile that relate in a generic manner to other degrees in the same cycle level in the European Framework of Qualifications. A way to identify these elements is by using the so-called Dublin descriptors, which are built on five elements which distinguishe levels of competences of:

—knowledge and understanding;
—applying knowledge and understanding (to move from theory into academic practice)
—making informed judgements;,
—communication skills;
—learning skills for further study.

This is the contribution of the EFQ, while Tuning provides the disciplinary context and articulation of these elements and levels.

As said the degree profile is translated into learning outcomes and competences, which constitute the hard core of a degree's identity. The learning outcomes and competences are crucial for recognition. Tuning has pointed to the fact that in an ever changing society, with high mobility in employment, generic or transferable competences are of great significance and every degree profile should make choices in relation to the most suitable ones in relation to the desired outcome of the programme. Tuning consulted graduates, employers and academics in a structured way to identify the most relevant generic competences. Each subject area group agreed on the set of the most important generic competences for its field. What also became clear was that the consultation process regarding generic competences —e.g. the capacity for analysis and synthesis, problem solving ability, etc.— showed interesting variations when they were applied to different areas such as Physics, History or Law.

In particular the subject related learning outcomes and competences (knowledge, understanding, skills and abilities) should have a clear impact on the curriculum. Again here is plenty of room for variety of paths and learning situations taking into consideration that these need to be consistent with the degree profile and have an acceptable level of reference to what the academic community, in dialogue with the professional bodies, considers the «common», «identifying» elements.

This minimum core will make a degree of mathematics identifiable, just as it will make a degree in nursing recognisable.

After intensive sessions of discussion based on careful listening to each other and understanding different approaches, the Tuning subject area groups were able to reach consensus with regard to what a student should know, understand and be able to do in terms of key learning outcomes to be achieved and key competences to be obtained by the learner: crucial elements for recognition. Tuning offers a number of agreed learning outcomes and competences for a growing number of subject areas. They are presented as reference points for the definition of the identity core in order to facilitate comparability and recognition.

A further element of analysis is the reference to ECTS credits based on student workload. Tuning is convinced that defining a profile and agreeing on the learning outcomes of a degree programme as such is not sufficient. It is seen as an absolute necessity that the volume and weight of the programme correspond to the time available for the students to reach the learning outcomes. In other words a programme of learning must be feasible within the given timeframe. The use of ECTS credits not only guarantees this overall feasibility but also facilitates the balance of the programme by linking desired outcomes with the weight given to the different elements of the programme.

Finally, in most cases reference is made in the template to approaches to learning, teaching and assessment and quality enhancement. Teaching, learning and assessment methods and techniques are important pointers in the process of learning. They may affect the specificity of a particular degree programme in the sense that nature and length of the educational experiences can have an impact on the type of degree or even on its duration. Also the reference to quality enhancement provides a dimension of the programme which has to be considered. The notion of quality assurance should be present during the whole process of designing, developing and implementing of a degree programme.

To summarise: In the template degree profiles are limited to the typical degree of a concrete subject area. This is reflected in the learning outcomes expressed in terms of competences. They should only be seen as reference points. The ECTS credits show the amount of time that would typically be required to meet the desired learning outcomes. The item on learning, teaching and assessment provides space for reflection and programming, considering the best routes to attain the aims. Quality enhancement is mentioned in the template to raise the awareness of important developments in the field and to point to the importance of considering how the consistency of the process can be guaranteed and internally checked.

ANNEX

Template for summary of Tuning subject area findings: [Name of Subject Area]

[8-12 pages in total]

1. **Introduction to the subject area**

A general description of the subject area and its key characteristics: is it understood in the same way in all European countries or are there relevant differences; are there any other particular aspects that should be mentioned in an overview.

2. **Degree profile(s)**

[in table form]

Typical degrees offered in the subject area

— First cycle in (name subject area / specific parts).
— Second cycle in (name subject area / specific parts).
— Third cycle in (name subject area / specific parts).

Typical occupations of the graduates in the subject area (map of professions)

— First cycle.
— Second cycle.
— Third cycle.

Role of subject area in other degree programmes
Which programmes and in what way.

3. **Learning outcomes & competences - level cycle descriptors**
[in table form]

— First cycle (subject specific and generic).
— Second cycle (subject specific and generic).
— Third cycle (subject specific and generic.

Which are the main learning outcomes expressed in the relevant subject specific and generic competences (from the Tuning list of generic competences) for the different cycles, taking into account the level of the competence (what the graduate knows and is able to do) that has to be achieved.
Consultation process with stakeholders.

4. **Workload and ECTS**

Workload of the typical degree programmes expressed in ECTS-credits:

— First cycle (180-240?).
— Second cycle (60-90-120?).
— Third cycle (120-180-240?).

Trends and differences within the European higher education area in this subject area.

5. **Learning, teaching & assessment**

Three example of best practice in learning, teaching and assessment to achieve competences relevant to the subject area.

6. **Quality enhancement**

Subject area related observations on the use of Tuning tools in programme design, delivery, monitoring and improvement.

2.2. SUMMARY OF SUBJECT AREA FINDINGS

Tuning promotes the determination of key features for every subject area. As part of the project a so-called summary of outcomes have been developed for:

- Business Administration.
- Chemistry.
- Earth Sciences (Geology).
- Education Science.
- European Studies.
- History.
- Mathematics.
- Nursing.
- Physics.

These can be found on the following pages as well as on the Tuning website.

2.2.1. **Business Administration**

1. ***Introduction and Background***

As there is a great diversity in the ways in which business programmes can be —and have been— designed, it is difficult to come up with one single standard for the aims, contents and subject specific competences that are to be achieved at first and second cycle business programmes around Europe. However, there does exist a number of similarities in European institutions regarding aims, contents and views on subject specific competences in first cycle programmes, whereas opinions differ more at second cycle programmes. Third cycles have not been formally addressed because of even greater diversity.

In general, the characteristics of the work and the aims of a business organisation (private or public) can be described from many different perspectives. One of the most frequently used is identifying the basic function of a business organisation using a *value network perspective,* which then leads to the following primary functions of a business organisation:

- Procurement.
- Manufacturing product and/or services.
- Sale and marketing.
- Service before, during and after sale.

And in addition, a number of supportive functions such as design, development and maintenance of:

- Company infrastructure.
- Company structure and systems.
- Information systems.
- Human resource management.

Business graduates will mainly be involved in the economic, planning and human resource management aspects of a business organisation. From a general theoretical point of view this leads to a focus on the following generic abilities required in different types of organisations and within different subject areas to prepare graduates for an ever changing business environment:

Analysis implies abilities in identifying:

- The environment in which problem solving takes place.
- Assumptions and objectives for solution of problems.
- The resources and competences required to solve the problem.

Choice means for instance:

- Being able to make decisions.
- Being aware of the uncertainties and risks associated with making choices.
- Stating the implications and consequences of the choice made.
- Being able to argue and defend a choice.

Implementation requires abilities in:

- Planning and organising.
- Creating the right setting.
- Managing change.
- Argumentation and follow-up.
- Understanding and awareness.
- Leadership skills.

2. ***Degree profile(s) and occupations***

In term of competences, business programmes and courses may be characterised by the emphasis on the following 3 main categories of competences:

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1. Core-Knowledge courses.
2. Knowledge-deepening courses, with the possible orientations:

   —Vertical.
   —Horizontal.
   —Diverse.

3. Generic-skills courses (subject independent), divided into:

   —Instrumental competences.
   —Interpersonal competences.
   —System competences.

The priority of the 3 categories depends on the cycles.

Typical degrees offered in Business

Cycle	Typical degrees offered
First	Bachelor's degrees in business administration tend to give a general overview on main issues of company missions. This means that students are prepared through Core Knowledge and generic-skills courses (subject independent). Core Knowledge topics cover courses in Operations management/logistics; Sales and Marketing and Supportive functions represented by courses such as: Organisation; Human Resource Management; Finance and Accounting; General Management. Added to these general knowledge courses, we find Instrumental skills courses such as: Economics (micro and macro); Quantitative methods (mathematics, statistics, market research); Law (national and/or international); IT (separate or integrated into other courses). Added courses in developing competences in personal organisation and communication skills such as courses in language (separate or integrated into other courses) and courses in presentation/communication/teamwork (separate or integrated into other courses). At the end of first cycle; systemic skills (transferable) are documented by a bachelor's thesis, internship or activities documenting ability to solve problems across different business subject areas. A variety of bachelor's degree programmes exists with some degree of specialisation in the above-mentioned areas.

Cycle	*Typical degrees offered*
Second	Master's degrees normally tend to focus on Knowledge-deepening courses, with the possible orientations either in a vertical direction where students go in-depth in a subject area from the first cycle, or horizontally/intra-disciplinary meaning that students add new subject areas of business, or finally going diverse, which means including courses and topics not directly linked to business, for instance psychology or engineering. The master's programme normally holds a substantial thesis component, usually involving one or more business areas in a concrete business company. Second cycle holds a great variety of different programmes with different types of specialisation.
Third	PhD usually requires examination and defence of a substantial and original piece of research described in a comprehensive thesis.

Typical occupations of the graduates in Business(map of professions)

Cycle	**Occupations**
First	Mostly, a first cycle degree enables the graduates to hold positions in operations management/logistics; sale and marketing, organisation; human resource management; finance and accounting; in IT; different types of specialised analysis functions, normally at a trainee level in organisations.
Second and Third	Second cycle degree means that graduates are able to hold specialist positions in operations management/logistics; sale and marketing, organisation; human resource management; finance and accounting; strategic thinking and planning; in IT; different type of analyses, functions, sometimes in trainee jobs in both national and international organisations.

The role of Business in other degree programmes

Various subject areas related to Business are based on contributions from different scientific areas such as mathematics, statistics, psychology, engineering, IT and philosophy. On the other hand, a number of Business areas is related to or has an impact on other degree programmes. For instance subjects like Organisation and Human Resource Management will naturally be part of almost all positions held by graduates.

For this reason, it might be difficult to make a complete list with all relations from Business to other subject areas.

3. *Learning Outcomes and Competences - Cycle Level Descriptors*

<table>
<tr><th colspan="2">First Cycle</th></tr>
<tr><th>Key Subject Specific Competences</th><th>Key Generic Competences</th></tr>
<tr><td>Students should be able to:
—Use and evaluate tools for analysing a company in its environment.
—Work in a subject specific field of a company, and be a specialist to some extent.
—Interface with other functions.
—Have self-awareness.
—Be able to argue for the principles to be used in finding a solution to a problem mainly at an operational or tactical level.
—Defend the proposed solution.
—Prepare for decision making at mainly operational and tactical levels.</td><td>—Basic knowledge of the profession.
—Basic knowledge of the study field.
—Ability to work in interdisciplinary teams.
—Capacity to apply knowledge in practice.
—Ability to adopt to new situations.
—Elementary computer skills.
—Capacity to learn.
—Capacity to do oral and written presentation in native language.</td></tr>
<tr><th colspan="2">Second Cycle</th></tr>
<tr><th>Key Subject Specific Competences</th><th>Key Generic Competences</th></tr>
<tr><td>Students should have:
—First cycle competences.
—Skills enabling them to participate in strategic decision making.
—Ability to do guided research.
—Ability to work independently.
—Skills to perform holistic judgement and abilities to make critical assessments on strategic solutions.
—Skills to manage change.
—International mobility and cultural understanding.</td><td>—Capacity for analysis and synthesis.
—Problem solving.
—Self-critical abilities.
—Knowledge of a second language.</td></tr>
<tr><th colspan="2">Third Cycle</th></tr>
<tr><th>Key Subject Specific Competences</th><th>Key Generic Competences</th></tr>
<tr><td>Students should:
—Demonstrate the ability to perform independent, original and ultimately publishable research in one or more business or subject areas relating to business analysis, choice and implementation.</td><td>—Expert skills in a specific subject.
—Research skills.
—Creativity.
—Appreciation of diversity and multi-culture.
—Critical and self-critical abilities.</td></tr>
</table>

Consultation process with stakeholders

Business is focused on the value creation in public and private organisations. For this reason, it is natural that institutions with business programmes cooperate on education and research with these organisations, and a continuous consultation process with these main stakeholders takes place.

Regarding the intake of students, there does not seem to be much formalised consultation with the stakeholders supplying students to business programmes. However, there seems to be an increase in such cooperation.

4. ***Workload and ECTS***

Cycle	**ECTS Credits** (25-30 student working hours)
First	Mostly 180 and in few instances 240
Second	60, 90 or 120 (normally)
Third	Mostly a PhD programme with a duration of three years

Most European countries award a First Cycle Bachelors Degree after 180 ECTS. The first model is currently the most common. Some countries are in the process of changing their existing programmes to fit the «Bologna» Model. Different models exist for Second Cycle Master's Degrees awarded after 60, 90 or 120 ECTS.

5. ***Learning, Teaching and Assessment***

In order to establish whether an entire programme content is in accordance with the level descriptors, the expectations among stakeholders in terms of learning outcomes should be considered. It is recommended that higher educations view the abilities reached after completing a programme by including in their reflection whether the students in their learning process have acquired the abilities to formulate:

1. Background.
2. Research question.
3. Methodology.
4. Analyses.
5. Conclusion.
6. Recommendations.

7. Literature.
8. Presentation/language/communication.

when faced with a problem originating within a business context. These assessment criteria are the criteria often used by academics in the assessment of seminars, projects, thesis scientific papers etc.

Best practice

First cycle programmes should focus on general knowledge acquisition, in order to get students acquainted with the different business functions, the environment in which these functions are carried out in a company and their interrelationships. This is all the more necessary as the skills of the student intake vary a good deal. In order to achieve these teaching and learning goals, the student at the same time needs to become familiar with a number of basic supportive instruments, organisation and communications skills together with abilities to structure the problems of a business organisation. To reach these learning objectives at first cycle, students should experience different types of teaching methods, such as traditional lectures and exercises, seminars, project work and relatively simple practical cross-functional problems found in companies. Added and linked to this, students should experience a variety of assessment methods to document that learning outcomes have been achieved. This means that the learning objectives of a course should be matched with the appropriate teaching and assessment methods, where students document not only their basic knowledge level, but also their abilities to use supportive instruments, to organise their own work, and to communicate and argue for the results and recommendations. This means that institutions even at the first cycle should use a variety of assessment methods, especially assessment methods that enhance the students' organisation, communication and system competences. After first cycle, students are expected to have employability, mobility and life long learning.

The teaching at **second cycle** should be based on first cycle core knowledge. As to the direction, whether it should be vertical, horizontal or diverse, the group does not intend to give any recommendations, except that the direction should be based on knowledge acquired during the first cycle. At second cycle, just as at first cycle, a variety of teaching and assessment methods should be used, to stimulate not just knowledge acquisition in the subject field but also to prepare the students to find the relevant instruments to do problem solving, as well as to stimulate their abilities to organise and communicate, and finally to be able to present their solutions to a problem in a broad business organisation context.

6. *Quality Enhancement*

The quality dimensions are student centred and are:

- Mobility.
- Employability.
- Life Long Learning.

Methods: Design of higher business programmes with courses based on generic and subject-specific competences by means of:

- Contents.
- Delivery.
- Assessment.

Results:

- Learning outcomes expressed in term of generic and subject specific competences.
- Workload.
- ECTS linking learning outcomes with workload.

The main stakeholders to be involved in quality enhancement are:

- Academics.
- Current students.
- Graduates.
- Employers.

These stakeholders contribute with:

- Experiences.
- Knowledge.
- Demands/Needs/Wishes.

Main quality enhancement processes involving main stakeholders can be described in the following model:

$$\left.\begin{array}{l}\text{Dialogue on}\\ \text{Feedback on}\\ \text{Evaluations of}\end{array}\right\}\left\{\begin{array}{l}\text{Mobility}\\ \text{Employability}\\ \text{Life Long Learning}\end{array}\right.$$

2.2.2. **Chemistry**

1. ***Introduction to the subject area***

Chemistry is one of the basic scientific disciplines, along with physics and biology. It is thus a subject which is understood in the same way in all European countries, and indeed throughout the world. Until recently there would have been general agreement as to the way that chemical education at universities should be organised. Physics and mathematics are subjects which the chemist needs to study in the first year of chemistry education, since some aspects of these form a vital basis for understanding chemistry. Normally the physics and mathematics departments provide the necessary teaching, but it is sometimes found advantageous that chemists themselves teach these two subjects to the necessary level.

The relationship between chemistry and biology is more complex. Biology has traditionally been to a large extent a science of description and classification, but modern biology has moved away from this picture, and indeed biology education at universities is developing in many important directions.

A chemist will often say that «modern biology is chemistry» because so much of modern biology is studied and described at the molecular level. Thus the biologist needs to know much more chemistry than before, and from the point of view of the chemist he or she needs to know much more about biology.

This has been reflected in the growth of biochemistry programmes, which seek to link chemistry and biology. However, biochemistry is not treated in the same way across Europe: it may or may not be integrated with chemistry as far as departmental structures are concerned. Thus there are no uniform platforms for discussion between chemists and biochemists in European universities.

Perhaps as a result of this, there is an emerging trend for chemistry departments to offer new degree courses referred to as «chemical biology». These build on a considerable chemical basis, but include various elements of biology. However, even where such courses do not exist it is becoming apparent that any chemist needs to have certain competences in biology, and to deal with this an additional sub-discipline is being defined. The traditional basic sub-disciplines of chemistry are organic, inorganic and physical chemistry (analytical chemistry is considered by many as a separate sub-discipline, but there is no consensus: teaching of analytical chemistry is often subsumed under inorganic chemistry). The new sub-discipline is referred to as «biological chemistry», and the chemistry group in Tuning considers that teaching in this area is vital for a modern chemistry first cycle degree course, as competences in this area are an absolute must for the chemistry graduate of today.

2. *Degree profiles and Occupations*

Typical degrees offered in Chemistry

Cycle	Typical degrees offered
First	BSc in Chemistry (see Eurobachelor for planned structures: www.eurobachelor.net)
Second	MSc in Chemistry (Masters degrees may be purely by research or, more typically, by a mixture of course work and a substantial thesis component, usually involving one of the sub-disciplines listed in the Eurobachelor proposal)
Third	PhD in Chemistry (Doctorate by research, usually requiring examination and defence of a substantial and original piece of research described in a comprehensive thesis)

Typical occupations of the graduates in Chemistry (map of professions)

Cycle	Occupations
First	Apart from the UK and Ireland, no valid information on first cycle graduate employment is available, because there are virtually no graduates so far.
Second	Here there is not even information from the UK and Ireland, as Master programmes there exist almost only as professional one-year Masters run for people working in chemical/pharmaceutical/life science areas.
Third	A majority is probably employed in chemical/pharmaceutical/life science companies. Various other types of non-chemical employment are however known, particularly in those countries which do not have a manufacturing base in these areas.

Role of chemistry in other degree programmes

Chemistry teaching is important in the following first cycle degree programmes: biochemistry, chemical biology, chemical engineering, physics, mechanical/electrical engineering.

3. ***Learning outcomes & competences - Cycle level descriptors***

The «Dublin descriptors» have been adapted so that they can be applied directly to chemistry degrees. The result is the «Budapest chemistry descriptors», which are given below for the first and second cycle.

First Cycle
First cycle degrees in chemistry[4] are awarded to students who have shown themselves by appropriate assessment to: —have a good grounding in the core areas of chemistry: inorganic, organic, physical, biological and analytical chemistry; and in addition the necessary background in mathematics and physics; —have basic knowledge in several other more specialised areas of chemistry[5]; —have built up practical skills in chemistry during laboratory courses, at least in inorganic, organic and physical chemistry, in which they have worked individually or in groups as appropriate to the area; —have developed generic skills in the context of chemistry which are applicable in many other contexts; —have attained a standard of knowledge and competence which will give them access to second cycle course units or degree programmes. Such graduates will: —have the ability to gather and interpret relevant scientific data and make judgements that include reflection on relevant scientific and ethical issues; —have the ability to communicate information, ideas, problems and solutions to informed audiences; —have competences to fit them for entry-level graduate employment in the general workplace, including the chemical industry; —have developed those learning skills that are necessary for them to undertake further study with a sufficient degree of autonomy.

[4] A Eurobachelor qualification.

[5] Such as computational chemistry, materials chemistry, macromolecular chemistry, radiochemistry.

Second Cycle
Second cycle degrees in chemistry are awarded to students who have shown themselves by appropriate assessment to: —have knowledge and understanding that is founded upon and extends that of the Bachelor's level in chemistry, and that provides a basis for originality in developing and applying ideas within a research context; —have competences to fit them for employment as professional chemists in chemical and related industries; —have attained a standard of knowledge and competence which will give them access to third cycle course units or degree programmes. Such graduates will: —have the ability to apply their knowledge and understanding, and problem solving abilities, in new or unfamiliar environments within broader (or multidisciplinary) contexts related to chemical sciences; —have the ability to integrate knowledge and handle complexity, and formulate judgements with incomplete or limited information, but that include reflecting on ethical responsibilities linked to the application of their knowledge and judgements; —have the ability to communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously; —have developed those learning skills that will allow them to continue to study in a manner that may be largely self-directed or autonomous, and take responsibility for their own professional development.

The chemistry subject area group has devised the Eurobachelor framework for a first cycle degree. This framework refers directly to the Tuning list of generic competences and defines subject-based competences.

The generic competences to be developed during the first cycle (not in order of importance) are:

- —capacity for applying knowledge in practice,
- —planning and time management,
- —oral and written communication in the native language,
- —knowledge of a second major European language,
- —capacity for analysis and synthesis (in a general, not a chemical sense),
- —capacity to learn,

—information management skills (ability to retrieve and analyse information from different sources),
—capacity to adapt to new situations,
—problem-solving,
—decision-making,
—teamwork,
—ability to work autonomously,
—ethical commitment.

In our discussion of subject-specific competences, which in the Eurobachelor framework we refer to as abilities and skills, we identified the following as relevant to the first cycle:

1. *Chemistry-related cognitive abilities and skills:*

   1.1. Ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas identified above.
   1.2. Ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems of a familiar nature.
   1.3. Skills in the evaluation, interpretation and synthesis of chemical information and data.
   1.4. Ability to recognise and implement good measurement science and practice.
   1.5. Skills in presenting scientific material and arguments in writing and orally, to an informed audience.
   1.6. Computational and data-processing skills, relating to chemical information and data.

2. *Chemistry-related practical skills:*

   2.1. Skills in the safe handling of chemical materials, taking into account their physical and chemical properties, including any specific hazards associated with their use.
   2.2. Skills required for the conduct of standard laboratory procedures involved and use of instrumentation in synthetic and analytical work, in relation to both organic and inorganic systems.
   2.3. Skills in the monitoring, by observation and measurement, of chemical properties, events or changes, and the systematic and reliable recording and documentation thereof.

2.4. Ability to interpret data derived from laboratory observations and measurements in terms of their significance and relate them to appropriate theory.

In Phase III of Tuning the chemistry group intends to continue its work to produce subject-based cycle descriptors. It appeared to us that the state of the discussion in our subject area across the Bologna area was not sufficiently advanced to allow us to do this in Phase II, particularly with respect to the third cycle, the Dublin descriptors for which were only formulated (with the help of the chemistry subject area coordinator) in March 2004.

Consultation process with stakeholders

The chemistry group in Tuning is comprised of members of the European Chemistry Thematic Network (ECTN), which has been running successfully since 1996. This network is financed by the EU Commission. The network comprises mainly academic institutions. It is difficult to involve people from industry as the employer has to provide the time to allow its employees to participate. However, a number of national chemical societies are members of ECTN, and these societies have a large membership from the industrial chemistry community. The ECTN is trying to get more industrial involvement by getting in contact with industrial organisations, such as the European Chemical Industry Council (CEFIC). However, the distance from bodies such as CEFIC from the industrial floor is great. Thus so far we have not found the correct mechanisms on a European basis for involving chemical industry in our deliberations.

The situation at national level is however different. Thus for example in November 2004 a one-day meeting involving academics and people from industry was held in Germany. Naturally one important topic was the employment potential for graduates from the various cycles, while another was the description for industry representatives of how the Bologna reforms will be carried out in chemistry in Germany. Other such meetings are taking place in other countries.

Another potential opportunity for dialogue, this time between academics and students, was the Bologna Seminar «Chemistry Studies in the European Higher Education Area» held in Dresden, Germany in June 2004. There were almost 200 participants from 25 countries, but despite the efforts of the organizers to involve students, their participation was unfortunately close to zero. One reason for this is that, although there is a European students union, ESIB, there is no corresponding organization for chemistry students.

4. ***Workload and ECTS***

Workload of the typical degree programmes expressed in ECTS credits

Cycle	ECTS Credits
First	180
Second	120
Third	Average 3-4 years

Trends and differences within the European higher education area in this subject area

Chemistry is the only subject area to have produced a European framework for the first cycle (the Chemistry Eurobachelor). A Eurobachelor Label is available to interested institutions, and the introduction of the Label is presently supported by the EU Commission under the Socrates Programme.

Chemistry is also the only subject area to have had its own Bologna Seminar, «Chemistry Studies in the European Higher Education Area», held in June at the TU Dresden (Germany). The conclusions and recommendations of the seminar, which cover all three cycles, can be found on the official Bergen 2005 website (http://www.bologna-bergen2005.no/) under «Bologna Seminars».

The chemical industry is still one of the most important in Europe, with about 3 million employees. Many of these are chemistry graduates, and the industry is starting to get to grips with the new degrees which are being introduced in Europe.

Traditionally, chemistry has been divided into three major sub-disciplines: organic, inorganic and physical. In some institutions a fourth, analytical chemistry, is present as a separate sub-discipline, but is often subsumed under inorganic chemistry. However, chemistry is moving towards biology, so that some countries are introducing new programmes in «chemical biology» (there is also a separate, but related, discipline of biochemistry). It thus seems clear that a new sub-discipline, which we can call biological chemistry, will soon join the three major sub-disciplines.

Chemistry is a well-defined discipline, so that no fundamental differences between degree programmes in European countries are present. One important difference between programmes lies in the amount of time which is devoted to laboratory courses. Laboratories are expensive and require considerable amounts of manpower, so that there is a tendency to cut them back when (as always at universities!) money is scarce.

5. ***Learning, Teaching and Assessment***

Methods and techniques of instruction and learning, taking into account the differences in cultures both in institutions and countries

In Chemistry the differences in culture between countries and between institutions are not that great. Thus methods and techniques for instruction and learning will not differ in principle but more in the extent to which they are used. As has been detailed above, practical courses play a very important role in the education of a chemist. At the same time, these are the most expensive aspect of the training, as they require large amounts of laboratory space, very close supervision, expensive apparatus and chemicals etc. This, together with the fact that in some countries the student intake is very high, means that it is not always possible to provide the student with as much practical training as is really required during the first cycle. The deficits can be made up in the second and third cycles, of course, but here the student numbers are smaller.

Competence development

There is much discussion as to whether it is possible to separate generic and subject-specific competences. In some subject areas there are proposals to allocate a certain proportion of credits to courses on generic skills given by persons outside the subject area. It is our opinion that in chemistry courses this is not necessary and may even be counter-productive. These two types of competence are often inseparable, as will be shown below.

Our work on genetic competences has shown clearly that the competences referred to above can be and indeed are developed within the normal teaching process (although teachers and students alike have in the past not given though to this). The one key competence where work needs to be done in some departments is teamwork, something which has not been emphasised in course design in the past. The other key competences are developed during normal teaching and thus cannot and should not be divorced from subject area teaching.

In some countries the subject of employability is discussed at some length, since the expression «relevance to the labour market» in the Bologna declaration has been misunderstood in translation. We, as chemists, often have the idea that a BSc in chemistry will not be employable in chemical industry, for example, simply because traditionally there were no bachelors on the market in our particular countries.

It is slowly becoming clear that this situation will change, as industry will certainly modify its attitude when universities offer the «product» bachelor and explain its profile with the help of the Diploma Supplement.

How counter-productive an employability discussion can be in our subject becomes more clear when we consider, say, a history graduate. History graduates are certainly employable, but not in a history industry! They are employable because of the generic skills which they have developed, and in some cases they will be employed in «history-related» positions.

The same is true of the chemistry graduate, as a look at the situation in the UK and Ireland will show. Here the chemistry graduate who takes up a job after graduating with a first degree (and this is the majority) may go into a «chemistry-related» job, but in many cases will not.

Europe needs first cycle degree graduates with a knowledge of chemistry, whatever these graduates do after leaving university!

Implementation of subject-specific competences: Three Examples

Three aspects of implementation will be covered, i.e. teaching, learning and assessment. In order to gather material on which to base some useful conclusions, a series of questions was posed to members of the chemistry group. Three of these will be considered here:

*How do you help students to achieve this competence in your **teaching methods**?*

What ***learning activities*** do your students engage with in order to develop this competence?

How do you ***assess*** whether, or to what degree, they have achieved this competence?

Ten subject-based competences were selected and members of the group were asked to answer these questions for the competences which were assigned to them. The selected competences had already been assigned by the group as being particularly relevant to the first cycle and thus could be considered as genuine «key competences» in the education of a chemist. Three examples are presented here. In each case corresponding generic competences are given.

Ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories (Country: France, Grande École). Corresponding generic skills: capacity for applying knowledge in practice, oral and written communication in the native language, capacity for analysis and synthesis, information management skills, capacity to adapt to new situations, problem-solving, ability to work autonomously.

How do you help students to achieve this competence in your teaching methods?
Lectures, problem classes, practical classes, and an undergraduate research project. The knowledge and understanding is communicated by means of written answers to questions (problem classes or examinations) or by an oral presentation of the project work, or presentation of answers to problems in front of the tutorial group.

What learning activities do your students engage with in order to develop this competence?
Lectures, problem classes, practical classes, industrial placements and a research project.

How do you assess whether, or to what degree, they have achieved this competence?
By means of written (and sometimes oral) examinations, continuous assessment of practical work and problem classes. Assessment of the research project includes an oral presentation in which communication skills are assessed as well as scientific understanding.
All assessed work is returned to the student. They are given marks for each examination/assessment, and they are given their class ranking at the end of each semester. Students with difficulties are interviewed by the person responsible for the appropriate year of study, and, if necessary, by the head of studies.
There is a meeting each semester attended by all teachers and by elected representatives of the class. At this meeting, the performance of all students who have not achieved the standard required is discussed so that the reasons for non-achievement can be determined, and communicated to the student if necessary.

Ability to recognise and analyse novel problems and plan strategies for their solution (Norway). Corresponding generic competences: capacity for applying knowledge in practice, written communication in the native *language, capacity for analysis and synthesis, information management skills, problem-solving, decision-making, ability to work autonomously.*

How do you help students to achieve this competence in your teaching methods?
Students are supervised throughout all laboratory exercises, and skills in observation trained by question and answers sessions, tutorials etc. The significance of the results obtained forms a part of all laboratory reports as does relation to the appropriate theory.

What learning activities do your students engage with in order to develop this competence?
Laboratory work and writing of laboratory reports is the most important method of achieving these skills.

How do you assess whether, or to what degree, they have achieved this competence?
Student laboratory performance is assessed on a continuous basis by staff present in the laboratory, and laboratory reports carefully checked. Examinations in connection to laboratory courses are also of some importance

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Planning, design and execution of practical investigations (Spain). Corresponding generic skills: capacity for applying knowledge in practice, planning and time management, oral and written communication in the native language, capacity for analysis and synthesis, information management skills, capacity to adapt to new situations, decision-making, ability to work autonomously, ethical commitment.

How do you help students to achieve this competence in your teaching methods?
Through exercises and practical examples: setting the scene, clarifying issues, and helping students to recognise and become familiar with the scheme for developing a correct strategy.
Homework tasks with selected topics which teams of students could make exercise.
Discuss their work in class in order to optimise their results.

What learning activities do your students engage with in order to develop this competence?
Attend seminars and tutorials. Participate in discussions after different working groups presentations analysing procedures.

How do you assess whether, or to what degree, they have achieved this competence?
Following up on their homework during tutorials.

6. ***Quality enhancement***

Tuning has identified a series of steps in designing new degree programmes:

1. Definition of academic and professional profiles: translation into learning outcomes and generic and subject specific competences.
2. Translation into curricula.
3. Translation into modules and approaches towards teaching, learning and assessment.
4. Programme quality assurance: built in monitoring, evaluation and updating procedures.

As far as chemistry is concerned, these cannot be applied in the same manner to first, second and third cycle programmes. The following discussion will be structured according to points 1 to 4 and not according to cycles, however.

Definition of academic and professional profiles: translation into learning outcomes and generic and subject specific competences

First cycle

Academic and applied Bachelor programmes are available in Europe, but there appears to be only a small number of applied degree courses available or in planning in pure chemistry. Applied chemistry-related degrees are more likely to be in chemical engineering. A recent survey shows that more 180-credit programmes are likely to be offered, though there appears to be a trend towards 240 as one moves East in Europe. Spain, unfortunately, has not made a final decision, though Catalunya has a pilot project for 180-credit degrees.

The question of defining a difference in profile between 180- and 240-credit programmes does not appear to have been addressed at all. There are merely political, not subject-based, reasons for going in one direction or the other.

Second cycle

In chemistry it appears at present that «academic» Masters will become the norm in post-Bologna Europe. The Dresden Bologna Seminar made the following recommendations:

—120 ECTS credits should be the reference point for Master programmes.

—The Master thesis should carry at least 30 ECTS credits and the research work should be organized over a defined period of time in order not to hamper student mobility.
—At the second-cycle stage institutions will in future have to compete on both a national and international basis for the best students. Thus they will need to design attractive study programmes which reflect their individual structures.
—The definition of a «Euromaster profile» analogous to the Eurobachelor will not be possible, because of the greater degree of specialisation of the former. However, the joint degree framework envisaged by the ERASMUS MUNDUS programme can act as a model for the development of genuinely «European» qualifications in chemistry.
—Access criteria for second-cycle programmes must be flexible and carefully-devised in order to make the programmes attractive. The right of access envisaged by the Lisbon Recognition Convention must be respected. No quota systems should be imposed, as these affect the rights of the individual as well as of the institution.
—Flexibility based on the bachelor diploma supplement should be introduced to handle specific situations (change of orientation, non-European students, excellent students)
—High-quality students must be afforded the possibility of transferring to a doctoral programme without formal completion of the Master degree, as stated in the recommendations of the Helsinki «Bologna series» Master conference.
—It is broadly accepted that a second cycle qualification will take a total of around five years of study to obtain, although the precise duration will depend on the learning outcomes to be achieved. Where the study pattern is, for example, 4+1 as opposed to 3+2 years, admission to a one-year second cycle course could at present involve a requirement for extra study or experience from a 3-year first cycle graduate, e.g. industrial experience.
—Master courses should be taught in English on request wherever possible.

The UK has second-cycle one-year Masters which can be referred to as more «professional» in nature, but there does not yet seem to be a tendency in continental Europe to go down that road. Instead, it appears likely that master programmes will carry 90-120 credits according to the Helsinki recommendations. The question of organising the transition of suitably qualified candidates from master to PhD programmes without formal award of a master qualification is still under discussion on a national basis, but mechanisms will become established in the next few years.

Third cycle

In chemistry, the third cycle has a purely academic profile. Traditionally, it consisted only of research (generally basic but also applied) supervised by a single academic supervisor and leading after an undefined period to the award of a PhD (or corresponding national qualification) on the basis of the thesis submitted and an examination carried out according to national or local regulations.

However, the picture across Europe is presently not uniform. More and more there is movement away from the «research only» PhD to structured PhD programmes, and quality enhancement will have as its major task the development of such programmes and their adaptation to the changing needs of our science.

According to an ECTN survey carried out in 2002, the «average» PhD in Europe will have:

- taken 3-4 years for his/her thesis,
- done some work as a teaching assistant,
- been supervised by one supervisor,
- written intermediate reports before writing the thesis,
- been the author of at least one publication in an internationally refereed journal,
- written his/her thesis in English or the national language,
- passed the examination without grading,
- done some coursework (up to 60 ECTS credits),
- taken a public oral exam with at least one external examiner,
- done his/her PhD in the home country.

The recommendations of the Dresden Bologna Seminar for the third cycle were as follows:

- Structured degree programmes which include coursework (in the widest sense of the term) should become a common feature of European PhD studies; however, research must still be the major element of such programmes. Part-time PhD studies should remain possible in institutions where it has been a normal feature.
- The average European PhD should spend 3 to 4 years on his or her studies. The research element of the PhD study programme should not be awarded ECTS credits.

—ECTS credits should be used to quantify the coursework component. These credits can however be upgraded, as the correct use of the (relative) ECTS grading scale will not be possible. A wide range of ECTS credits (anywhere between 20 and 60) can be envisaged. Use of the national grading scale is of course possible.
—Apart from research and coursework, further important elements of the PhD programme are teaching (as teaching assistants) and the training of key generic skills, such as those listed in the Appendix of the Chemistry Eurobachelor document.
—Institutions should issue transcripts containing information on all the coursework carried out, and on work done as a teaching assistant. Such transcripts will probably not use the standard European Diploma Supplement format.
—Institutions are encouraged to develop «Graduate School» structures at departmental, interdepartmental or regional level in order to increase their national and international visibility, to increase their research potential and to foster cooperation both between
—Staff and between students.
—National structures for setting up research networks should be extended in order to internationalise such networks. PhD students should spend part of their research time at other institutions, preferably in foreign countries.

Translation into curricula

FIRST CYCLE

The design of curricula is the province of the academic staff. It is important to try not to restrict their freedom unneccesarily, while at the same time defining standards.

The chemistry Eurobachelor does not attempt to define curricula in any detail. It suggests the following features:

a) a «core» of at least 90 credits of compulsory modules/courses, taken from the following areas:

—organic chemistry
—inorganic chemistry
—physical chemistry
—analytical chemistry
—biological chemistry

— physics
— mathematics

b) semi-optional courses covering at least three further sub-disciplines (at least 5 credits each);
c) optional courses;
d) a Bachelor thesis with 15 credits.

Within these limits the institution is free to structure its degree.

Second cycle

The major element of Master programmes will be the research component, which will probably carry between 30 and 60 credits (30 may become the norm, but this is not yet clear).

There will be a certain compulsory element in Master programmes, but these will generally be very flexible as there will be a connection between coursework and the direction of the research area chosen. The Master programme in chemistry will not be simply a continuation of the Bachelor programme.

While it appears advisable to define a framework for a Bachelor programme (the Eurobachelor), no such framework is necessary for a Master programme.

Third cycle

There will be no defined curricula. Instead, the ideal situation is that each PhD student is counselled on the courses he/she should take as part of the defined amount of coursework.

Translation into modules and approaches towards teaching, learning and assessment

First cycle

The translation into modules is left entirely to the department or faculty concerned. However, as far as teaching, learning and assessment is concerned, the Eurobachelor framework does make some important statements. Masters degrees may be purely by research or, more typically, by a mixture of course work and a substantial thesis component, usually involving one of the sub-disciplines listed above. A significant number of such courses have strong connection with industry.

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Second cycle

The same applies as for the first cycle, as there is no fundamental change on going from one to the other. Naturally the competences will change.

Third cycle

The important aspect here is assessment. Two points are involved, both of which are concerned with the thesis. Firstly, the reviewing and (if required) grading of the thesis needs to be put on an open footing, with the involvement of external examiners. Secondly the extremely disparate procedures for the final examinations of PhD students need to undergo a certain amount of harmonisation.

Programme quality assurance: built in monitoring, evaluation and updating procedures

First cycle

Monitoring will consist mainly of following the progress of the students (in terms of assessment results) through the individual modules/course units. At the same time a database on where graduates go after graduation will be necessary. Monitoring will naturally include feedback from the students (evaluation) on the individual modules/course units; this will include feedback on actual workload. Correlations between workload and assessment results can be derived.

Updating must be carried out continually.

Second cycle

The same applies as for the first cycle.

Third cycle

Monitoring will be a difficult process. Firstly institutions need to build up a database on where their graduates go after leaving the university. One element here can be the establishment of a functioning alumni programme. With the help of the database it will then be possible to carry out evaluation of the success of the graduates in their chosen professions.

2.2.3. **Earth Sciences (Geology)**

1. ***Introduction***

Earth Sciences focuses on the understanding of Earth systems in order to learn from the past, understand the present and predict and influence the future. It deals primarily with a study of materials, processes and history of this and other planets. Earth Sciences provide a distinctive education by providing a systematic multi- and inter-disciplinary approach to complex natural systems. Comprehensive field training, a range of spatial and temporal analytical skills, and encouragement for graduates to use their powers of observation, analysis and imagination to make decisions in the light of uncertainty are all characteristics of an Earth Sciences degree.

It is taken as being self-evident that a knowledge and understanding of the Earth and its systems are of incalculable value both to the individual and to society at large, and that the first object of education in Earth Science is to enable this to be acquired. However, given the width of the subject, it is impossible to define a single core body of knowledge. Consequently a range of different approaches are required in the manner in which the vast body of knowledge which constitutes this subject is presented at undergraduate degree level throughout Europe.

The concepts, theories and methodologies of other sciences are themselves used by many earth scientists and applied to the Earth system. Therefore, training in relevant aspects of such basic disciplines will normally constitute a part of an Earth Sciences degree. It might also be appropriate to include relevant elements of humanities, economics and social sciences in degree programmes in Earth Sciences.

Earth Sciences also develop ways of thinking which are intrinsic to the discipline while being no less transferable. These include[6]:

1) a four dimensional view —the awareness and understanding of the temporal and spatial dimensions in earth process—;
2) the ability to integrate field and laboratory evidence with theory following the sequence from observation to recognition, synthesis and modelling;
3) a greater awareness of the environmental processes unfolding in our own time; and
4) a deeper understanding of the need to both exploit and conserve earth resources.

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[6] This list is indicative, not prescriptive.

2. ***Degree profiles and occupations***

Typical degrees offered in the Earth Sciences

Cycle	Examples of typical degrees offered
First	Bachelors degrees tend to be holistic with a wide range of subject descriptors including: Geology (including Mineralogy; Petrology; Sedimentary Geology; Resource Geology; Structural Geology; Tectonics; Palaeontology; and Stratigraphy); Physical Geography (including Geomorphology), Soil Science, Hydrogeology and Hydrology, Geophysics; Geochemistry; Environmental Geology; Engineering Geology; Ocean Science and Environmental Science. Earth Sciences may comprise a significant component in multi-disciplinary degrees covering resources, environmental management and planning, the atmosphere, climate and palaeoclimate.
Second	Masters degrees may be purely by research or, more typically, by a mixture of course work and a substantial thesis component, usually involving one of the sub-disciplines listed above. A significant number of such courses have a strong vocational component.
Third	Doctorate by research, usually requiring examination and defence of a substantial and original piece of research described in a comprehensive thesis.

Typical occupations of the graduates in the Earth Sciences (map of professions)

Cycle	Occupations
First	Trainee level earth scientist («Junior geologist» etc.) Teacher in secondary education (initial years) in earth science / geography/science
Second and Third	Industry (hydrocarbons, minerals etc.) Public offices (Survey, Research Institutes etc.) Consultancy (private agencies, personal) Universities (Research and education) Public offices (various agencies concerned with soil, water, physical planning, natural hazards, environmental conservation, agriculture etc). Also public Research Institutes Private companies (waterworks etc.) Teacher (Secondary School) in Earth Sciences /Geography/Science Museum functions Engineering Geology Science journalist etc.

Role of Earth Sciences in other degree programmes

The Earth Sciences overlaps with other degree programmes such as environmental sciences, social science-based environmental studies, biology, chemistry, physics, mathematics, civil engineering, geography and archaeology. Earth Science is defined by many to include engineering geology, mining engineering, petroleum engineering and physical geography, while some would also include oceanography and meteorology. The Earth Sciences promotes an awareness of the dual context of the subject in society, namely that of providing knowledge and understanding for both the exploitation and the conservation of the Earth's resources.

An Earth Sciences degree programme requires underpinning knowledge especially in the fields of Chemistry, Physics, Biology, Mathematics and Information Technology, some of which may properly constitute part of the Earth Sciences curriculum. Earth Sciences are also relevant to Law and Economics, Town and Country Planning, Human Geography, Politics and Sociology, and Management, Business and Safety studies. Students often receive instruction from outside the core department and may have an opportunity to gain joint degrees.

3. *Learning outcomes & competences - level cycle descriptors*[7]

First Cycle	
Key Subject Specific Competences	***Key Generic Competences***
—Show a broad knowledge and understanding of the essential features, processes, history and materials of System Earth. —Recognize the applications and responsibilities of Earth Science and its role in society. —Show adequate knowledge of other disciplines relevant to Earth Science. —Independently analyze earth materials in the field and laboratory and to describe, analyse, document and report the results. —Be able to reason in large-scale spatial and, or temporal frameworks. —The application of simple quantitative —methods to Earth systems.	—Work both independently and in a team. —Basic general knowledge —Grounding in basic knowledge of the profession. —Oral and written communication in your native language. —Knowledge of a second language. —Elementary computing skills. —Information management skills. —Awareness of safety. —Ability to communicate Earth Science issues with the wider society.

[7] The wide nature of the subject means that this list is ***indicative*** and not ***prescriptive.***

Second Cycle	
—To demonstrate a comprehensive knowledge in at least one specialized area of Earth Science. —Be able to define, determine and implement a strategy for solving an Earth Science problem. —To be able to understand the interactions of earth processes and test the results of these. —To produce a substantial report or thesis (including an executive summary).	—Research skills. —Capacity for analyses and synthesis. —Problem solving. —Information management skills (ability to retrieve and analyse information from different sources).
Third Cycle	
—Demonstrate the ability to perform independent, original and ultimately publishable research in the field of Earth Sciences.	—Creativity. —Critical and self-critical abilities. —Capacity for generating new ideas (creativity).

Consultation process with stakeholders

The Earth Sciences profession is represented by learned societies, many of which have been established since the 19th century. Professional bodies have grown up at both national and European level by the end of the 20th Century, some having associations with these learned societies. Both of the above may offer degree accreditation. In many of the northwestern countries degree accreditation is provided for by national law. The extractive, mining and hydrocarbon industries have had a long tradition of liaison with university Earth Sciences departments as have national bodies such as Geological Surveys, Environmental Protection Agencies and Museums. In general, there is a healthy and ongoing debate about the relevance of Earth Science education to the needs of the profession and society.

4. *Workload and ECTS*

Cycle	ECTS Credits
First	Mostly 180 or 240
Second	60, 90 or 120
Third	Mostly three years after completion the Masters Degree.

Many countries award a First Cycle Bachelors Degree after either 180 ECTS or 240 ECTS. The first model is currently the most common. There are still some individual programmes that differ from this model (150 ECTS and 210 ECTS) and are unlikely to change in the near future. Several countries are in the process of changing their existing programmes to fit the «Bologna» Model. It is likely that both 180 ECTS and 240 ECTS models will be adopted and these may be programme, rather than country, specific. A variety of models exist for Second Cycle Masters Degrees which are awarded after 60, 90 or 120 ECTS. There is least standardisation at the Third Cycle level. Many countries require that the Doctorate be taken after the completion of a Masters Degree. In practice many students study for much longer than 3 years although some administrations are starting to penalise this practice.

5. ***Teaching, learning & assessment***

The Group considers that it is inappropriate to be prescriptive about which learning, teaching or assessment methods should be used by a particular programme. This is because Earth Sciences programmes may (e.g. based on the requirements of different subdisciplines) be differently oriented and are embedded in diverse educational cultures within individual European countries. Different institutions, moreover, have access to different combinations of teaching resources and variable modes of study in addition to the traditional full time degree course. However, staff involved in course delivery should be able to justify their choices of learning, teaching and assessment methods in terms of the learning outcomes of their courses. These methods should be made explicit to students taking the courses concerned.

Learning, teaching and assessment should be interlinked as part of the curriculum design process and should be appropriately chosen to develop the knowledge and skills identified in the specification for the student's degree programme. Research and scholarship inspire curriculum design of all Earth Science programmes. Research-led programmes can develop specific subject-based knowledge and skills.

The Group believes that it is impossible for students to develop a satisfactory understanding of Earth Sciences without a significant exposure to field based learning and teaching. We consider this learning through experience as an especially valuable aspect of Earth Science education. We define «field work» as observation of the real world using all available methods. Much of the advancement in knowledge and understanding in our Earth Sciences is founded on accurate observation and recording in the field. In addition, fieldwork trains Earth Science students to formulate sound conclusions on the basis of (necessarily) incomplete data. Students and employers consider this an important aspect of their training. Developing field-related practical and research skills is, therefore, essential for students wishing to pursue careers in Earth Sciences. Additionally field-based studies allow students to develop and enhance many of the Graduate Key Skills (e.g. teamworking, problem-solving, self-management, interpersonal relationships) that are of value to all employers and to life-long learning.

Existing Earth Sciences programmes have developed and used a very diverse range of learning, teaching and assessment methods to enhance student learning opportunities. These methods should be regularly evaluated in response to generic and discipline-specific national and international developments and incorporated where appropriate by curriculum developers.

Best Practice

Method of Teaching, Learning & Assessment	**Some Key Competences Gained**
A field trip in which students are first shown a problem in the field, made rehearse the necessary skills and then required to analyse the problem (usually in small groups) and to report their results. This exercise is usually performed during the second and, or third year of a Bachelors programme.	—Work both independently and in a team. —Be able to reason in large-scale spatial and, or temporal frameworks. —The application of simple quantitative methods to Earth systems. —Oral and written communication in your native language. —Awareness of safety. —An appreciation of the complexity of the environment. —Capacity for applying knowledge in practice.
To conduct an internet search, at First Year Level, to investigate recent advances in the study of another planet (e.g. Mars). Usually some guidance is given in terms of useful sites to initiate the research. Students may work in groups or singly and must produce, in their own words, a summary of their discoveries. These should be presented at a student seminar and assessed by both fellow students and staff.	—Elementary computing skills. —Information management skills. —Work both independently and in a team. —Capacity for analyses and synthesis. —Be able to reason in large-scale spatial and, or temporal frameworks. —Concern for quality. —Oral and written communication in your native language.

Method of Teaching, Learning & Assessment	*Some Key Competences Gained*
The analysis of a set of earth materials in the laboratory using a petrological or a binocular microscope with a view to placing these materials within an existing classification scheme. This exercise should include the description and recognition of the components (mineral, rock, or fossils) of the sample, the preparation of a clear, accurate record of this analysis and some quantification of the findings. Such samples may have been collected during a previous field trip.	—Elementary computing skills. —Information management skills. —Independently analyse earth materials in the field and laboratory and to describe, analyse, document and report the results. —Grounding in basic knowledge of the profession. —The ability to accurately record and describe natural materials. —Ability to work autonomously. —Concern for quality.

6. *Quality enhancement*

The Earth Sciences Subject Area Group, whilst recognising the importance of quality enhancement throughout all aspects of degree design and delivery, wishes to emphasize the role of field work in enhancing the quality of its degree programmes. The current trend towards a «compensation culture», increasing costs and modularisation of degrees makes it increasingly difficult to implement a comprehensive fieldwork programme within the framework of a First Cycle Degree. Field instruction follows three models: demonstration of natural features by staff to large groups; small group problem solving; and individual or paired project work over several weeks analysing a field problem. All of these provide an unique opportunity to apply knowledge in practice and develop the competences necessary for the workplace. Professional societies normally require evidence that a graduate has undertaken considerable independent field work, either in the context of their degree studies and, or whilst supervised in the workplace, before giving professional recognition. Students find field work attractive and it encourages them to study science subjects which contain a field work component. A comprehensive, safe, well planned and managed field programme will enhance the quality of almost all Earth Sciences degree programmes.

2.2.4. **Education Sciences**

1. *Introduction to the subject area*

Education is a multidisciplinary subject informed by a range of foundation disciplines such as Psychology, Sociology, Philosophy,

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Applied Linguistics, Curriculum Studies, Social and Policy Studies, Social Anthropology and History. In the case of Teacher Education, various teaching subjects (e.g. mathematics, languages and literature, science, social sciences, arts, etc.) are also used to explicate the nature of teaching, learning and assessment for all subjects in a wide variety of socio-cultural-economic contexts. Because of the human focus of the subject, it is one where moral and ethical values are highly prioritised.

The subject is divided into two broad but closely linked fields, Teacher Education and Education Sciences[8].

Teacher Education

Today in Europe all secondary school teachers, almost all primary school and many pre-school teachers are educated to first degree level or equivalent. In many, if not most, countries the curricular components and standards of achievement follow national guidelines set by Ministries of Education or professional bodies such as Teaching Councils, lending a degree of homogeneity to programmes. In others university autonomy takes precedence and there may be great disparities between courses in different universities. However, future teachers must acquire a range of competences including the knowledge, values and skills necessary for achieving the highest academic standards in their subject or areas of the curriculum, as well as being fully aware of the theory and practice of education relevant to the age-group they are to teach; of national priorities in education; and of teachers' roles as professionals in fast changing and unpredictable social contexts.

Initial teacher education courses at first or second cycle level is also provided for university teachers, vocational college teachers, nurse tutors, in 50 % of the countries represented in the Education Sciences working group.

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[8] ISCED 1997 classification; see
http://www.unesco.org/education/nfsunesco/doc/isced_1997.htm
Education
14 Teacher training and education science

Teacher training for pre-school, kindergarten, elementary school, vocational, practical, non-vocational subject, adult education, teacher trainers and for handicapped children. General and specialized teacher training programmes. *We shall not use the term teacher training but the more commonly used term Teacher Education.*

Education science: curriculum development in non-vocational and vocational subjects. Educational assessment, testing and measurement, educational research, other education science.

Most countries provide programmes of continuing professional development for teachers, other education professionals, health workers and others (which may be compulsory), but which do not always lead to a higher qualification. However, degrees at second and third cycle level are widely available for those who wish to take them up.

The Education working group has identified an anomalous situation with regard to Teacher Education within the context of the implementation of first and second cycles of degree awards. This anomaly is particularly evident in consecutive models of teacher education where students study one or two academic disciplines (180-240 ECTS) prior to a postgraduate teacher education component of their studies (60-90 ECTS). Although students may have accumulated a total of 240-320 ECTS in order to obtain their initial teacher education qualification, in a number of countries 300+ ECTS accumulated in this way does not result in a second cycle award. This is in spite of the fact that the postgraduate component may, to a significant degree, meet the level descriptors for second cycle.

- In order to ensure that Teacher Education should be compliant with Bologna first and second cycle degree structures, and that it has comparability with other disciplinary areas, the Education working group recommends that the structures of Teacher Education first and second cycle degrees should facilitate this. A number of possible pathways to second cycle awards are suggested:
- A first cycle degree in the chosen subject(s) of 180-240 ECTS, followed by a consecutive Teacher Education award of 90-120 ECTS (a minimum of 90 ECTS where subject didactics or pedagogy is included in the first cycle degree), and including a research training component.
- A first cycle degree in the chosen subject(s) of 180-240 ECTS, followed by a second cycle consecutive Teacher Education award of 60 ECTS, followed, within a specified time limit, by a second cycle award in Education Sciences or structured induction (to include research training) of 60 ECTS.
- A first cycle integrated agree where the teaching subject(s) and education components are offered concurrently of 240 ECTS, followed by a second cycle award in Education Sciences/structured induction (to include research training) of 60 ECTS.

Education Sciences

There is considerable diversity in Education Sciences courses at first cycle level but all involve the intellectually rigorous study of educational processes, systems and approaches, and the cultural, societal, political and historical contexts within which they are embedded. Across Europe there is a broad similarity in content and focus of the core components of Education Sciences first degrees, taking into account that the particular content and focus of any given programme will vary according to its stated aims and rationale, but will be demonstrably appropriate to the needs of the students. While there are second cycle programmes in Teacher Education, many take a broader remit and might more properly be called Education Sciences, as is the case with doctoral studies.

2. *Degree profiles and occupations*

A range of practice is currently seen in Education programmes with regard to the Bologna model of three cycles. While some countries adopted a three cycle model many years ago, (UK, Ireland) others are at different stages of development, but in Education there are no countries represented within the subject group where the Bologna process is not being discussed with a view to implementation.

Typical degrees offered in Teacher Education

Cycle	Typical degrees offered
First cycle	Programmes for the preparation of pre-school, primary and secondary school teachers, and teachers from other sectors, include Education Sciences, subject-specific and/or domain specific pedagogical studies appropriate to the target learning domains, and an element of supervised teaching practice in the target domain, the length of which varies across the EU. Students also normally study one or two academic disciplines either concurrently (more often in pre-school/ primary/ secondary) or prior (more in often secondary) to the Education component of the programme. All secondary school teachers must be educated to first degree level in their chosen teaching subject, and this may be prior to the teacher education element, as in the consecutive teacher education model of a degree followed by a one-year intensive education programme such as is found in the U.K., Ireland and Spain. In some countries teachers must be educated to second cycle level in order to be awarded Qualified Teacher Status, e.g. Finland. In others primary and pre-school teachers may be educated to sub-first degree level initially. The trend, however, throughout Europe is towards an all graduate teaching profession at all levels of the Education sector.

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Cycle	*Typical degrees offered*
Second Cycle	A wide range of specialist programmes of continuing professional development are offered in Teacher Education, often leading to a Master's degree, but sometimes offering mid-points of completion at Diploma level. Second cycle study normally allows professionals to specialize further in their chosen fields or to obtain a qualification in a new area —e.g. a graduate in (pure) Mathematics (1st cycle) continues (2nd cycle) to become teacher of Mathematics. Typical second cycle degrees in Teacher Education include among others, Special Needs Education, Nurse Education, didactics related to specialist subjects in the curriculum, Teaching and Learning in Higher Education, Adult Education, Guidance and Counseling. Most second cycle programmes have a strong taught component, supported by an empirically and/or theoretically based thesis or dissertation which accounts for the final third (or more) of the programme. The taught component may include the development of professional skills such as systematic observation, testing, diagnosing and counseling, as well deepening or extending of knowledge and understanding. In many countries a wholly research based second cycle degree is available, often, but not always, linked to third cycle study.
Third Cycle	Doctorate by research, usually requiring examination and defence of a substantial and original piece of research at an international level of excellence described in a comprehensive thesis. There is an expectation in many countries that part of the earlier years of study will comprise a taught element associated with the development of research knowledge and skills and the practical design of a research project for the empirical and or theoretical element of the degree. In a few countries (Denmark, Portugal, Ireland, UK) a new form of doctoral degree has been, or is being introduced, with a strong professional focus. These professional doctorates include an assessed component of advanced subject study and a thesis based on original research similar, but shorter than, the doctorate by research.

Typical degrees offered in Education Sciences

Degree	Typical degrees offered
First cycle	First degrees in Education Sciences tend to be multidisciplinary, with a strong other subject element. In other countries e.g. Spain first degrees in Education Studies are single subject and focus on Education from a broad point of view and in all its complexity. Programmes draw on a wide range of intellectual resources, theoretical perspectives and academic disciplines to illuminate an understanding of education and the contexts within which it takes place. Typical degrees would include Educational Principles, History of Education, Sociology of Education, Adult Education; Educational Psychology; Youth and/or Community Work; Curriculum Development; Educational Administration; Healthcare related work; Human Resource Management; Management of Information and Library Studies; Social Education; Special Needs Education; Educational Policy, Educational Innovation, School Management. There is an increasing trend for there to be a specific component of Educational Research at first degree level, including subjects such as Methodological Basis of Educational Research, Methods and Models of research in Education, and basic Statistics.
Second Cycle	As with teacher Education second cycle degrees, in Education Sciences second cycle study normally allows professionals to specialize further in their chosen fields. Specialisms include Educational Psychology, Management of Education, Primary Health Care, Educational Anthropology, Philosophy of Education, and Educational Sociology. Most second cycle degrees contain a taught component, but at least 30%, consists of a research based dissertation or an applied project. In some countries e.g. Spain, Finland, Ireland, UK (the latter for second cycle degrees in Educational Psychology), some second cycle degrees include practical work in professional settings. As with Teacher Education, it is possible to complete a second cycle degree wholly by research. Typical second cycle degrees in Education Sciences are: Special Education Needs, Third Age Education, Intercultural Education, Educational Evaluation, School Management, Adult Education, Leisure Education, Social Pedagogy.
Third Cycle	Similar to the description of Teacher Education above.

Typical occupations of the graduates in Education Sciences (map of professions)

Cycle	Occupations
First cycle	***Teacher Education*** Teaching in schools, nurse education, universities/other higher education institutions, vocational education. Teachers of certain school subjects (e.g. mathematics, computer sciences, languages,) may find jobs outside education (communication, business etc). ***Education Sciences*** Education programmes of all kinds develop ways of thinking and doing that are highly transferable, and graduates of Education programmes are found in a wide range of professions. Education graduates are found in museum work, youth leadership, community work, publishing (designing and evaluating educational materials), local and national educational administration, counseling in education, educational management; educational services; teaching specific groups, such as adults, third age support, immigrant support work, and personnel management, the latter particularly salient in Sweden.
Second Cycle	***Teacher Education*** Teachers in schools (e.g. in Finland); Leadership and management roles; more specialist roles and supervisory roles in educational institutions; researchers; Guidance Counsellors; Special Education co-ordinator, Educational Psychologists (UK). ***Education Sciences*** Access to promotion to more senior positions in their chosen fields, or to new positions related to their chosen specialization; researchers.
Third Cycle	***Teacher Education & Education Sciences/Sciences*** University, Polytechnic and College lecturers; researchers; Ministry and teacher education agency professionals; an increasing number find employment as researchers in independent research and developmental institutes; R&D jobs in the administration of education at the national or municipal level (National Board of Education, Regional Developmental Centres), Quality Assurance Agencies; senior posts in curriculum development.

Role of subject area in other degree programmes

Education Sciences and Teacher Education are connected with many other degree programmes.

- Teachers must have a subject base in their studies and so all subjects related to the school curricula have some relationship with Education.
- Education Sciences may form part of a degree study programme in another subject area e.g. in history, business; or with a range of other subjects e.g. with history and business administration in Museum studies.
- In many universities across Europe, students now have a free choice of a small component in their degree course, and many choose Education modules to fulfil this element, e.g. students from psychology, other social sciences (sociology, anthropology, political science), or subject areas where students may be considering the option of going into teacher education after completing their first degree.
- In some areas of Education, e.g. Educational Psychology, an initial first-degree qualification in Psychology is followed by master's level work in educational psychology. Some professional clinical or teaching experience is also normally requirements to be able to practice as Educational Psychologists.
- Education units may form part of a wide range of programmes concerning Social and Human Sciences.

3. ***Learning outcomes & competences - level cycle descriptors***

The competences identified in Education Sciences are compatible with the European Framework and the Dublin descriptors. The Education working group wish to emphasize, however, that the competences identified are indicative only. The list is not intended to be either exhaustive or definitive, and should be used as such.

<table>
<tr><th colspan="2">First Cycle</th></tr>
<tr><td colspan="2">Many competences (generic and specific) are common to both teacher education and Education Sciences; some competences are specific to teacher education. Not all competences will be fully developed at the end of first cycle studies and will continue to develop over the continuum of professional life, often focused on during periods of in-service education and training, but not necessarily developed in a context of formal education.</td></tr>
<tr><th>Key subject specific competences</th><th>Key generic competences</th></tr>
<tr><td>Common to both Teacher Education and Education Sciences/Studies
Teachers and trainers should be able to work effectively in three overlapping areas, as should graduates of Education Sciences programmes. They should be able to:
—work with information and knowledge of subject to be taught, and of educational issues and their theoretical bases
—work with their fellow human beings —pupils/trainees, colleagues and other partners in education. This includes the ability to analyse complex situations concerning human learning and development in particular contexts;
—work with society —at local, regional, national, European and broader global levels including the development of appropriate professional values and the ability to reflect on practices and contexts;
—Abilities for reflection include the ability to reflect on their own and other's value systems, development and practices.

Teacher Education
—competence in a number of teaching/learning and assessment strategies and understanding of their theoretical bases;
—ability to create an equal and fair climate conducive to learning for all learners regardless of their socio-cultural-economic context.</td><td>Common to both Teacher Education and Education Sciences/Studies
—capacity to learn;
—communication skills;
—team working skills;
—information technology skills;
—problem solving;
—autonomy;
—reflection skills;
—interpersonal skills;
—planning and time management;
—decision-making;
—appreciation of diversity and multi-culturality;
—ethical commitment;
—critical and self-critical abilities;
—capacity to improve their own learning and performance, including the development of study and research skills;
—ability to analyze, synthesize, evaluate, to identify problems and work out solutions;
—firm knowledge of the profession in practice;</td></tr>
</table>

Second Cycle	
Key subject specific competences	**Key generic competences**
Common to Both Teacher Education and Education Sciences/Studies —competence in collaborative problem solving of educational issues in a variety of contexts; —ability to adapt practices to specific educational contexts; —development of knowledge and understanding in their chosen area of professional specialization in a major educational field —educational management and administration; curriculum studies; educational policy; adult education; learning difficulties; children's literature; —ability to use research appropriate to discipline to inform their practices; —ability to reflect on values appropriate to educational activities.	*Common to Both Teacher Education and Education Sciences/Studies* —research skills; leadership skills; —communication skills, including ability to communicate in advanced professional registers; —ability to reflect upon and evaluate own performance; —development of advanced cognitive skills associated with knowledge development and creation.

Third Cycle Teacher Education & Education Sciences	
Key subject specific competences	**Key generic competences**
—Acquisition and understanding of a substantial body of knowledge which is at the forefront of a field of learning in the field of Education; —Exercise personal responsibility and largely autonomous initiative in complex and unpredictable situations, in professional or equivalent contexts related to Education as a broad field; —Learn to critique the broader implications of applying knowledge to particular educational and professional contexts; —Scrutinise and reflect on social norms and relationships within their particular field of Education and lead action to change them; —Capacity to conduct (original) research; Demonstrate the ability to perform independent, original and ultimately publishable research in the different fields of Education and/or school pedagogy.	—The creation and interpretation of new knowledge, through original research, or other advanced scholarship, of a quality to satisfy review by peers at national and international levels; —Ability to demonstrate a significant range of the principal skills, techniques, tools, practices and/or materials which are associated with a field of learning; —Develop new skills, techniques, tools, practices and/or materials; —Respond to abstract problems that expand and redefine existing procedural knowledge; —Communicate results of research and innovation to peers; —Engage in critical dialogue; lead and originate complex social processes within their professional domain; critical competences, i.e. critical and self-critical abilities; —Presentation and defence in public of scientific studies; —Creativity.

Subject Specific Competences in Education Sciences

The following list of subject specific competences was developed by the Education Sciences working group and evaluated in a survey of former students, academics and employers.

Education Sciences

1. Ability to analyse educational concepts, theories and issues of policy in a systematic way.
2. Ability to identify potential connections between aspects of subject knowledge and their application in educational policies and contexts.
3. Ability to reflect on one's own value system.
4. Ability to question concepts and theories encountered in Education Sciences.
5. Ability to recognise the diversity of learners and the complexities of the learning process.
6. Awareness of the different contexts in which learning can take place.
7. Awareness of the different roles of participants in the learning process.
8. Understanding of the structures and purposes of educational systems.
9. Ability to do educational research in different contexts.
10. Counselling skills.
11. Ability to manage projects for school improvement/development.
12. Ability to manage educational programmes.
13. Ability to evaluate educational programmes/materials.
14. Ability to foresee new educational needs and demands.
15. Ability to lead or coordinate multidisciplinary educational teams.

Teacher Education

16. Commitment to learners' progress and achievement.
17. Competence in a number of teaching/learning strategies.
18. Competence in counselling learners and parents.
19. Knowledge of the subject to be taught.
20. Ability to communicate effectively with groups and individuals.
21. Ability to create a climate conducive to learning.
22. Ability to make use of e learning and to integrate it into the learning environments.

23. Ability to manage time effectively.
24. Ability to reflect upon and evaluate one's own performance.
25. Awareness of the need for continuous professional development.
26. Ability to assess the outcomes of learning and learners' achievements.
27. Competence in collaborative problem solving.
28. Ability to respond to the diverse needs of learners.
29. Ability to improve the teaching/learning environment.
30. Ability to adjust the curriculum to a specific educational context.

Consultation process with stakeholders

In the first phase of the Tuning project the Education Sciences Working Party consulted former students, employers and other Education academics to ascertain their views on the range of generic and subject specific competences that relevant to the subject areas of Teacher Education and Education Sciences. As noted above this consultation resulted in an indicative list of competences listed. The Working Group also consulted other academics from time to time during the Tuning phases one and two to elicit feedback from colleagues on issues as they arose, e.g. calculating student workload.

The professions related to Education are represented by a wide range of professional bodies, learned societies and regulatory bodies, many of which belong to European networks. Teaching Councils have now been established in several countries with remits similar to those of other regulatory professional bodies, such as Medical Councils. Where such Councils or other accrediting bodies exist, higher education institutions running teacher education and educational sciences programmes which require professional accreditation must consult with these bodies and facilitate accreditation visits. Student stakeholders include national student bodies who may have representation on review and accreditation boards at national level in many countries.

The close links between Teacher Education Programmes and field-based student placements have continuously provided opportunities to consult stakeholders, i.e. teachers in schools or school principals about the relationships between theory and practice, and regarding which parts of the Teacher Education programmes might be improved to better fit to the «realities of today's schools».

Other stakeholders include the users of educational services, e.g. parents, who, as «consumers» choose schools for their children in an increasingly market-oriented society, thereby putting pressure on schools and higher education institutions to respond to their demands and educate teachers accordingly.

Universities offering Education Science (possibly combined with studies in psychology, sociology, political science, journalism) are increasingly making use of questionnaires to former students, and consequently to their employers, to find out which professions they join, in order to be more targeted to the needs of the labour market.

Other stakeholders routinely consulted in teacher education and educational sciences are employers' groups such as national organisations of school principals or of educational psychologists, guidance and counselling organisations, teacher unions, ministry of education officials, local education administrators and so on.

4. ***Workload and ECTS***

It is difficult to outline this issue without differentiating between pre- and post- Bologna structures. The pre-Bologna first cycle may contain up to 300 ECTS equivalents, and new legislation leading to the figures noted below are only partially implemented. However, the following information has been collected from members of the Education Sciences working group. It should be borne in mind that Teacher Education presents an anomoly with regard to Bologna implementation.

Cycle	**ECTS Credits**
First cycle	*Teacher Education* 180 to 240 if wholly located at first cycle level; where divided between first and second cycles the total is concomitantly greater. For teaching at secondary school level, this may comprise a first degree of 180 to 240 plus a one-year Diploma course focused on preparation to teach of equivalent 60-80. This Diploma course may be a second cycle element, but in some countries it is a first cycle Diploma even though it is taken after a first cycle degree. For primary school qualified teacher status an integrated degree of 240 is more usual, although in some countries the consecutive model is also available for future primary school teachers, e.g. UK. *Education Sciences* 180-240

Cycle	*ECTS Credits*
Second Cycle	*Teacher Education & Education Sciences* 60-120. Not all countries have separate first and second cycle programmes yet, as noted above. The one-year Diploma noted above can be a second cycle qualification, but is not always weighted in terms of ECTS credits. In some countries, e.g. Greece, the term «teacher education» only exists at first cycle level, thereafter the term used for all is «Education Sciences».
Third Cycle	*Teacher Education & Education Sciences* 120 post second cycle where the second cycle award is linked to the doctoral work, otherwise, 180, normally associated with 3 years' full-time study. In many countries the length of doctoral studies has not yet been specified in terms of credits, and normal completion times may be as long as 4-6 years' full-time study or longer.

Trends and differences within the European higher education area in this subject area

Education and training are priorities of policies of the Council of the European Union. Strategic objectives for the development of education and training systems in the European Union have been defined and decisions taken on a detailed programme at European level. The European Commission, DG Education and Culture, sees teacher education and educational research as «vital» to the achievements of the Lisbon objectives. This position was reiterated at the Madrid Council meeting, and also in the joint Council and Commission report *Education & Training 2010*. Knowledge-based and dynamic learning societies depend on highly qualified education staff in a rich variety of contexts (e.g. lifelong learning, @-learning, inclusive education, university education). As a consequence, the initial education and continuous professional development of educators and those in education-related professions have become subject to rapid expansion, diversification and professionalization. Trends that have become apparent are:

- The role of Education academics in the preparation of university teachers. In 50 % of the countries represented in Tuning initial education for teaching is now essential for university teachers.
- Teaching in higher education institutions is also emerging as a distinct field of research.

— While there are apparent national differences at a surface level in Education Sciences and Teacher Education across the member states, there are as many similarities and commonalities at a deeper level structure. This makes the possibility of cross- European modules or courses feasible, and this is a trend that is beginning to be seen.
— Although traditionally, and currently in many countries, teacher education has been based on theoretical and practical knowledge, many governments are now prioritising classroom-based research, assuming that it will be directly relevant for educational practice. This has led to a growth in evidence-based practice as the informing philosophy of teacher education.
— Consequently a research component is included in programmes of initial teacher education in an increasing number of countries, although this element has not yet become an integral component of all models of initial teacher education in Europe at first degree level. However, a research component normally forms an integral aspect of all programmes at second cycle level.
— There is a growing trend in Education for part-time studies at all degree levels, especially for second and third cycles. This is associated with the parallel trend of self funding of post-first cycle study, already well established in some EU countries but spreading inexorably across Europe.
— The range of candidates entering Teacher Education is widening. Influenced by teacher shortage, economic downturns or altruism, mature professionals from other fields are turning to teaching. These candidates are normally educated to degree level in other subjects, and often obtain accredited entry to the Teacher Education programme they choose. There is evidence that such mature candidates are positively regarded by academics and employers.
— Professional doctorates are beginning to appear within Europe (UK, Ireland, Portugal). This may be the beginning of a trend related to the development of lifelong learning opportunities for professionals in the fields related to Education.
— Another trend within doctoral studies is a movement to limit the length of study to a reasonable number of years/workload (largely motivated by analysis of the real costs of supervision in universities)
— There is a growing trend to offer on-line elements of programmes at second cycle level, and to make use of internet resources as part of teaching and learning strategies.

5. ***Learning, teaching & assessment (TLA)***

Education Sciences are centrally concerned with TLA, with many academics having a strong practitioner background. It has also long been the tradition for academics in Education Sciences to consciously demonstrate good practices in their own teaching. The Tuning approach of developing curricula and approaches to TLA around student competences is already well established in areas of Education such as Teacher Education, and valuable pedagogical practices founded on principles of adult learning and competence development have evolved. What are listed below are three indicators of good practices taken from Education Sciences which may have wider relevance across other disciplines.

Best practice

Observation skills development (First or second cycle learning and teaching)

Competences developed:

—Ability to analyse complex situations of human learning and development in particular contexts, including their own learning;
—Describe objectively what is observed, categorize and analyse this, and make theoretically well founded evaluations based on the observed incidents;
—Appreciate how own values and beliefs can influence how incidents are observed;
—Use evidence from reading and research to support development of analysis and evaluation.

Method of TLA:

This is a method often associated with a task-based or problem-based approach to teaching and learning.

Observation is a key element of work placements and school practice. Practice in developing the different competences making up observation skills can begin with very concrete, easily observed and easily described (low inference) phenomena (who talks to whom, how many times does x occur, etc.) and gradually include events much less easy to «see» or describe (high inference), such as what kinds of roles people are playing, what the aims of an activity is.

From tutor led observation activities, students can then move to real time observation in their placement area. Each early observation task is followed by an exercise in reflection in which students are required to share descriptions, categorise phenomena (analysis) and evaluate what has been observed and the role of their own values in influencing how they observe. Literature search is an important part of the follow up, particularly at second cycle level. Placement observations also have follow-up sessions with peers and placement tutors.

Portfolio assessment (first and second cycle learning and assessment

Competences developed:

—Reflection;
—Autonomous decision making as part of self directed learning:
—A range of competences appropriate to the unit or programme which is the basis of the portfolio.

Method of TLA:

Portfolio assessment normally forms part of a programme of study or section of a programme rather than a single module, and is based on a purposeful sample of student work, selected on the basis of defined criteria related to the competences focused upon. Portfolios are constructed to highlight and demonstrate students' knowledge and skills in a range of competences. The portfolio also provides a means for reflection, offering the opportunity for auto-critiquing the student's own work and evaluating the effectiveness of interpersonal interactions in selected contexts.

A typical use might be on work placements, where the portfolio provides a record of the student's engagement with a range of learning activities. The completed portfolio may later be used to support preparation for job interviews.

Portfolios are usually selections of the total collection of data collected by the student (which may include assessed work, artefacts, learner profiles, diaries etc.) and demonstrate the *development* of competences over time. More recently IT has been used to produce web-based portfolios to demonstrate student development of IT skills as well as other competences.

Research Methods (Training second and third cycle teaching, learning and assessment)

Competences developed:

—Understanding of research methods and the paradigms in which they fit;
—Familiarity with a range of commonly used methods in educational research, and
—Practice in how to set these up, analyse data etc;
—Ability to develop feasible and researchable questions and select appropriate methods of researching them.

Method of TLA:

In Education most students undertake independent research projects, and do not work as part of a research team. Coming from working backgrounds outside academia, many require initial support in developing an appropriate research proposal. Typical macro activities are:

—discussing the nature of educational research; giving and seeking information about the main approaches to research in educational research;
—examining the nature of research questions;
—discussing the main methods, techniques and instruments used to collect and analyse data, in accordance with the object and objectives of a particular research;
—discussing how to design a research plan.

Students engage in a range of practical activities, such as defining research questions and objectives; developing appropriate instruments for data collection; developing and using methods of analysis for analysis of data, researching methods in the literature and evaluating their relevance to their own needs. The assessment achievement is based on a student developed research plan often used later as the basis for their research proposal.

6. *Quality enhancement*

One of the distinctive ways in which both Teacher Education and Education Sciences can enhance the quality of their programmes is through active partnerships with employers and professional bodies. The former, through collaboration in work placements, turn a practical eye on the relevance of courses to the social needs of the time. The latter, through their gate keeping and regulatory functions may ensure that standards are upheld at national and, increasingly, international levels. Such interaction with external partners is not yet true in all EU countries.

Academics from Education departments and faculties participate or lead in most research into the processes of quality assessment and enhancement in higher education (as well as other sectors of education) and so practices in Education are based on evidence.

The processes of quality assessment are rather complex and therefore demand a variety of tools and participants. Consequently students are increasingly involved in quality assurance and improvement processes as part of their development as reflective practitioners.

A wide range of internal monitoring procedures are fed into open systems where implications for improvement are discussed, such as student satisfaction questionnaires; student discussions and focus groups, staff views, reviews of student assessment etc.; annual programme review which may include students as well as the teaching team; non-judgemental peer observation. In some countries (e.g. UK, Ireland) external examiners at all degree levels are involved in this process to some extent.

In many Education departments, academic staff undertake continuing professional development through attendance on short courses, conferences and seminars. Teacher education for university teachers is becoming a common way of improving quality as part of a continuing learning strategy used by many institutions.

External evaluation by national quality assurance agencies, developed on a consultative basis, provides a focus for departmental and personal reflection and improvement, although most educationists in the European Tuning group favour a light external touch. It was felt that external agency evaluations are too often linked to future funding and «value for money» or to the impressions of the political moment rather than to enhancement of student learning.

2.2.5. **European Studies**

1. ***Introduction to the subject area***

European Studies is focused on the analysis of national and transnational developments in the European continent as a whole and is both multi-disciplinary and inter-disciplinary in approach (see below). While there is variation in the disciplinary composition of the degrees, the typical subjects include law, economics, politics and international relations, history, sociology, business administration. There are also differences in the structure, content and approach to teaching / learning, both according to national traditions and the Faculty/Department in which the degrees developed (for example, Law, Economics or Politics). Finally, there are currently some differences of emphasis between the programmes in the new member states (and applicant countries) on the one hand and longer term members on the other, since there is a more urgent need for training on European integration in the former. However, there are also very considerable similarities in the objectives of the degrees and the competences they seek to foster. It is also important to note that European Studies is a relatively young subject area and new developments may be expected as a result of experience over time and mutual learning from academic staff in the different countries. Yet the European Studies subject group also believe that the diversity of approaches is beneficial and that it would be a great mistake to attempt to impose any uniformity of provision.

2. ***Typical degree profiles and occupations***

Typical degrees offered in European Studies

Cycle	Typical degrees offered
First	Generally two different groups of typical degree may be identified: —Bachelors in European Studies (with support and specialization courses in subject specific areas, for example law, politics, economics, history, business administration, sociology, etc.). —Bachelors in a subject specific area (e.g. law, arts, economics, history, business administration, sociology, etc.) with specialization in European Studies.
Second	Again two different groups of typical degrees may be identified: —Masters in European Studies (with support and specialization courses in subject specific areas, for example law, politics, economics, history, business administration, sociology, etc.). —Masters in subject specific areas (e.g. law, politics, economics, history, business administration, sociology, etc.) with specialization in European Studies.
Third	—Generally there is not a Ph.D. cycle in European Studies and students tend to study for doctorates in specific subjects. However, there are many doctorates on topics within the field of European integration, drawing on more than one discipline, and doctoral students are often based within Departments, Centres, etc. of European Studies.

Typical occupations of the graduates in European Studies (map of professions)

Cycle	Occupations
First	Public sector & governmental agencies, NGOs (national and international), international organisations and European institutions, business and other private sector, media and information centres.
Second	Public sector and governmental agencies, NGOs (national and international), European institutions and international organisations, education, research, political organizations, business and other private sector, media and information centre.

Role of subject area in other degree programmes

Degree programmes in many subject areas, especially in law, politics, economics, history, sociology and business administration include courses dealing with European issues. Specialists on European integration are also often asked to provide relevant courses in such programmes, particularly as a result of the Europeanisation of the curriculum. These courses may be of a general character at a relatively introductory level (particularly in bachelor degree programmes) or maybe of a specialist nature —for example, on aspects of European integration studied within a particular discipline.

3. *Learning outcomes & competences - level cycle descriptors*

As noted above European Studies is both multi-disciplinary and inter-disciplinary and the two may be distinguished as follows: «multi-disciplinary» designates a course in which a number of disciplines relevant to, or constitutive of, European Studies are studied in parallel; «inter-disciplinary» indicates a course in which some or all of these disciplines are brought into sufficiently close contact for a synthesis to take place. There are various pedagogic and practical challenges in facilitating the students' progress in acquiring these competences, but the most typical pattern through the cycles may be shown as:

- The first cycle model proceeds from a first part in which relevant component disciplines are studied in parallel. After adequate induction, perhaps of one or two full-time years, the course ends with a moment of integration or synthesis, in which all disciplines inform each other in an appropriate pedagogic and methodological environment.
- If the second cycle recruits students who have successfully completed a first cycle course of the type above, it can be wholly inter-disciplinary.
- If, however, it caters for students who have graduated via single-subject routes, it will proceed from multi- to inter-disciplinary studies, by analogy with the first cycle programme, albeit at a higher level.

However, there are significant variations in approach. For example, in Sweden the pattern is inverted. Thus during the first two years of the first cycle, the emphasis is on inter-disciplinary study of a particular problem or set of issues, with greater disciplinary specialization at later stages. Nevertheless, all the programmes seek —to a greater or lesser extent— to provide both multi-disciplinary and inter-disciplinary learning outcomes.

Because of the variation in the disciplinary combinations of the degree programmes, and because some students take Masters degrees in European Studies, without having previously taken a Bachelors degree in the subject area, it is difficult to differentiate precisely between the first and second cycle subject descriptors. However, the second level descriptors emphasise a deeper level of attainment, with a greater emphasis on research.

First cycle level descriptors
After the completion of first cycle, students in the area of European Studies should be able to: a. work in an interdisciplinary area; b. communicate orally in their own and an international language using the appropriate terminology; c. show understanding of the multi-disciplinarity of the area and the connections between its disciplines; d. demonstrate understanding of ideas and concepts of Europe and European integration; e. demonstrate understanding of European institutions and decision making processes.
Second cycle level descriptors
After the completion of the second cycle, students in the area of European Studies should: a. have an ability to interpret European events, developments and policies in national, regional and local frameworks; b. have an ability to use different disciplinary methodologies in an integrated way; c. have sufficient competences to do guided research; d. have an ability to work independently; e. be able critically to follow and interpret EU policies; f. be able critically to follow and interpret ideas and concepts of Europe and European integration; g. have an ability to communicate orally in their own and an international language using the appropriate terminology; h. have international mobility and cultural understanding. *Note.* The identification of descriptors for the first and second cycle is based on the presumption of the existence of both bachelor and master levels. However at some universities European Studies programmes take place either only at the first cycle level or only at the second cycle level. In these cases the specific level descriptors may be slightly modified.

Consultation process with stakeholders

There are now several academic and professional bodies in the European Studies area. In particular, there are national European Community Studies Associations (ECSA) in most European countries and there are also periodic ECSA World Conferences. The Jean Monnet programme has created Chairs and Centres of Excellence and has facilitated the development of modules in European integration throughout the world. In addition, there are several other bodies concerned with specific issues of relevance, such as the International Society for the Study of European Ideas. All these national and transnational bodies, bringing together specialists in the field, contribute to the enrichment of the European Studies curriculum. At the same time, there is an ongoing debate about «European issues» within particular subject areas, particularly because of the growing importance of the European Union and the increasing need for an awareness of European issues. The mutual interactions between academics and stakeholders in the public and private sectors and in NGOs people, state representatives etc.) also feed into the development of the subject area.

4. ***Workload and ECTS***

The workloads for degree programmes expressed in European Studies are typical for those in the ECTS system as a whole.

Cycle	**ECTS Credits** (25-30 student working hours)
First	Mostly 180 and in few instances 240
Second	60, 90 or 120 (normally)
Third	Mostly a PhD programme with a duration of three years

Annex

The Core Curriculum for European Studies

The following competences should be considered as a core for first and second cycle of European Studies:

—Core of European Studies for first cycle:

- Knowledge of ideas/concepts of Europe.
- Knowledge of European integration.
- Knowledge of European institutions and decision making policies.
- Knowledge of EU policies.
- Europe in the world.
- Ability to work on an interdisciplinary area.
- Ability to communicate orally in own and an international language using the appropriate terminology.

—Core of European Studies for second cycle:

- Knowledge of ideas/concepts of Europe.
- Knowledge of European integration.
- Knowledge of European institutions and decision making policies.
- Knowledge of EU policies.
- Europe in the world.
- Ability to use different disciplinary methodologies in an integrated way.
- Ability to interpret European events, developments and policies in national, regional and local frameworks.
- Ability to communicate orally in own and an international language using the appropriate terminology.

2.2.6. **History**

1. ***Introduction to the subject area***

On the simplest plane History is the study of the past. It is widely present in higher education institutions as well as in schools. It constitutes not only an academic subject or research area, but also an important aspect of «general culture». Above all, a training in History creates flexible individuals with the analytical, critical and communications skills essential to the emerging knowledge society.

In the context of European enlargement and today's rapidly changing world, History faces both particular challenges and remarkable opportunities. As one of the first forms of social consciousness and group and regional identity it is an important factor of social cohesion. Indeed, History properly understood and utilised can enable us to

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overcome the aggressive confrontations which have set nations and groups against one another.

Of all the subject areas involved in Tuning, History has turned out to present the most varied picture in the different countries represented. National university and school systems determine a context in which quite naturally a large part of «contents» taught in each country linked to the national culture or vision of the past; furthermore, the History group has found that the theoretical and practical premises created by each national culture and teaching tradition differ, often very sharply. Hence the structure of studies, and ideas about what should be done at the beginning of degree programmes and what at a more advanced stage are quite different. For this reason, the History group did not consider it possible or useful to identify a core curriculum, but rather to create agreed reference points, based on both subject specific and key generic competences, around which programmes can be built in all countries.

Not only the intellectual premises of studies, but also the perceived role of history graduates in various European countries differs widely. In some countries a first or second cycle degree in History is a common general degree, often completed by young men and women who do not plan a career in history teaching or research. In others it continues to be considered to be of interest almost exclusively for future school teachers or as pre-doctoral preparation for university level academics and researchers. In the former, history studies seem to be in good health or even in expansion. In the latter, there is pressure to reduce the number of history students according to the availability of teaching posts.

2. *Degree profiles and occupations*

Typical degrees offered in History

Degree	Typical degrees offered
First Cycle	Most commonly, institutions offer specific first cycle degrees in History, although in some cases History students simply take a more general degree (Arts, Letters or Humanities for example), giving particular attention to historically oriented course units. In some countries Art History or other related subjects are considered to be part of the subject area; in others they are separate. In the different academic and cultural contexts History may be linked to other major subject areas such as Philosophy, Geography, Literature, Archaeology, Classical studies, Archival studies, Economics, Law or Library Sciences.

Degree	*Typical degrees offered*
Second Cycle	Second cycle degrees in History are frequently offered. In almost all cases the work leading to a second cycle degree comprises both course work and a relevant piece of research presented in written form. Second cycle degrees may be in a specific chronological or thematic area. In some countries and some institutions this is specified in the degree title (e.g. Medieval or Contemporary History; Women's History). In others the usual title is simply History, although the programme of studies depends on the area of particular emphasis. There are often second cycle degrees in such subjects as Economic History, or in History related subjects such as Archival studies, Museology, Archaeology and so forth. In some countries future teachers of History receive specific degrees; in others the degree continues to be in History and teacher training is either included or is taken as a separate study programme.
Third Cycle	Doctorates are normally in History (or in a sub or related discipline such as Economic History or History of Law). They require examination and defence of a substantial and original piece of research described in dissertation which normally has the dimensions and typology of a scientific monograph. The taught component of the degree varies, although at present in several countries the proportion is under discussion.

Typical occupations of the graduates in History (map of professions)

Cycle	**Occupations**
First Cycle	First cycle degrees in History are useful for employment in nearly any service or communications related field: civil service, local, regional administration, personnel management, journalism, international organisations, tourism, administration and valorisation of the cultural patrimony in its various manifestations including archives, museums, libraries.
Second Cycle	Second cycle degrees in History according to the specifics of the national organisation of studies may give access to employment in secondary or even higher education. They also give a good basis for positions of greater responsibility in all the sectors mentioned for the first cycle.
Third Cycle	In most cases the doctoral degree in History is associated with an academic or research role.

Role of subject area in other degree programmes

A significant part of History learning and teaching takes place in other degree programmes. For this reason the History subject area group carried out its consultations and defined competences and levels taking into account the case of even a single course unit.

Most Arts and Humanities programmes include the requirement that students complete some history course units, even a very small number of credits such as five. Particularly in the disciplinary areas that are related to History (different in different national traditions) such as Geography, Philosophy, Literary or Linguistic Studies, Art History, Archaeology, Archival Studies, Communications there are requirements for History courses. In some scientific and technological subjects or subjects such as Architecture or Law, there may be a requirement that students take a History course, or History may be an optional or elective course. History, particularly Contemporary History and non-European History is usually a requirement for Political Science degrees, and is also present in «area» or European studies, in Tourism and Journalism courses.

3. ***Learning outcomes & competences - level cycle descriptors***

Type of studies	**Description of achievement**
History courses* for students of other subject areas *By course we intend a learning activity leading to assessment and credits.	A course (or courses) in History, which constitute a minor component of a degree in another subject should enable the student (to the extent possible in the time available) to develop a historical perspective on reality. This should include acquiring or experiencing: 1. A critical view of the human past, and the realization that the past affects our present and future and our perception of them. 2. Understanding of and respect for viewpoints moulded by different historical backgrounds. 3. A general idea of the diachronic framework of major historical periods or events. 4. Direct contact with the historians' craft, that is, even in a circumscribed context, contact with original sources and texts produced by professional historiographical research.

Type of studies	*Description of achievement*
History as a relevant part of a degree in other or more general subjects (minor or double honours degree, degree in Letters, part of a teaching degree etc.)	All of the above remain the general objectives. The level expected will be higher, the contents more ample and detailed, the experience of different methodologies and historiographical tools greater according to the amount of historical studies permitted in the study course organization. In any case, to obtain mention of a relevant presence of historical studies in a degree, the student who has completed such a study programme should: 1. Have general knowledge of the methodologies, tools and issues of at least two of the broad chronological periods into which history is normally divided (such as Ancient, Medieval, Modern and Contemporary) as well as some significant diachronic themes. 2. Should have demonstrated his/her ability to complete, present in oral and written form —according to the statute of the discipline— a circumscribed piece of research in which the ability to retrieve bibliographical information and documentary evidence and use it to address a historiographical problem is demonstrated.
History for first cycle History Degrees	The general objectives remain as above; however the student at the end of a first level History degree should furthermore: 1. Possess general knowledge and orientation with respect to the methodologies, tools and issues of all the broad chronological divisions in which history is normally divided, from ancient to recent times. 2. Have specific knowledge of at least one of the above periods or of a diachronic theme. 3. Be aware of how historical interests, categories and problems change with time and how historiographical debate is linked to political and cultural concern of each epoch. 4. Have shown his/her ability to complete and present in oral and written form —according to the statute of the discipline— a medium length piece of research which demonstrates the ability to retrieve bibliographical information and primary sources and use them to address a historiographical problem.

Type of studies	*Description of achievement*
History for a second cycle History Degree	A student completing a second cycle degree in History should have acquired to a reasonable degree the subject specific qualities, skills and competences listed below (Annex A). He/she will have built further on the levels reached at the first cycle so as to: 1. Have specific, ample, detailed and up-to-date knowledge of at least one great chronological division of history, including different methodological approaches and historiographical orientations relating to it. 2. Have acquired familiarity with comparative methods, spatial, chronological and thematic, of approaching historiographical research. 3. Have shown the ability to plan, carry out, present in oral and written form —according to the statute of the discipline— a research-based contribution to historiographical knowledge, bearing on a significant problem.

Consultation process with stakeholders

The initial consultation carried out in the Tuning 1 phase was, as with all subject area groups, directed towards graduates, employers and academics. Our consultation had two three specific characteristics: 1) because a large percentage of graduates in History are not employed in work directly related to History, there were complexities in identifying employers of History graduates; 2) because we were able to work with the History Thematic Network, academics from all present member states and candidate countries were consulted: 3) because History studies foster generic competences which are of interest for citizenship and personal satisfaction as well as employment we included three of these in our generic competence consultation, and we found that they were indeed considered very important by graduates, employers and academics.

The Tuning results at all stages have been shared and discussed with the History Thematic Network (CLIOHnet) members and illustrated and discussed in national contexts in all countries eligible for Socrates. At present such meetings continue and through the member institutions of the History Network associations and reviews are involved in the discussion and hence the validation of the results. In the countries where curricula are now being reformed according to the Bologna structures, specific recommendations based on Tuning-CLIOHnet results have been applied.

4. *Workload and ECTS*

Cycle	ECTS Credits
First	180 is the most common, although some programmes use the 240 model for the first cycle.
Second	Most common is 120
Third	Credits are not always used. The minimum for a third cycle degree is generally three years although in some countries the period of study is longer, de jure or de facto. The variation in the overall time required seems to be in relation to whether the completion of the third cycle degree and the approval of a substantial research dissertation is seen as a sine qua non to begin an academic career or whether, as is the case in some countries, it is possible to have a University teaching or research post while working towards the third cycle degree. In the latter case the process may take longer as the programme of study and research is not full-time.

5. *Learning, teaching & assessment*

The Subject Area has found that in various countries there are widely different systems for creating the appropriate learning environments for the acquisition of key competences in History. It seems clear that each national system has its own coherence and internal balance, in which, within the normal conventions of University learning-teaching-and assessment in each country, professors and students develop specific strategies for developing the necessary competences. This means that each system is to a large extent self-contained, and that partial or episodic imports of particular features from other systems may not have the desired results. It follows that the examples of «good practice» indicated below have been selected among the many possible to show a variety of approaches.

Hence there is no prescriptive intent in listing certain examples of good practice. Rather, overall, the Subject Area agrees on certain principles to be applied in all countries:

— that each student should experience many different approaches to learning and teaching, both because this is the best way to provide appropriate environments for students who may learn more or less successfully in various contexts; and because the different generic competences are formed in different teaching and learning environments;

—that teaching of History must not be separated from research: from the most general and elementary course unit in History, to highest level of research training, the learner must have direct contact, even if quantitatively limited, with original documents and with professional historigraphical work.

Clusters of competences	**Approaches to learning/teaching and assessment**
Basic general knowledge of the subject Analysis and synthesis Awareness of differences in historigraphical outlook in different periods Awareness of the on-going nature of historiographical debate Ability to identify historical problems Capacity to find new ways of using sources Capacity to connect and compare	[Bologna] Case studies are presented in lectures on the basis of the personal research of the teacher or using examples from scientific journals, of how historiographical problems can be identified; different methodologies for resolving them are discussed. Ways in which the discovery of new documentation influences understanding of existing sources are highlighted. In small group seminars, students are asked to look for sources of information for a given historical problem; they are also asked to define historical problems by themselves. Students are shown that all possible solutions and sources must be considered even if these contradict the working hypothesis. Thus intellectual honesty and the use of scientific method are encouraged. Students are required to work out their own hypotheses with rigorous scientific method. Students are asked to compare and connect the methodology and knowledge acquired in different subjects in order to be able to transfer innovative practice from one field to another. Students are asked to define a problem, identify sources, analyse them rigorously and give their results in written form. Whereas in the seminars the discussion is not assessed, in order to produce an environment of maximum openness and intellectual exchange, the written results are assessed for clarity, coherence and method; and the final exam is an oral exam where the student discusses general and specific questions with both the teachers and other staff members. In this context it is possible to both assess what has been achieved and guide the student in understanding critically the full implications of the results.

Clusters of competences	Approaches to learning/teaching and assessment
Awareness of the necessity of analysing any information, view, source or method critically; Awareness of the complex nature of information, attitudes and values Ability to express critical views in a constructive way Ability to think of one's own values, practices and perspectives critically	[Turku] Students take a first course in historiography. It focuses on the characteristics of «knowing» the past and at the same time shows how values, knowledge and views are connected to cultural contexts and so change over time. The initial course is a lecture course but includes exercises and discussion on examples of historiographical texts taken from different centuries. In methodological courses critical and self-critical thinking is encourages and assessed. After the initial stages of study, students participate in seminars (writing critical analyses of sources in their papers and expressing constructive criticism orally when their papers and those of other students are presented. In the second year pro-seminar, each student has to take the role of «opponent» or critical discussant of the research paper of another student and to lead a seminar discussion. Courses are usually assessed through written examinations (two or three essays written during an exam session of several hours. Assessment is on the basis of the research papers, discussion and the written exam.
Critical and self-critical abilities. A critical awareness of the relationship between current events and processes and the past Awareness of and respect for points of view deriving from other national or cultural backgrounds.	[CLIOHnet] The History Network has placed on line (www.clioh.net) a unit form of experimental web-based materials under the title «Core of the Core». The module requires from 50 to 60 hours of time for the normal student, and hence can be considered to carry 2 ECTS credits. The materials be used as an intensive unit to be offered over a very short period of time; they can be utilised by themselves for e-learning, for group work or as a base for classroom teaching/learning; they used as the introductory part of a larger module, or broken up into separate teaching units. The specificity of the learning environment «Core of the Core» lies in its pan-European and comparative character. The materials themselves are the result of collaborative work of teachers and students from the many countries participating in Socrates. They are designed to stimulate students to compare other national views of history with their own. We may note that further work on Tuning competences and reference points in e-learning is being carried out in CLIOHnet Task Force C and in the e-HLEE pilot project, coordinated by the University of Turku for the History Network.

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To conclude, we emphasize that one of the most useful aspects of Tuning is the sharing of knowledge and experience about approaches to learning and teaching. Especially in all situations where mobility of staff or shared experience can take place (Socrates mobility, Intensive programmes) staff and students can achieve a much higher degree of understanding of their own systems, their strengths and weakness, and or the usefulness of certain solutions used in other countries. It is significant that on the competences to be formed, including the overarching general competences which should be the objective of any History studies, however circumscribed, all members of the Subject Area Group and all those consulted are very much in agreement. The paths utilised to achieve those ends are, however, strikingly different.

A final aspect which deserves mention is that it seems to be very useful to share knowledge among different subject areas on how to foster, encourage and assess the generic competences.

6. *Quality enhancement*

History Subject Area reference points and competences have developed in close synergy with actual on-going debate on quality of programmes and delivery. The possibilities of direct interaction have been particularly incisive because members of the subject area have been able to interact with the History Thematic Network, gathering experience in the use of Tuning tools in programme design, delivery, monitoring and improvement. On the one hand, in the many countries where the Bologna process was being applied, members of the Subject Area Group were involved in drawing up new programmes based on competences and learning outcomes, and in building in useful elements for ensuring quality. Thus they could bring their concrete experience to the Subject Area Group; on the other hand, the pan-European results (reference points, competences, shared knowledge about learning, teaching and assessment) of Tuning could be used and evaluated in local and national contexts.

Furthermore, the History Subject Area Group, through the History Thematic Network, CLIOHnet, had the important opportunity of being able to participate in the TEEP 2002 project supported by the European Commission and carried out by ENQA (European Network of Quality Assurance Agencies). The TEEP 2002 project allowed us to test the applicability of our Tuning findings in a «hands-on» quality assurance context. The project consisted of an experiment in transnational evaluation, based on Tuning criteria and reference points, in which five CLIOHnet institutions carried out a self-evaluation exercise; subsequently site visits were made by Tuning-CLIOHnet members working in cooperation with QAA. This experience gave useful practical knowledge about non-invasive, non-prescriptive ways of furnishing institutions with a methodology and support to develop quality. The History Network is now engaged in making these findings available to its member institutions and to other institutions.

Annex

History Subject area subject specific competences

List of Subject Specific Skills and Competences for History

Please note: the following is the list of 30 subject specific competences on which we based our consultation with academics. It is designed to suggest a broad array of competences which might be used in designing curricula and course units. It does not include all the competences which might be kept in mind in designing programmes and course units; it is not expected that any one student *will develop all the competences listed.*

1. A critical awareness of the relationship between current events and processes and the past.
2. Awareness of the differences in historiographical outlooks in various periods and contexts.
3. Awareness of and respect for points of view deriving from other national or cultural backgrounds.
4. Awareness of the on-going nature of historical research and debate.
5. Knowledge of the general diachronic framework of the past.
6. Awareness of the issues and themes of present day historiographical debate.
7. Detailed knowledge of one or more specific periods of the human past.
8. Ability to communicate orally in one's own language using the terminology and techniques accepted in the historiographical profession.
9. Ability to communicate orally in foreign languages using the terminology and techniques accepted in the historiographical profession.
10. Ability to read historiographical texts or original documents in one's own language; to summarise or transcribe and catalogue information as appropriate.
11. Ability to read historiographical texts or original documents in other languages; to summarise or transcribe and catalogue information as appropriate.
12. Ability to write in one's own language using correctly the various types of historiographical writing.
13. Ability to write in other languages using correctly the various types of historiographical writing.

14. Knowledge of and ability to use information retrieval tools, such as bibliographical repertoires, archival inventories, e-references.
15. Knowledge of and ability to use the specific tools necessary to study documents of particular periods (e.g. palaeography, epigraphy).
16. Ability to use computer and internet resources and techniques elaborating historical or related data (using statistical, cartographic methods, or creating databases, etc.).
17. Knowledge of ancient languages.
18. Knowledge of local history.
19. Knowledge of one's own national history.
20. Knowledge of European history in a comparative perspective.
21. Knowledge of the history of European integration.
22. Knowledge of world history.
23. Awareness of and ability to use tools of other human sciences (e.g., literary criticism, and history of language, art history, archaeology, anthropology, law, sociology, philosophy etc.).
24. Awareness of methods and issues of different branches of historical research (economic, social, political, gender related, etc.).
25. Ability to define research topics suitable to contribute to historiographical knowledge and debate.
26. Ability to identify and utilise appropriately sources of information (bibliography, documents, oral testimony etc.) for research project.
27. Ability to organise complex historical information in coherent form.
28. Ability to give narrative form to research results according to the canons of the discipline.
29. Ability to comment, annotate or edit texts and documents correctly according to the critical canons of the discipline.
30. Knowledge of didactics of history.
31. Other (specify).

2.2.7. **Mathematics**

1. ***Introduction to the subject area***

Mathematics, because of its abstract nature, is applicable to almost any discipline, since it identifies patterns that are common to many different areas. As a discipline its roots can be traced back through all the major civilisations to the earliest recorded human works. While it originated as a systematisation of the solutions of practical problems in areas such as land surveying (hence geometry), construction, war and commerce, it evolved with the realisation that abstraction of the essentials led to generalisation of the applications and hence became a science which uses rigorous deduction to arrive at solid conclusions from clearly stated assumptions.

Mathematics is fundamental, not only to much of science and technology, but also to almost all situations that require an analytical model-building approach, whatever the discipline. In recent decades there has been an explosive growth of the use of mathematics in areas outside the traditional base of science, technology and engineering, for example, in finance, biology and computer science.

Statistics as a discipline within mathematics arose from probability and developed in the nineteenth century with the growth of «official statistics». It now encompasses the whole science of collecting, analysing and interpreting data and the design of observational and experimental studies. It plays a major and increasing role, *inter alia*, in medicine, quality control and management, physical and social sciences, business and economics.

Programmes in mathematics vary from the very pure or theory based to the very applied or practice based. Some are broad, while others allow specialisation in particular areas, such as statistics or financial mathematics. They all share the key learning outcomes detailed below.

2. ***Degree profiles and occupations***

Typical degrees offered in Mathematics

Cycle	**Typical degrees offered** (name subject area / specific parts)
First	—Mathematics —Applied Mathematics —Mathematical Physics —Mathematics and Statistics —Mathematics and Education —Financial Mathematics/Mathematical Finance —Mathematical Engineering
Second	—Mathematics —Statistics —Financial Mathematics —Mathematical Engineering —Mathematics and Education —Biomathematics
Third	—Any specialised area of Mathematics

Typical occupations of the graduates in Mathematics (map of professions)

Cycle	Occupation		
	Programme Profile	Category / Group of professions	Example professions
First	Mathematics	Industry	Management consultant
	Mathematics	Industry	Modeller
	Mathematics	Government	Meteorologist
	Mathematics with Education	Education	Secondary school teacher of Mathematics
	Mathematics specialising in statistics	Industry/Government	Statistician
	Mathematics (possibly specialising in finance, statistics or economics)	Banking/Insurance	Actuary, Banker, Accountant
	Mathematics with significant computer science	Industry/Banking	Software analyst
Second	Mathematics (any specialism)	University	Early Stage Researcher/ Teacher
	Mathematics	Industry	Management consultant
	Mathematics	Industry	Researcher/Modeller
	Mathematics	Government	Meteorologist
	Mathematics with Education	Education	Secondary school teacher of Mathematics
	Mathematics specialising in statistics at second cycle	Industry/Government	Statistician (higher entry level)
	Mathematics specialising in finance, statistics or econometrics at second cycle.	Banking/Insurance	Actuary, Banker, Accountant
	Mathematics with specialisation at second cycle	Industry/Defence Industry	Researcher

Cycle	*Occupation*		
	Programme Profile	*Category / Group of professions*	*Example professions*
Third	Mathematics (any specialism)	University	Researcher/Teacher
	Mathematics	Industry	Management consultant
	Mathematics	Industry (Pharmaceutical /Aeronautical/Electronic etc)	Researcher/Modeller
	Mathematics	Government	Meteorologist
	Statistics	Industry, in particular biotechnology and medicine	Researcher/Teacher
	Financial or actuarial mathematics	Banking/Insurance	Actuary/Banker
	Algebra /Number Theory/Discrete Mathematics	Government	Researcher/cryptologist

Role of subject area in other degree programmes

Mathematics is an essential component of all engineering and most science courses, in particular physics, but also chemistry and, increasingly, biology. Some mathematics units are included in most courses in business studies and economics; statistics has particular importance in these areas and also in programmes in the humanities where no other mathematics courses may form part of the programme.

It is also commonly occurs as one subject in a two subject degree, such as Mathematics and Economics, Mathematics and Computer Science, Mathematics and Biology, Mathematics and Physics.

3. *Learning outcomes & competences - level cycle descriptors*

The «Dublin descriptors» describe the generic competences that are expected to be developed in the first, second and third cycles. Mathematics programmes would be expected, of their nature, to develop competences such as «devising and sustaining arguments and solving problems», while there is a growing awareness of the need to develop communications skills. Similarly, the generic competences identified as most important in the Tuning survey: capacity for analysis and synthesis, capacity to learn and problem solving should all be developed naturally during each of the three cycles. Thus, the generic «Dublin descriptors» and the key Tuning generic competences are assumed at all three cycles, and subject specific descriptors are suggested here for first and second cycles.

The key skills expected of any mathematics graduate are:

- the ability to conceive a proof,
- the ability to model a situation mathematically,
- the ability to solve problems using mathematical tools.

Arising from a survey of academics some subject specific competences were ascribed to each of the first two cycles and are listed here together with suggested cycle and level descriptors.

First cycle	Key subject specific competences	Key generic competences
Cycle descriptor: On successful completion of a first cycle degree in Mathematics, students will be able to: — show knowledge and understanding of basic concepts, principles, theories and results of mathematics; — understand and explain the meaning of complex statements using mathematical notation and language; — demonstrate skill in mathematical reasoning, manipulation and calculation; — construct rigorous proofs; — demonstrate proficiency in different methods of mathematical proof.	**Level 1** *Content.* The Mathematics all scientists should know: basic algebra and arithmetic, linear algebra, calculus, basic differential equations, basic statistics and probability. *Learning outcomes*. To complete level 1, students will be able to (a) understand some theorems of Mathematics and their proofs; (b) solve mathematical problems that, while not trivial, are similar to others previously known to the students; (c) translate into mathematical terms simple problems stated in non-mathematical language, and take advantage of this translation to solve them. **Level 2** *Content.* Basic theory of the main «mathematical subjects» including most, preferably all, of the following: — basic differential equations — basic complex functions — some probability — some statistics — some numerical methods — basic geometry of curves and surfaces — some algebraic structures — some discrete mathematics. *Learning outcomes.* To complete level 2, students will be able to (d) provide proofs of mathematical results not identical to those known before but clearly related to them; (e) translate into mathematical terms problems of moderate difficulty stated in non-mathematical language, and take advantage of this translation to solve them; (f) solve problems in a variety of mathematical fields that require some originality; (g) build mathematical models to describe and explain non-mathematical processes.	— Profound knowledge of «elementary» mathematics (such as may be covered in secondary education). — Ability to construct and develop logical mathematical arguments with clear identification of assumptions and conclusions. — Capacity for quantitative thinking. — Ability to extract qualitative information from quantitative data. — Ability to formulate problems mathematically and in symbolic form so as to facilitate their analysis and solution. — Ability to design experimental and observational studies and analyse data resulting from them. — Ability to use computational tools as an aid to mathematical processes and for acquiring further information. — Knowledge of specific programming languages or software.

Second Cycle	Key subject specific competences	
Cycle descriptor: *Learning outcomes*. On successful completion of a second cycle degree in Mathematics, students will be able to: — read and master a topic in the mathematical literature and demonstrate mastery in a reasoned written and/or verbal report; — initiate research in a specialised field.	— Facility with abstraction including the logical development of formal theories and the relationships between them. — Ability to model mathematically a situation from the real world and to transfer mathematical expertise to non-mathematical contexts. — Readiness to address new problems from new areas. — Ability to comprehend problems and abstract their essentials. — Ability to formulate complex problems of optimisation and decision making and to interpret the solutions in the original contexts of the problems. — Ability to present mathematical arguments and the conclusions from them with clarity and accuracy and in forms that are suitable for the audiences being addressed, both orally and in writing. — Knowledge of the teaching and learning processes of mathematics.	

Consultation process with stakeholders

Graduates and employers were consulted about generic, and some subject specific competences in a questionnaire as part of Tuning I; academics were consulted also about more detailed subject specific competences. The results informed the subsequent paper «Towards a common framework for Mathematics degrees in Europe», which was also published in the Bulletin of the European Mathematical Society. This paper has also been widely disseminated at national levels.

4. *Workload and ECTS*

While most of the European higher education area is tending towards 180 ECTS credit first cycle degrees, Spain, Portugal and Ireland, for various reasons, not least the age of entry, will most likely have a preponderance of 240 ECTS credit first cycle programmes. The Tuning group expressed the view that if a pedagogical qualification were to be obtained as part of the first cycle, then it should have 240 ECTS credits.

The requirement that a thesis or dissertation form a significant part of the second cycle suggests a range of 90 to 120 credits at this cycle.

Cycle	ECTS Credits
First	180 is the most common, although some programmes use the 240 model for the first cycle.
Second	Most common is 120
Third	Mostly a PhD programme with a duration of three years

5. ***Learning, teaching & assessment***

Learning and teaching of mathematics typically involves a combination of the following:

- **Lectures.** These are seen as a very time-efficient way for students to learn part of the large material involved in the corpus of mathematics. In some cases, students acquire prepared lecture notes or have a set textbook; in other cases the taking of notes is seen as part of the learning process.
- **Exercise sessions**. These are organised most often in tandem with lectures. They occur as groups with supervision, or individually as homework with subsequent supervision of the results. The aim of the exercises is two-fold: understanding of the theoretical material through examples and applications to problems. These sessions are essential in mathematics, where understanding is acquired by practice, not memorisation.
- **Homework.** While demanding on the time of the lecturer and/or teaching assistant, homework is clearly one of the most effective ways in which students can be encouraged to explore the limits of their capabilities. Homework, of course, allows feedback to the students, which gives them a clearer picture of their performance; however, while homework is often assigned, it is less often graded, except where classes are small.
- **Computer laboratories.** These are perhaps the most significant change in the teaching of mathematics in recent years, introducing an experimental aspect to the subject. They feature not only in computer science related and computational courses, but also in statistics, financial mathematics, dynamical systems etc.
- **Projects**. These are done individually or in small groups, and typically involve putting together material from different sub-

fields to solve more complicated problems. Small group projects can help to develop the ability to do teamwork (identified as an important transferable skill). The projects *may* involve significant computational elements, as in the case of the computational competences referred to above. Projects, particularly significant final year projects where they exist, also afford the opportunity to develop students' verbal and written communications skills.
- **Dissertation.** This is considered essential at second cycle, where it should be supplemented with bibliographic searches etc.

Best practice in learning, teaching and assessment for some subject specific competences

Competence: Ability to formulate problems mathematically and in symbolic form so as to facilitate their analysis and solution. This competence essentially involves the ability to express a simple problem in the form of an equation, to express a statement written in common language in symbolic/mathematical form and vice versa, and to be critical about the solution: to know when a solution is sensible. This can be developed through feedback on exercises, and through problem solving and project work, where the application can illustrate the reasonableness of the solution.
Competence: Ability to design experimental and observational studies and analyse data resulting from them. One interpretation of this competence is that first cycle students should be able to design functioning code segments in a high level language, correct input errors (i.e., understand the mathematics of the syntax), and then interpret the data (for example a phase plane portrait). In general, as computer aided analysis becomes more and more common, ability to appropriately design experiments will become a skill of increasing importance. Laboratory sessions are the best environment in which to develop such skills.
Competence: Facility with abstraction including the logical development of formal theories and the relationships between them. This includes the following «abilities»: —understanding what mathematical objects are, —manipulating them under formal rules,

—distinguishing between correct and incorrect operations,
—understanding the role of axioms, definitions and theorems.

Students are introduced to a variety of formal mathematical theories. They explore the limits of the theories under study, and they learn how some aspects of reality can be transformed into a formal theory after excluding what is considered accidental for the particular problem. They study and understand some theorems, perform some manipulations under formal rules and check their work against the correct versions, which are supplied.

6. *Quality enhancement*

The «Tuning list of key questions for programme development and quality enhancement in the framework of the Bologna reform» provides a mechanism for the development of new programmes. It also serves as a reference point for modifications of existing programmes: e.g., redrafting in terms of learning outcomes and ECTS credits.

2.2.8. **Nursing**

1. *Introduction*

Nursing is the first health care regulated group and practical discipline included in the Tuning project. It is an occupation known by the action verb «nursing» rather than by a traditional neutral noun (Agan, 1987). Nursing is a person - based occupation, generally acknowledged to be both an art and science, drawing on knowledge and techniques derived from its own knowledge base, traditions, the established sciences and humanities. Nursing activity varies across Europe in relation to the role of nurses in society, the organisation of the health and welfare systems, the legal authority and accountability afforded to nurses and the national resources of the labour market and economy.

The programmes designed to enable general nurses to practise in the discipline are subject to two European Directives relating to the qualifications of «nurses responsible for general care». These are Sectoral Directive 77/453/EEC of 27 June 1977 and Directive 89/595/EEC of 10 October 1989 summarised in (conselg 1977L0453 dated 31/7/2001). Other specialities in nursing are not subject to these specific, Sectoral

Directives but are covered by the General Systems Directive (89/48/EEC of 21 Dec. 1988). Internationally, many countries have achieved —or are aspiring to attain— first cycle equivalence, frequently referred to as «graduate» status for nursing at registration[9] level. The Sectoral Directive does not specify academic attainment. The location of higher education nursing programmes varies from polytechnics, university colleges, universities or a mixture of the three. Following registration, many countries report limited opportunities for continuing education and specifically post graduate activity. In countries where registration is not accompanied by a higher education qualification, nurses seek academic and/or professional study at first cycle level (e.g. Germany). The development of the profession is such that post graduate/second cycle studies are often undertaken in disciplines other than nursing or through «foreign» countries until the post graduate centres in nursing are established.

Within the professional /academic literature there is an extensive and established corpus of work concerning both the nature of nursing, nursing competence, nursing pedagogy, clinical learning and decision making, and the struggles for professionalisation within a group that is predominantly female in many countries. Nursing is historically often managed from Health rather than Education Ministries until Higher Education qualifications are associated with registration. At this point, there is usually a protocol which determines the nature of the collaboration between the two Ministries. The line 1 paper provides some illustrative European definitions of the nature of nursing to guide the non specialist reader; it also provides an overview of contemporary nursing issues. For the purposes of this template, the nurse discussed in these papers is the one defined in the International Labour Organisation's guide (ILO, 1977) as the first level, professional nurse. This nurse is someone who has the education and training «recognised as necessary for assuming highly complex and responsible functions and authorised to perform them». For the purposes of the Tuning project, it is the professional, first level nurse who is operating at first cycle level.

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[9] For the purposes of this paper, the term «registration» is used to denote the nurse who is deemed to have achieved the national qualification which complies with the General Nursing Directive. In some countries, the term «license to practise» may be used. The student nurse in this context is the one undergoing a course of study to achieve this qualification.

2. ***Degree profiles and occupations***

Typical degrees offered in Nursing / Typical occupations of the graduates in Nursing (map of professions)

<table>
<tr><th>Level (first or second cycle/ under-graduate or graduate studies)</th><th>Sub discipline / Field of specialization</th><th>Cate-gory / Group of profe-ssions</th><th>List of professions related to specialization/ category</th><th>Profile of the programme of studies (short description)</th><th>Most relevant subject-specific competences (for profile)</th><th>Most relevant generic competences (for profile)</th></tr>
<tr><td>1. First cycle / under-graduate level</td><td>Courses leading to EU recognised qualification for the general nurse
Some countries have specialities like pediatric, psychiatry, learning disability etc</td><td colspan="2">Registered nurse according to country tradition in governmental, voluntary and private sectors.
Access to other occupations in health and social care.
Access other person centred occupations (air stewards, service industries)</td><td>Fulfils requirements for EU General Directive
3 years or 4600 hours.
Specified content of theoretical and clinical instruction</td><td>All relevant., but less emphasis on leadership, management and administration of health services and research skills</td><td rowspan="2">Application of knowledge to practice
Ethical committment</td></tr>
<tr><td>2. First cycle / under-graduate level</td><td>Course for «registered» nurses to gain a first cycle degree: All of the above plus.
Specialist clinical nursing subjects- wide variety
Leadership/ management/ administration
Education
Public health</td><td colspan="2">Registered nurse according to country tradition in governmental, voluntary and private sectors.
Access to other occupations in health and social care.
Access to other person centred occupations (air stewards, service industries)</td><td colspan="2">— Leadership, management and administration of health services
— Clinical nursing specialities with or without practice competences
— General nursing studies
— Research methods in health.
— Nurse education</td></tr>
<tr><td>1. Second cycle / graduate level</td><td>Clinical speciality or nursing studies</td><td>Teacher or lecturer of nurses
Nurse specialist.</td><td colspan="3">Focus on clinical knowledge, decision making and/or theory and practice of nursing
Ethics in health care</td><td rowspan="4">Analysis, problem solving
Research or evidence based skills
Self reflection
ethics</td></tr>
<tr><td>2. Second cycle / graduate level</td><td>Leadership/ management or administration focus</td><td>Nurse or health services manager</td><td colspan="3">Focus on leadership and management
Finance and economics</td></tr>
<tr><td>3. Second cycle / graduate level</td><td>Education focus</td><td>Teacher or lecturer of nurses</td><td colspan="2">Clinical and/or theoretical teaching</td><td>Interpersonal skills
Learning theory
Subject knowledge</td></tr>
<tr><td>4. Second cycle / graduate level</td><td>Research methods</td><td>Research career in nursing.
Academic career.</td><td colspan="2">Academic career or based in health services for research or audit.</td><td>Research methods
Ethics and governance</td></tr>
</table>

As the table indicates, the representation of nursing within the Tuning project reflects the various stages of development and socio cultural influences of contemporary European nursing. The country profiles reveal the diversity and in some cases paucity of opportunities for nurse education. Students entering the profession who undertake first cycle degrees do so in the associated Faculty and predominantly study nursing itself. Broadly speaking academic qualifications at first cycle or second cycle for registered nurses fall into five categories representing the typical career routes of nurses:

—Leadership, management and administration of health services.
—Clinical nursing specialities.
—General nursing studies.
—Research methods in health.
—Nurse education.

Some of these courses are also assessed in practice.

In addition, nurses undertake a range of interprofessional/ multi-disciplinary courses for example health education, medicine or social care, studies in rehabilitation, nutrition, public health, counselling. In some countries, specialisation occurs as vocational training rather than university/higher education. In contrast, others are now developing «consultant nurses» at professional and /or doctoral (third cycle level). An eight hundred page report[10] was produced by the European Commission in 2000 analysing Specialist Nurses in Europe (XV/98/09/E). The main obstacles to mobility were identified and particular reference was made to «the direct entry of nurses with a limited sphere of training».

Role of subject area in other degree programmes

Given the statutory nature of the academic and professional programmes associated with nursing, the subject area itself rarely contributes to other degree programmes. This is not to say that there may not be shared learning and teaching with other health /social care disciplines and professions. For example, there may be joint programmes to develop individuals as nurses and social workers. Similarly, nurses may undertake units of their programme with other disciplines, (e.g. pharmacology, ethics, research, sociology or psychology of health), but the «pure» nursing units are rarely undertaken as part of other degree programmes. Interprofessional learning at first cycle pre-registration level

[10] (http://europa.eu.int/comm/internal_market/en/qualifications/nursesintro.htm)

is increasing where competences are held in common with other health/social care students.

3. ***Learning outcomes & competences - level cycle descriptors***

Level descriptors for Nursing

It is acknowledged that the qualifications at first, second or third cycle levels may be in Nursing Practice, Nursing Studies, Nursing Science or Humanities according to local custom. This is usually related to where the nursing department is situated in the higher education institution, for example independently, in medical, humanities or science Faculties. For the purposes of clarity, the use of the term «nursing» alone is reserved here for programmes where there are practice based competences as a requirement of the programme award. This has not been completed as yet for the second and third cycle levels. To distinguish this type of degree from others, the term nursing science will be used interchangeably with the term nursing studies. The use of the word «science» is not meant to convey a commitment to a positivist model for nursing.

It is recognized that in some countries there are two types of doctoral studies in nursing. The first is the traditional empirical/theoretical based doctorate. The second is the «professional or clinical» doctorate. The latter is emerging in nursing as nurses have more academic and professional opportunities to become more specialist and can lead and advance practice managing a user case load.

These following descriptors have been designed cognizant of the Dublin descriptors www.jointquality.org and other national frameworks where they were applicable. *These descriptors should be considered as working ideas subject to further consultation.*

Cycle level descriptors

First cycle level descriptors *Work in progress*
Competency profile for the qualification with registration A Bachelor in Nursing / Nursing Science will have achieved specified competences acquired during a development-based study programme located in an academic environment with research affiliation. The programme will include relevant mandatory theoretical and practical

components agreed in dialogue with stakeholders and competent authorities.

The graduate should possess basic knowledge of, and insight into, the central disciplines and methodologies used in the nursing profession. These attributes should qualify the graduate to carry out vocational functions and to act independently within the area targeted by the study programme. The graduate should be equipped to undertake further work/practice based learning and, where appropriate, for further study in a relevant professional area, second or third cycle programme.

Competency goals

A Bachelor in Nursing / Nursing science is able to:

Intellectual competences:

—describe, formulate and communicate profession —related issues and options for taking action;
—analyse profession-oriented issues theoretically and consider them in practice;
—structure own learning.

Professional and academic competences:

—apply and evaluate different methodologies relevant to nursing;
—demonstrate insight into central theories, methodologies and concepts within the nursing profession;
—document, analyse and evaluate the various types of nursing practice;
—utilize research and development to develop evidence-based nursing and nursing activities.

Practical competences:

—demonstrate proficiency in the practical nursing competences/skills required for the registration or licence (see list of first cycle competences);
—make and justify decisions based on his or her own nursing experience;
—show personal integrity and act within the framework of nursing ethics;
—demonstrate ability and willingness to function in a multidisciplinary setting;
—participate and conduct development work / projects relevant to the nursing profession.

Formal aspects

Admittance requirements:

University requirements or equivalent (includes aptitude for person based discipline and ethical commitment).

Length:

180-240 ECTS credits (we recommend that future programmes should include a minimum of 90 credits designated for the practical competence and that the programme length should be at least 210-240[11]).

Further education options:

Second cycle /Master programmes.
Professional theoretical and practical programmes.
Development as leader/manager, clinical specialist, educator or researcher.

Second cycle level descriptors
Work in progress

Competency profile for the qualification without practical

A Master in Nursing Science/Studies will have achieved competences that have been acquired via a course of nursing studies situated in a research environment context. The graduate is qualified for employment in the labour market on the basis of his or her academic discipline (nursing science), professional competence (nursing) as well as for further research (doctoral studies).

When compared to a first cycle graduate in nursing / nursing science, the second cycle graduate will have developed his or her academic knowledge and independence so as to be able to apply scientific theory and method on an independent basis within both an academic and professional context.

Where the candidate is studying for a second cycle degree in clinical nursing/with practice competences then the person will be able to perform advanced and/or specialist nursing.

Competency goals

In addition to the competences described for the first cycle/Bachelor's degree, a second cycle/Masters in Nursing / Nursing Science graduate is able to:

Intellectual competences:

—Communicate complex professional and academic issues in nursing and nursing science to both specialists and lay people in an clear and unambiguous manner.

[11] We consider that nursing constitutes a special case (see ECTS Users' Guide).

—Formulate and analyse complex scholarly issues in nursing and nursing science independently, systematically and critically.
—Continue own competency development and specialisation in a manner that may be largely self-directed or autonomous.

Professional and academic:

—Evaluate the appropriateness of various methods of analysis and complex issues in nursing and nursing science from an academic and advanced professional nursing perspective.
—Demonstrate:

- specialist understanding in extension of the Bachelor degree,
- a broader academic perspective for his or her Bachelor degree,
- new academic competences in addition to his or her Bachelor degree.

—Demonstrate comprehensive understanding of research work in nursing science and therefore be capable of being active in a research context.
—Demonstrate practical insight into the implications of research in a practice based profession (research ethics and governance).

Practical competences:

—Make and justify decisions reflecting on social and ethical responsibilities as well nursing and nursing science issues and if necessary carry out analysis that results in an adequate basis for decision-making.
—Comprehend development work based on scholarly, theoretical and / or experimental methods in nursing and nursing science.

The specific subject clinical/practical for the Master in Nursing (Practice) are to be developed. They currently vary from one country to another and reflect institutional options. Comments are particularly welcomed.

Formal aspects

Admittance requirements:

Selected first cycle degree programmes with a satisfactory performance or professional equivalent (for professional practice programmes this includes aptitude for person based discipline and ethical commitment).

Length:

90 or 120 ECTS (we recommend that future programmes that focus on advanced/specialist practice should assign designated credits for the practical competence and that the programme length in this case should be at least 120 ECTS).

Further education options:

Doctoral programmes or specialist nursing.

See Background papers 1 and 2.

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Third cycle level descriptors
Work in progress

It is recognised that in some countries there are two types of doctoral studies in nursing. The first is the traditional empirical/theoretical based doctorate. The second is the «professional or clinical» doctorate. The latter is emerging in nursing as nurses have more academic and professional opportunities to become more specialist and can lead and advance practice managing a user case load.

Competency profile

A doctoral studies graduate in nursing science will have achieved competences that have been acquired through a course of nursing studies that has been based on empirical work that included original research conducted on an independent basis. Within an international context, the graduate is able to conduct research, development and teaching tasks at academic, health care settings and other organizations where a broad and detailed knowledge of research in nursing science is required. Their research will have been based on an appropriate research method in, or applied to, nursing and thus yields a research effort that equals the international standard for doctoral studies.

A clinically focussed doctorate graduate will have conducted empirical work that is work/practice focussed and will have gained increased in work based functions. *In Tuning 3, further work will be conducted on these competences and the profile associated with this doctorate.*

Competency goals

In addition to the competences described for the second cycle, a third cycle nursing graduate is able to:

Intellectual competences:

- Communicate, and defend, a substantive, contemporary and detailed knowledge of a specific area of nursing both orally and in writing.
- Formulate and structure a long-duration, continuous research project on an independent basis.

A «professional» doctorate graduate would be able to:

- Communicate, and defend, a substantive, contemporary and detailed knowledge of a specific area of nursing practice both orally and in writing to with peers, the larger scholarly community and with society in general.
- Lead, formulate and structure a long-duration, continuous work based project.

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—Achieve designated advanced related to their work based function.

Professional and academic:

- —Conduct nursing research on an international level and in an international context.
- —Initiate, formulate, structure, lead and evaluate the appropriateness of nursing science methods for research projects on an independent basis.
- —Demonstrate specialist nursing science understanding of cutting-edge theories and methods in nursing at an international level.
- —Display responsibility in relation to own research (research ethics).

A «professional» doctorate graduate is able to:

- —Conduct nursing projects in their field fully aware of the international application and relevance of the project.
- —Evaluate the appropriateness of nursing science methods for clinically based projects on an independent basis.
- —Demonstrate and promote specialist nursing knowledge and practice derived from cutting-edge theories and methods in nursing. This knowledge should be adapted for the social and cultural context of practice.
- —Display ethical responsibility in relation to own research /work based practice (research and practical ethics).

Practical competences:

- —Plan and maintain academic and professional responsibility for complex tasks based on scientific nursing theories and / or skills and methods of research.
- —Make decisions supported by complex documentation/*clinical evidence.*
- —Critically analyse, evaluate and synthesise new and complex information that is relevant for professional/clinical practice, society and policy development.
- —Develop innovative approaches to nursing practice that are patient/client centred.

In addition those undertaking professional doctorates would have enhanced related to their work based function.

The specific subject clinical/practical for the «Professional Doctorate» in Nursing Practice are to be developed. Comments are welcomed.

Formal aspects

Admittance requirements:

Selected second cycle degree programmes with satisfactory performance or professional equivalence. (For professional doctorate and practical competences, this includes aptitude for person based discipline and ethical commitment).

Length:

180 ECTS-240* ECTS to include professional competences where this is an option. In some countries the length of the programme has not been specified in terms of credits.

Further education options:

No degree-conferring further education options.
Membership of learned societies and professional associations.

See Background papers 1 and 2.

Learning outcome summary

GENERIC

The most distinguishing, but not surprising, feature of the generic academic is the marked first preference for the capacity to apply knowledge to practice as being the most important competence. The remaining competences were clustered in six groups with interchangeable ranking within the group. The second group comprised ethical commitment and the skills of analysis, synthesis, problem solving and interpersonal skills. The third group predominantly comprised skills relating to the capacities to learn, reflect, adapt and make decisions in an interdisciplinary context. The least important competence was knowledge of a second language, while skills associated with leadership, management; research and enterprise were found in the fifth and sixth groups. Not withstanding these differences, the lowest score ranking was 2.9 for three competences, while all the rest were over 3, that is to stay the majority of the competences were rated as being at least «considerably» important.

With respect to the second cycle, each competence gained in importance from the first cycle. The most marked differences were in the fifth and sixth groupings, namely leadership, management, research where they have an increased importance at second cycle. Once again, these are not surprising findings and reflect the natural career progression of a registered nurse.

SPECIFIC

First cycle:

It is important to note that the mean scores for the importance of each of these is at least 2.6 (minimum range at 2.3), with 33 being ranked 3 or over. This indicates consensus and agreement concerning the developed and outlined in paper 1. Those rated below 3 were once again those associated with policy, leadership, evaluation, fiscal matters, research, supervision and the assessment of risk. These are all competences that one would **not** expect a student to be experiencing with any degree of autonomy. Indeed, ethically and professionally it would not be appropriate for them to do so. Following feedback received after the survey, an additional competence has been added to address the specific research skills required for the modern nurse. The Spanish case study is consistent with these findings.

Second cycle:

The mean responses were all within the range of 3.5 or above indicating that each competence was considered very important for professional practice and its study. While the highest ranking competence at 3.9 demonstrated the importance of self reflection, accountability and continuous learning (no 6), the top 8 scores were associated with the professional role of the nurse, leadership and management and problem solving. Differences between first and second cycle reflect the career progression of nurses.

Differences between first and second cycle rankings reflect the nature of professional practice and its study. In some areas an acquired competence would be expected to be sustained (e.g. health and safety, medications), in others its importance would gain significance (leadership, management, research, communication) and in others the development would be incremental (nursing practice, decision making, knowledge).

Given the tendency for agreement within these results, there would appear to be a degree of consensus as to the appropriate competences at first and second level for a degree associated with registration and its subsequent development. Country differences did not appear significant, tending to reflect cultural differences and the developmental stage of nursing within that country (for example knowledge of a second language and the ordering of research skills). Further work is now required to refine these competences as a consequence of stakeholder consultation.

Consultation with stakeholders

Associated with the original EU Directive, An Advisory Committee on Training in Nursing was initiated although it has since been stood down (see 77/454/EEC). The Standing Committee on Nursing (www.pcnweb.org) meets as a mutual space and has position statements on Bologna, it has recently changed its name to The European Federation of Nurses Associations. When the Tuning project was launched, there were few common platforms to address the Directives and stakeholder involvement. This is an ambitious but necessary undertaking if the Tuning work is to have practical outcomes. Pan European Activity has been emerging recently, for example in April 2004, the Chief Nursing Officers convened under the Irish Presidency and there is an emergent network of European Nurse Regulators (www.fepi.org).

Stakeholder engagement is the subject of ongoing work and will continue in Phase 3. The Tuning members have been appropriately consulting within their own countries according to the national cultural and political traditions and are now communicating with non Tuning groups. Possible stakeholders to be engaged include:

- —Other Higher Education institutions in countries not represented by the Tuning membership.
- —Chief Nursing Officers —or their equivalent— of the Member states, and through them the relevant Health Ministries and employers.
- —The competent authorities.
- —The professional associations and trade unions significantly representing nurses.
- —Student associations.
- —Service users where possible.

There is ongoing collaborative dialogue with the thematic network for nursing who are working in synergy with us.

4. *Workload and ECTS*

As the Line 2 paper discusses, the EU Directives although subject to national interpretation by the relevant «competent authority», comprise a list of syllabus content and prescribed hours for clinical and theoretical instruction. This prescription is that the registration programme must be of at least 3 years or 4600 hours. ECTS, combined with the Tuning methodology, would be a good vehicle through which some of the historical anomalies may be addressed. This will facilitate a competence based framework with greater flexibility in an interprofessional and trans-professional health and social care environment. The knowledge and skills required by 21st Century nurses is more extensive in an era of gene therapy, technology, complex health and social care needs, rising consumer expectations and increased mobility of populations. The practical nature and employment demands of the discipline require distinct and different level descriptors for practice.

The Directives contributed to a minimum standard of programme content and length with a wide diversity in nursing courses both academically and professionally across the European Area. For example, the minimum academic level specified by the competent authority reveals first cycle programmes with registration (Ireland, Spain, Wales, Scotland); a programme equivalent to two thirds of a first cycle programme (England), and fifty per cent (Malta); countries in transition from minimal higher education association to first cycle (Slovak Republic) and situations where nurses acquire their professional training at secondary school level with no higher education qualifications with registration (Germany[12]). In some countries, academic nursing is embryonic and often under the control of medical or humanities Faculties. Box 1 (p. 342) gives a case study example from Finland that demonstrates a mixed model of nurse education. A contrasting example comes from the UK where, to respond to an increasing graduate workforce, a two year programme at post graduate level with registration has emerged for individuals with a related first cycle degree.

Cycle	**Suggested ECTS range** *Nursing programmes with registration or practice competences*	**Suggested ECTS range** *Nursing Programme that excludes assessment of practice competences*
First cycle	180 minimum 210-240 suggested	180
Second cycle	90 minimum 120 suggested	90
Third cycle —«Professional» doctorate —Traditional doctorate	180 minimum 210-240 suggested	180 minimum

5. ***Learning, teaching and assessment***

The notion of *differentiation* is crucial to nursing to enable development, progression and achievement of safe, intelligent

[12] The first registration with first cycle programme commenced at the Evangelische Fachhochschule, Berlin 4/10/2004.

practice in the world of patients and their families/loved ones. This is why we argue for a sub first cycle level descriptor. Many typologies of learning do not accord value to the role of apprenticeship, craft knowledge and skill acquisition that are often fundamental to learning in a person - based practice. Through our analysis of nursing in our representative 13 countries, we considered that while there is a place for a variety of learning and teaching models in nurse education, these are used in different proportions according to the resources available and the developmental stage of the learner. Traditional models still have an important place in teaching/learning nursing for novices, or at the early stage of a more complex competence acquisition. These methods are relevant to the development of safe practice, for example learning lifting and handling of patients and the ability to carry out procedures safely. Craft knowledge is often passed on from person to person, and it is appropriate to do so in workplaces where role modeling and coaching develop practises ahead of the evidence base. This applies to both novices and experts.

When human and material resources become available, there is an increase in small group work and technology assisted teaching/learning. This includes the use of reflective and critical approaches to learning together with the use of informatics that support web based and work place learning. Practical skills are often developed through observation of practice, demonstrations, simulations, role play and exposure and engagement in clinical experiences. However, many countries reported the challenges encountered during clinical placements with student supervision and the quality of patient care. When available, resources are now being allocated to support learners in practice, to prepare students for practice through clinically based wards, clinical skills laboratories and through the use of simulations or virtual practice.

The way that curricula are developed is not only cultural, but in nursing reflects the stage of nursing within that country and where it is situated and controlled. Historically, there is tendency for nursing to initially reflect a biomedical model before emerging its own models and theories of practice, as the model changes so do the pedagogies and assessment strategies. Curriculum expression reflects also the curriculum design, resources available and teacher/student capabilities. Assessment strategies in nursing at first cycle with registration need to address both theoretical and practical based. Diverse strategies are used to reflect the assessment of knowledge, skills, attributes and professional values. In the interests of public safety, each programme will identify core components that must be passed in order to achieve the necessary licence/registration to practice.

Best practice

An example of learning, teaching and assessing strategies to achieve a nursing competence relevant to the subject area

Competence to be achieved at the end of the course. **What does this competence mean for students?**	**Potential learning outcomes (LO) found in units/modules during the course to achieve the competence. Placed in order of increasing complexity. (Ability to...)**	**Possible learning and teaching strategies/ methods/ pedagogies.** **How are students helped to acquire this competence?**	**How do you assess whether, or to what degree they have achieved this competence (progression)? How do students know whether, or to what degree they have achieved this competence and if not why they have not achieved it?**
Ability to practice within the context of professional, ethical, regulatory and legal codes, recognizing and responding to moral/ ethical dilemmas and issues in day to day practice. Awareness of the different roles, responsibilities and functions of a nurse. The student can fully realize what it means to be a registered nurse, the duties, responsibilities and practises that are associated with this role within the health care team and society.	Demonstrate an understanding of nursing as a subject/ science and as a profession Explain and demonstrate the legal and ethical responsibilities of a registered nurse and other health care workers Apply knowledge of the relevant Acts to the patients' legal rights. Apply knowledge of the relevant Acts and policies to the patient as a citizen and their rights and duties in financial and social matters. Explain and practice according to the legal and ethical codex for nurses. Updates knowledge in this field. Awareness of the intentions in general legislation as it applies to the nursing context.	Lectures to introduce the topic. Guided reading of ethical concepts and application, codes of practice. Videos and analyse of critical incidents. Discussions and debates focused in practice examples: professional/ ethical dilemmas in practice. Role plays and simulation exercises. Group work. Presenting in plenary sessions. Supervised practical experience in different health and social care settings. Increasing responsibility in practice.	This competence would be assessed throughout the course both theoretically and practically. It is common to have specific assessment criteria related to this competence. Persistent failure to achieve this competence is usually serious. This competence would be assessed directly and also indirectly through inferences made in others. It covers several generic competences for example ethical commitment. Feedback from academic assessments would guide the student towards their theoretical understanding and application to practise. The style of theoretical assessments would be scrutinised for evidence of understanding and applying these. Feedback from practical assessments would indicate level of achievement (often through portfolios, structured assessments and clinical reports from practising nurses).

6. ***Quality enhancement***

Quality enhancement in nursing addresses theoretical and clinical, practical or work based learning whose purpose is to enable the student to meet the aims, outcomes and of the curriculum.

There is significant evidence to confirm that quality in the clinical learning environment is related to how students are treated (humanistic or not), team spirit, leadership and management style of the senior clinician and available support for teaching and learning. Audits of clinical learning environments may be undertaken by the educational provider, regulatory bodies or quality assurance agencies. In these situations it is typical for the following items to be considered:

- Number, experience, qualifications and mix of clinical staff.
- Motivation of staff.
- Research or evidence base of clinical practice.
- Patient/staff ratios.
- Relationship between educationalists and clinicians.
- Philosophy of nursing care.
- Learning opportunities and supervision.
- Development of staff.
- Quality of patient care.

These elements augment the previously identified issues within the Tuning methodology for quality enhancement and can be applied to other similar work based learning programmes. They also indicate the dilemma faced by Higher Education Institutions who may have limited control over the clinical environment where their students are placed. The involvement of stakeholders in quality enhancement is therefore crucial. This is achieved through partnership and finance arrangements, staff development, audit, action plans, and feedback from students, external agencies and academic staff.

2.2.9. **Physics**

1. ***Introduction to the subject area***

The body of knowledge, which is broadly named *physical sciences*, generates several degree-courses in the European Universities. Names such as Physics, Astronomy, Theoretical Physics, Applied Physics, Engineering Physics, Biophysics, Physical Oceanography, Geophysics, Materials Sciences, Environmental Physics, etc. can easily be found.

The *pure* degree-course is the ***Physics degree-course*.** In some of the above degree-courses, other subjects may be quite relevant together with physics, e.g. chemistry in Materials Sciences. All the above degrees always and heavily rely on a good mathematical background, which is offered, often since scratch, within the degree course itself. Continental universities traditionally offered to the Physics students a very deep and thorough approach to mathematics teaching/learning.

Two main approaches exist, when designing a Physics programme:

- —The initial years of the programme are common to the subjects of physics, mathematics, chemistry, etc. and the students make the choice of the main subject only later (e.g. at the third year, this is the case of Copenhagen).
- —The whole degree-course is focused on «physics» from the beginning.

Physics, being the *most basic* after Mathematics among the Natural Sciences, is usually offered within the Faculty of Natural Sciences; this is the case of many continental universities. Another quite usual setting is the offer of the degree-course within a Physics Department, where the physicists' community lives. In other cases the offer of a degree-course in Applied Physics or similar occurs within a Faculty of Engineering or a Department of Applied Physics. The physicists' community often offers *units in Physics* for a number of quite different Degree-courses of the same university (see below).

The Tuning network in Physics reflects this complexity of scenarios. Nevertheless experience showed that meaningful common reference points can be obtained even with this apparently not homogeneous sample of institutions.

2. *Degree profiles and occupations*

For a list of possible degrees, do see the introduction above. We give here the profile and occupations for the Physics Degree.

Typical degrees offered in Physics

Cycle	Typical degrees offered
First	The degree programme tends to includes the following: — knowledge of mathematics and related subjects (basic mathematics; mathematical methods for physics; computing; numerical analysis); — knowledge of basic physics [introduction to physics; classical physics (including demonstrations); quantum physics (including demonstrations); laboratory]; — knowledge of basic elements in theoretical physics (analytical mechanics; classical electromagnetism, relativity, etc.; quantum mechanics / theory; statistical physics); — knowledge of elements of applied physics and related subjects (chemistry; electronics & related; etc.); — knowledge of basic elements in modern physics (atomic, nuclear and sub-nuclear, solid state, astrophysics); — small intermediate or final physics project(s), depending on the institution; — other essential elements, in varying amount depending on the institution (e.g. Knowledge of topics «chosen from list(s)»; presenting a lab report; taking active part in a seminar); — some knowledge/abilities in non-standard subjects, in varying amount depending on the institution (e.g. vocational training, skills development, placement, etc.); — knowledge of topics identified through a «completely free choice» of the student.
Second	The degree programme tends to include the following: — advanced knowledge of theoretical physics (analytical mechanics; classical electromagnetism, relativity, etc.; quantum mechanics / theory; statistical physics); — deep knowledge of mathematics and related subjects mathematical methods for physics; computing; numerical analysis); — knowledge of specialised core(s) of modern physics (atomic, nuclear and sub-nuclear, solid state, astro-physics); — knowledge of other specialised subjects (biophysics, medical physics, meteorology, environment physics, oceanography) depending of the institution and profile of specialization; — ability to solve problems in comprehensive physics (depending on the institution); — final year physics project / thesis and development of the corresponding research skills; — other essential elements, in varying amount depending on the institution (e.g. Knowledge of topics «chosen from list(s)»; ability to master advanced laboratory practice; presenting a lab report; taking active part in a seminar); — some knowledge/abilities in non-standard subjects, in varying amount depending on the institution (e.g. vocational training, skills development, placement, etc.); — knowledge of topics identified through a «completely free choice» of the student.

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Cycle	*Typical degrees offered*
Third	A third cycle degree involves: — coursework (depending on the institution, but in any case limited in time); — original research work, usually carried out in a research group. The supervised doctoral research mostly leads to a written dissertation, to be assessed by an appropriate Examination Board, and/or to publications in refereed journals.

Typical occupations of the graduates in Physics (map of professions)

FIRST CYCLE IN PHYSICS

At present (may 2005) there is very limited experience in job access after the first cycle degree in physics, since this is a new degree in most European countries.

Cycle	**Occupation**	
Sub discipline / Field of specialization	Category / Group of professions	List of professions related to specialization
First	Technical jobs in governmental organizations or private sector (banking, insurance companies, services) at intermediate decision levels	—Placements and positions in industrial companies —Technical assistants —Informatics, computer science, information technology —Jobs in Insurance companies and banking (software, development, planning assistants) —Self employment —Meteorologist* —Metrologists

* The access qualifications for the different classes of meteorologists are normally regulated at national level.

SECOND CYCLE IN PHYSICS (AND INTEGRATED[13] DEGREES)

Since the second cycle allows diversity in the specialisation fields of the final graduates, we list several sub-characterisation of the second

[13] *i.e.* a long one-tier first degree, without intermediate exit, replacing the two-tier degree scheme of Bachelor's plus Master's degrees.

cycle degree in Physics. In each sub-area the most relevant specific competences (not listed here, but see a general description in section 3 below) may have different relevance or weight.

Cycle	Occupation	
Sub discipline / Field of specialisation	Category / Group of professions	List of professions related to specialisation
Second Physics / Experimental Physics	—Physicists in governmental organizations or private sector —Research, innovation and development related professions —High Technology sector —Engineering —Metrology /quality control related professions —Technical consultancy —Banking	—Physicist (in universities, research institutes) —Research assistants in universities, institutes, industries. —Industrial physicist (in companies dealing with microelectronics, software, tele-communications, opto-electronics, optics, materials) —Self employment —Technical consultants —Metrologists —Quality controllers —Technical jobs in radiation protection services
Physics/ Theoretical Physics	—Physicists in governmental organisations or private sector —Research, innovation and development related professions —Banking and Insurance sector	—Physicists (in universities, research institutes) —Research assistants in universities, institutes, industries. —Industrial physicists: microelectronics, software development, telecommunications, optics, information technologies, etc —Computer science related professions (software development, economical and finance analysis and modelling) —Self employment —Technical consultants

Cycle	*Occupation*	
Sub discipline / Field of specialisation	*Category / Group of professions*	*List of professions related to specialisation*
Applied Physics/ Technical Physics/ Engineering Physics/ Informatics Physics	—Physicists in governmental organizations or private sector —Research and development related professions in governmental organizations or private sector —Engineering —Metrology / quality control related professions —High Technology sector	—Industrial physicist: microelectronics, software, telecommunications, opto-electronics, optics, materials —Physicist (in universities, research institutes) —Engineers —Research assistants in universities, Institutes, industries. —Computer science related professions Metrologists —Quality engineers —Positions in information technology sector in industry, banks, insurance companies (software development, economical and finance analysis and modelling) —Medical physicist (radiotherapy, radiology and radiation protection)* —Technical jobs in radiation protection services —Technical consultant —Self employment
Biophysics	—Governmental organizations or private sector	—Research assistant in universities, institutes, industry —Positions in insurance companies —Biophysicists —Technical consultant —Self-employment

Cycle	***Occupation***	
Sub discipline / Field of specialisation	*Category / Group of professions*	*List of professions related to specialisation*
Medical Physics*	—Positions in Medical physics: hospitals, governmental institutions for medical care and health security	—Medical Physicist (radiotherapy, radiology and radiation protection)* —Research assistant in universities, institutes, industry —Positions in insurance companies, self-employed businesses —Technical consultant
Physics and didactics or Physics and a second subject, at same academic level, plus didactics	— Teaching**	—Physics teachers at Secondary and High Schools —Teachers in private organizations
Physics/ Meteorology and Physics of the earth and the environment / Oceanography	—Physicists in governmental organizations or private sector	—Research assistants in universities, institutes, public and/or private agencies, industries. —Meteorologists*** —Geophysicists —Oceanographers —Technical consultants —Self employment

* Medical Physicist is a regulated profession in most European countries.

** The route to qualifications, which enable to teach, varies substantially across Europe. In some countries teaching qualifications in Physics are obtained independently of the University physics degree. In some others Physics Teaching is a specialization of a physics degree or even a completely independent degree. So the situation described in the table is not universal.

*** The access qualifications for the different classes of meteorologists are usually regulated at national level.

Role of subject area in other degree programmes

In many universities, the physicists' community offers units in Physics for a number of degree-courses, which are quite different from Physics. Indeed, Physics units are needed as an essential element for the degree-courses in mathematics, chemistry, geology, biology, etc.(all of them within the area of Natural Sciences), for all the degree-courses of the Engineering area and for several of the degree-courses of the faculties of Medicine, Veterinary Medicine, Agricultural Sciences, Pharmacology, History and Philosophy, etc.). Within this context different organisational models are at work. Possible —non exhaustive— examples are:

- the Physics Department serves all the many different interested degree-courses of the given university;
- the academics, who are physics teachers in other subject areas, belong to Departments, which are different from the Physics Department and are closely related to the subject of the degree course.

As an example, European wide meetings of the physics teachers for the Engineering area are convened regularly.

3. *Learning outcomes & competences - level cycle descriptors*

The Physics relevant learning outcomes are given under Degree profile (see appropriate section above). Here below we focus on competences and levels.

Generic competences

The generic competences' importance has been ranked by the Physics academics independently of the cycle, on the basis of the questionnaire, yielding the following order:

Ranking	GENERIC COMPETENCES
1	Basic Knowledge of the field
2	Capacity for Analysis and synthesis
3	Capacity to learn
3	Creativity
5	Applying knowledge in practice

Ranking	*GENERIC COMPETENCES*
6	Adaptability
6	Critical and self critical abilities
8	Basic knowledge of the profession
8	Research skills
10	Interdisciplinarity
11	Oral and written communication
12	Ethical commitment
12	Interpersonal skills
14	Knowledge of a second language
15	Elementary computing
15	Decision making
17	Diversity and multi-culture

Subject specific competences

The importance of the subject specific competences was rated separately for the first and the second cycle by the Physics academics (on a scale from 1 to 4), on the basis of the questionnaire. The actual rating orders are given below.

Our competences and their relative importance in the two cycles describe what is to be in general achieved by Physics students after graduation. Our competences link very well with the Dublin Descriptors, i.e. the more general cycle descriptors recently adopted as one of the founding elements of the European Qualification Framework. Indeed, each of our listed subject specific competences can easily be assigned to one of the five dimensions or elements, which characterise the Dublin Descriptors. This is shown in the tables below, fourth column, where the appropriate Dublin Descriptor dimension is identified for each Physics subject specific competence, according to the following label assignments to the five dimensions.

A Knowledge and understanding.
B Applying knowledge and understanding.
C Making judgements.
D Communications skills.
E Learning skills.

As to further remarks about the link between our competences and the Dublin Descriptors, see Annex I.

First cycle

RATING OF IMPORTANCE ORDER	**SHORT NAME**[14] OF THE SUBJECT SPECIFIC COMPETENCE	**EXTENDED DESCRIPTION OF THE COMPETENCE** on completion of a first cycle degree in Physics, the student should:	DUBLIN DESCRIPTOR LABEL
1	Problem solving skills	be able to evaluate clearly the orders of magnitude in situations which are physically different, but show analogies, thus allowing the use of known solutions in new problems	B
2	Theoretical understanding	have a good understanding of the most important physical theories (logical and mathematical structure, experimental support, described physical phenomena)	A
3	Mathematical skills	be able to understand and master the use of the most commonly used mathematical and numerical methods	A-B
4	Deep knowledge	have a deep knowledge of the foundations of modern physics, say quantum theory, etc .	A
5	Experimental skills	have become familiar with most important experimental methods and be able to perform experiments independently, as well as to describe, analyse and critically evaluate experimental data	B
6	Modelling & Problem solving skills	be able to identify the essentials of a process / situation and to set up a working model of the same; be able to perform the required approximations; i.e. critical thinking to construct physical models	B
7	Prob. solving and computer skills	be able to perform calculations independently, even when a small PC or a large computer is needed, including the development of software programmes	B
8	Physics culture	be familiar with the most important areas of physics and with those approaches, which span many areas in physics	A

14 See previous footnote.

RATING OF IMPORTANCE ORDER	***SHORT NAME*** *OF THE SUBJECT SPECIFIC COMPETENCE*	***EXTENDED DESCRIPTION OF THE COMPETENCE*** *on completion of a first cycle degree in Physics, the student should:*	***DUBLIN DESCRIPTOR LABEL***
10	Literature search	be able to search for and use physical and other technical literature, as well as any other sources of information relevant to research work and technical project development. Good knowledge of technical English is required.	E
11	Learning ability	be able to enter new fields through independent study	E
12	Modelling	be able to adapt available models to new experimental data	B
13	Human / professional skills	be able to develop a personal sense of responsibility, given the free choice of elective/optional courses; be able to gain professional flexibility through the wide spectrum of scientific techniques offered in the curriculum	A-B
14	Absolute standards	have become familiar with «*the work of genius*», i.e. with the variety and delight of physical discoveries and theories, thus developing an awareness of the highest standards	A-C
15	Ethical awareness (relevant to physics)	be able to understand the socially related problems that confront the profession and to comprehend the ethical characteristics of research and of the professional activity in physics and its responsibility to protect public health and the environment	C
16	Foreign Language skills (relevant to physics)	Have improved command of foreign languages through participation in courses taught in foreign language: i.e. study abroad via exchange programmes, and recognition of credits at foreign universities or research centres	D
17	Specific Communication Skills	be able to work in an interdisciplinary team; be able to present one's own research or literature search results to professional as well as to lay audiences	D

SECOND CYCLE

RATING OF IMPORTANCE ORDER	**SHORT NAME**[15] OF THE SUBJECT SPECIFIC COMPETENCE	**EXTENDED DESCRIPTION OF THE COMPETENCE** on completion of a first cycle degree in Physics, the student should:	DUBLIN DESCRIPTOR LABEL
1	Modelling & Problem solving skills	be able to identify the essentials of a process / situation and to set up a working model of the same; be able to perform the required approximations; i.e. critical thinking to construct physical models	B
2	Problem solving skills	be able to evaluate clearly the orders of magnitude in situations which are physically different, but show analogies, thus allowing the use of known solutions in new problems	B
3	Literature search	be able to search for and use physical and other technical literature, as well as any other sources of information relevant to research work and technical project development. Good knowledge of technical English is required.	E
4	Learning ability	be able to enter new fields through independent study	E
5	Modelling	Be able to adapt available models to new experimental data	B
6	Theoretical understanding	have a good understanding of the most important physical theories (logical and mathematical structure, experimental support, described physical phenomena)	A
7	Basic & Applied Research	Acquire an understanding of the nature and ways of physics research and of how physics research is applicable to many fields other than physics, e.g. engineering; be able to design experimental and/or theoretical procedures for: (i) solving current problems in academic or industrial research; (ii) improving the existing results	A-B-C

15 See footnote n. 13.

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RATING OF IMPORTANCE ORDER	***SHORT NAME*** *OF THE SUBJECT SPECIFIC COMPETENCE*	***EXTENDED DESCRIPTION OF THE COMPETENCE*** *on completion of a first cycle degree in Physics, the student should:*	***DUBLIN DESCRIPTOR LABEL***
8	Deep knowledge	have a deep knowledge of the foundations of modern physics, say quantum theory, etc .	A
9	Mathematical skills	be able to understand and master the use of the most commonly used mathematical and numerical methods	A-B
10	Frontier research	Have a good knowledge of the state of the art in - at least - one of the presently active physics specialities	A
11	Problem solving and computer skills	be able to perform calculations independently, even when a small PC or a large computer is needed, including the development of software programmes	B
12	Experimental skill	have become familiar with most important experimental methods and be able to perform experiments independently, as well as to describe, analyse and critically evaluate experimental data	B
13	Specific Communication Skills	be able to work in an interdisciplinary team; be able to present one's own research or literature search results to professional as well as to lay audiences	D
14	Managing skills	be able to work with a high degree of autonomy, even accepting responsibilities in project planning and in the managing of structures	C
15	Human / professional skills	be able to develop a personal sense of responsibility, given the free choice of elective/optional courses; be able to gain professional flexibility through the wide spectrum of scientific techniques offered in the curriculum	A-B-C
16	Physics culture	Be familiar with the most important areas of physics and with those approaches, which span many areas in physics	A

RATING OF IMPORTANCE ORDER	***SHORT NAME*** *OF THE SUBJECT SPECIFIC COMPETENCE*	***EXTENDED DESCRIPTION OF THE COMPETENCE*** *on completion of a first cycle degree in Physics, the student should:*	***DUBLIN DESCRIPTOR LABEL***
17	Updating skills	Enjoy facility to remain informed of new developments and methods and be able to provide professional advice on their possible range of applications	E
18	Foreign Language skills (relevant to physics)	Have improved command of foreign languages through participation in courses taught in foreign language: i.e. study abroad via exchange programmes, and recognition of credits at foreign universities or research centres	D
19	Ethical awareness (relevant to physics)	be able to understand the socially related problems that confront the profession and to comprehend the ethical characteristics of research and of the professional activity in physics and its responsibility to protect public health and the environment	C
20	Absolute standards	have become familiar with "the work of genius", i.e. with the variety and delight of physical discoveries and theories, thus developing an awareness of the highest standards	A-B

THIRD CYCLE (SUBJECT SPECIFIC AND GENERIC)

To be defined.

Remarks about levels (or degree of competences development):

Many subject specific competences appear both in the 1^{st} and 2^{nd} cycle. However, their importance (i.e. rating order) is different. Each cycle is characterised by its own priorities. Indeed, most of the 7 best competences of the 1^{st} cycle (i.e. except «*Problem Solving*» and «*Modelling and Problem Solving*») fall beyond the 8^{th} position in the

2nd cycle ordering. In other words the skills which are most important in the first degree become somewhat less important in the 2nd cycle, probably because they are supposed to be satisfactorily developed already in the first cycle.

For a given competence, the actual *average* rating value in the 1st cycle is always lower than in the 2nd cycle. Such lower values witness the fact that the competence development is a cumulative process. The rating *gap* across the two cycles can be taken as a «rough» measure of the further development, which has to be achieved in the 2nd cycle. Among the «Physics competences» the highest gaps are scored (in decreasing order) by[16] *Frontier research*, *Managing skills*, *Specific Communication Skills*, *Modelling*, *Updating skills*, *Learning ability*, *Literature search*. The lowest gaps are scored by *Absolute standards*, *Theoretical understanding*, *Physics culture*, *Mathematical skills*, *Problem solving* (minimum gap). The highest gaps identify competences, which are appropriate at 2nd cycle level, and small gaps identify competences, which should be already well developed in the 1st cycle.

Finally, our analysis shows that identification of a *common* core knowledge is certainly possible in Europe in the 1st cycle degree courses in Physics, but it becomes rather questionable in the 2nd cycle, essentially because each institution focus on a different specialisation. The common core knowledge of the 1st cycle is quite similar everywhere and shows a time-progression pattern, which is governed by the requirements needed to progress in the subject knowledge. Some variation occurs between the two main existing methodological approaches (i.e. synthetic and analytical approach).

In this general context, certain Physics sub-areas are visited and revisited again during the degree course(s), with the aim of achieving higher and higher levels of understanding.

Consultation process with stakeholders

The Tuning consultations among the Physics graduates (mostly in the pre-Bologna period) and their employers gave the following ranking of the generic competences (we list the first five competences only):

[16] Only short names are given here.

Graduates	Employers
Capacity for analysis and synthesis	Capacity for analysis and synthesis
Problem solving	Problem solving
Capacity to learn	Capacity to learn
Applying knowledge in practice	Applying knowledge in practice
Creativity	Teamwork

The results of the two consultations are strikingly similar. Compare with the Academics ranking (whose questionnaire however didn't include the generic skill «*problem solving*».

4. ***Workload and ECTS***

Workload of the typical degree programmes expressed in ECTS credits

Cycle	ECTS Credits
First	180-240
Second	120[17]
Third	Usually three full years

In the case of the third cycle, ECTS might be used to describe the course work and/or to give the relative amount of the coursework with respect to the doctoral research activity. Indeed a normal enthusiast doctoral student in the area of Physics may work as much as 46 hours per week along 48 weeks (i.e. more than 2200 hours per year).

Trends and differences

In the year 2002 the Tuning Network included two groups of institutions, almost equal in number:

(i) Institutions with a «Bachelors - Masters (BaMa)» organisation of studies (i.e. a two-cycle organisation, mostly according to a «3+2» scheme). The institutions were: Kobenhavn, Granada,

[17] There are exceptions, e.g. Imperial College in London.

Nijmegen, Paris VI, Trieste, Dublin City University and Patras (which adopted a «4+2» scheme).

(ii) Institutions, which offer an Integrated Masters level degree course (i.e. a single cycle organisation, without an intermediate exit after 3 years). The institutions were: Gent, Göteborg, Chalmers University of Technology, Helsinki (Physics), Imperial College London, Aveiro, Hannover, Technical University Wien.

The ***common core content*** was practically the same in the two groups. Do notice that in the case of a two-cycle organisation of studies, the identification of a *common* core content is quite feasible in the 1st cycle, but it becomes questionable in the 2nd cycle (see above).

5. *Learning, Teaching and Assessment*

Best practice in teaching, learning and assessment

Competence: Problem solving skills (first cycle) (teaching and learning)

Active Learning: in all classes (theory, lab or problem solving)

—Several questions are posed to the theory class and a certain amount of time is allowed for discussion in the same class.

—Several question-problems are set to the class and assigned to groups of students. They should find an answer (either exact or approximate) in a certain amount of time. They are also requested to explain their reasoning to other students (Did they divide the problem in simpler problems? did they use analogies with problems, for which they already knew the answer? why are they confident about their own answer?…)

—In the exercise classes the students are requested to correct and comment other students ways of solving the exercises.

—In the lab classes students are frequently asked to solve experimentally or propose ways for solving other more complex problems that may be considered extensions of the material proposed in the class. (ex: after studying an LC circuit they are encouraged to solve the problem of coupled LC circuits and think about the problem of impedance adaptation in a transmission line).

Competence: Problem solving and computer skills (first cycle) (teaching and learning)

…each of the four compulsory course units in theoretical physics, i.e., classical physics with mechanics, electrodynamics and relativity, quantum mechanics, statistical mechanics and advanced quantum mechanics with an introduction to quantum field theory, are supplemented by a computer project of 1/2 semester length». Moreover, the research training during the final master thesis work, is usually also computer-based and therefore requires and trains computational skills in varying aspects depending on the research field, being it in theoretical, experimental or applied physics.

Competence: Modelling (second cycle) (teaching and learning)

Modelling in a narrow sense means finding a simplified mathematical description of a complex phenomenon. It often means also applying tools of theoretical physics to non-physics situations.

… There is no course unit named Modelling. Students learn the modelling description of nature throughout their whole degree-course. Possible examples are: the «modelling» neglect of friction in the description of the free fall, the abundant use of harmonic oscillator for phenomena in the neighbourhood of stable equilibria, the shell model average field for nucleons in nuclei, the modelling of two-nucleon and three-nucleon forces, and so on.

The whole teaching offer is then important: in lectures, exercise classes, in lab classes, in student seminars and during research training students learn about how theories were developed, how to select and then apply theoretical tools (e.g. models) to a particular physical problem and how to model the building blocks of a theory, by adapting these latter to the experimental data description.

Competence: Learning ability (second cycle) (Teaching / learning)

The students and the teachers «are unanimous in stating that the major relevant strategy is to include in the teaching methods small individual and team project-works (either theoretical or experimental ones)». More particularly, «since our degree-course is an applied one, most of the project works include an experiment: the students are asked to measure some quantity. Before doing the experiment itself, they have to plan it (experimentally and theoretically) and explain their choices (why are they using a given experimental method, which temperature intervals will they be covering, do they have everything in the lab or do they have to build some equipment or circuit in the workshop,…). The students then go to the lab and measure whatever is necessary. Afterwards they need to learn some new physics in order to interpret the data. In the last two years some units give a weight as much as 50% and more to this type of work».

Theoretical understanding (first cycle) (Assessment)

Oral comprehensive exams are used to assess quite effectively the degree to which students have overcome difficulties in understanding and in using the understanding. Those exams are taken by the end of the 4th semester in the subjects experimental physics, theoretical physics, mathematics and in an elective subject [and in the final oral MSc exam in experimental physics, theoretical physics and in two elective subjects.

Literature search (first and second cycle) (Teaching / Learning/Assessment)

A seminar-based unit is taken by all students in years 1 and 2. It includes exercises in finding sources and in summarizing information from them. This is supported by discussions with staff and with particular instruction in use of library and internet facilities. They also are required to give presentations in Year 1 on topics resulting from literature surveys. They also will do a project in Year 1, which will include a literature survey.

The final research project (master level) will typically start with a guided literature search of a particular topic. The results of this must be reported by the student. Guidance on this is also given, in a special unit.

The students must fully engage in the above activities and present their results to the seminar leader, their tutor or their research supervisor. Performance in written summaries and oral presentations in Years 1 and 2 are assessed and given a mark. Competence in this area as part of both the 1st year project and the final research project is assessed as a specific part of the students' project assessment. The summaries of papers are marked too.

6. ***Quality enhancement***

No specific physics recommendation was produced as such. The Tuning network in Physics recognises itself in the general Tuning paper about Quality enhancement. One member of the Physics Group gave an important contribution to it. In very general terms we add here that —during the Physics SAG works— it was often stressed the importance of the educational context for the quality of the Physics degree programme, i.e. the importance of the general academic atmosphere / resources of a university and of its research environment.

References

[1] Julia GONZÁLEZ and Robert WAGENAAR, eds., *Tuning Educational Structures in Europe, Final Report, Pilot Project - Phase 1* (Deusto and Groningen, 2003.

[2] See the *Report of Working Group 1: The student experience (The questionnaire on the doctoral studies)*, pages 13-43 in «Inquiries into European Higher Education in Physics», Proceedings of the third EUPEN General Forum 99, London (GB), September 1999, edited by H. Ferdinande & A. Petit, Volume 3, Universiteit Gent, Gent 1999.

ANNEX

Relation between the Physics subject specific competences and the Dublin Descriptors (DDs)

Premise

The DDs vary and upgrade when passing from the first to the second cycle. The Tuning Physics Descriptors are the Physics subject specific competences. Their importance in each cycle was identified via a «rating procedure», carried out by several Physics academics. The rating was carried out for both 1st and 2nd cycle on each competence belonging to a list of 24 competences, which had been prepared by the Physics SAG, in co-operation with the Physics Socrates Thematic Network, named *EUPEN-EUropean Physics Education Network*. The rating produced two ordered lists of competences, one per cycle; the order identifies the priority scale or the importance of the involved competences in each cycle.

Physics competences versus DDs

We carried out the exercise of assigning each Physics competence to the appropriate «dimension(s)» of the DDs. It turns out that all competences can be *assigned to* or *labelled by* at least one among the DD dimensions, as shown in the Tables given above under the heading *Learning Outcomes and Competences - Cycle Level Descriptors.* The distribution of the Physics subject specific competences over the five dimensions of the DDs is shown in the table below (we considered the distribution of the first 17 competences in each cycle; moreover, when a competence covers more DDs, it is assigned once to each of them).

Table I

Distribution over the DDs of the first 17 Physics competences in the first and in the second cycle

Dublin Descriptor label	**Dublin Descriptor dimension**	**No. of Physics specific competences per Dublin Descriptor dimension**	
		First cycle	Second cycle
A	Knowledge and understanding	7	7
B	Applying knowledge and understanding	8	8
C	Making judgements	3	3
D	Communications skills	2	1
E	Learning skills	2	3

The distributions among the DDs involve almost the same competences in both cycles. The main remarks here are:

—all Physics competences can fit very well the DDs;
—the Physics competences mostly populate the DDs, which are labelled A or B (as to be expected);
—as to the competences counted under C, they are essentially limited to scientific judgements;
—a very limited number of competences covers two or even three different DDs (multiple fit).

Even though the above distributions over the DDs involve almost the same competences in both cycles, their rating order —however— is quite different in the two cycles, i.e. their priority/importance is felt as different by the Physics academics. It is then instructive to look at the sequence of the DDs labels, which in each cycle is generated by the ordered sequence of Physics competences. The two sequences are:

First cycle: B, A, A-B, A, B-C, B, B, A, A-B, A-B-C, …
Second cycle: B, B, E, E, B, A, A-B-C, A, A-B, A, …

We may very well say that the two sequences identify which general DDs are more relevant in each of the two Physics cycles. If we limit ourselves to the first-say-seven competences, we see that:

—the first cycle is characterised by preferred competences, which mostly fall under the labels A and B;
—the second cycle is characterised by preferred competences, which fall under the labels B and E (!). It is worthwhile noticing that in the second cycle the dimension *learning to learn* is considered to be outstandingly important.

Moreover and in more detail, if we now go back to the tables, which in the main text list the Physics specific competences, and look at the competences of the first cycle, which are labelled as A, we see that they move quite back in the rated order of importance, when passing from the first to the second cycle: indeed they are quite «general» competences, which may be supposed —so to speak— as satisfactorily developed already in the first cycle. Viceversa, several competences, which are less important or less developed in the first cycle and which are labelled as B and E, move on in the second cycle.

As a conclusion, in the present context the cycle levels are well described by the sequences of the first-say-seven competences and by their distribution over the DDs. The order describes the relative importance of the competence in the given cycle, the distribution over the DDs gives an idea of the relative weight of the 5 dimensions of the DDs in each cycle (see Table II here below).

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Table II

Distribution over the DDs of the first 7 Physics competences in the first and in the second cycle

Dublin Descriptor label	Dublin Descriptor dimension	No. of Physics specific competences per Dublin Descriptor dimension	
		First cycle	Second cycle
A	Knowledge and understanding	5	2
B	Applying knowledge and understanding	5	4
C	Making judgements	1	1
D	Communications skills	0	0
E	Learning skills	0	2

From Table II the main differences between the first and the second cycle are:

—the first cycle shows a balanced attention to both *Knowledge and understanding* and *Applying knowledge and understanding*; but the attention to *Knowledge and understanding* is rather higher than in the second cycle;

—the second cycle, which of course is still focused on *Knowledge and understanding*, nevertheless clearly privileges *Applying knowledge and understanding* and puts in the forefront the dimension *Learning skills*, this latter dimension enjoying a definitely lower preference in the first cycle.

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3

Programme design and delivery

3.1. INTRODUCTION

Tuning has given itself a threefold task: it intend to offer a theoretical-methodological framework for designing, developing and delivering study programmes based on a three cycle system, it also intends to offer practical tools and it intends to offer examples of best practices. In the first phase of Tuning much time and energy was invested to develop the concept of learning outcomes and competences. Also the transfer of ECTS from mainly a transfer system into a transfer and accumulation system of credits obtained a lot of attention.

In the second phase much more energy has been invested in the development of practical tools and the identification of examples of best practice. Tuning is based on the philosophy that faculty (academic staff) should develop their own formats for setting up and improving study programmes including its components. This is done on the basis of the expertise and experience of the staff, the context in which programmes are developed, feedback from students as well as relevant external developments. These developments are manifold. They will relate to innovation in the subject area, developments in society, but also to more general innovations in the field of higher education. The purpose of Tuning is to offer materials and insights useful for reforming higher education programmes in terms of its structure (profile, level, learning outcomes and competences, modularization, use of ECTS) but also in terms of approaches to teaching, learning and assessment.

Since the launch of ECTS in 1988-1989 surprisingly little attention has been given to the calculation of student workload, one of the basic elements of the system. Tuning has seen it as one of its tasks to develop a simple model for determining student workload in Higher Education programmes. This chapter not only contains a more theoretical description of the approach, but also includes samples of planning forms to calculate student workload and to check and correct the calculations made. For a number of subject areas these planning forms have been completed to serve as examples of good practice to help faculty staff to make reliable calculations themselves. Correct calculations of student workload are at the heart of feasible study programmes.

Preceding the paper on the calculation of student workload is a short paper in which the relationship between ECTS, student workload and learning outcomes is explained. According to the Tuning philosophy these three elements are inseparably linked. Tuning is convinced that credits can only be awarded when the learning outcomes expressed in terms of competences are achieved, but also that credits represent student workload. Tuning rejects the viewpoint that learning outcomes can be expressed in terms of credits without taking into account the notion of the time an average learner will need to achieve them.

The wording of learning outcomes in terms of competences is one thing, to teach, learn and assess competences is quite another. Therefore Tuning organized a large scale consultation process among its members. For all generic competences as well as the subject specific competences for most of the nine fields represented in Tuning good examples were provided on how to teach, learn and assess competences in the most effective way. On the basis of this consultation process a paper has been written, which not only gives some more general reflection regarding the issue but gives also practical suggestions for a selected number of generic competences. In separate papers the subject area groups give examples of good practice on how to teach, learn and assess subject specific competences. For practical reasons a selection was made among the nine subject areas. The reflections of the other subject areas can be found on the Tuning website.

3.2. ECTS, STUDENT WORKLOAD AND LEARNING OUTCOMES

The transformation of ECTS from a transfer system into a transfer and accumulation system is one of the main objectives of the Tuning project. To this end a number of important papers have been written:

- Principles of a Pan-European Credit Accumulation Framework: Good Practice Guidelines.
- Educational Structures, Learning Outcomes, Workload and the Calculation of ECTS Credits.

—Student Workload, Teaching Methods and Learning Outcomes: the Tuning Approach.

Two of these papers were prepared as part of Tuning I (2000-2002) and one as part of Tuning II (2003-2004). They have been used as a basis for the new European Commission *ECTS Users' Guide*, published in the summer of 2004.

In these papers the relationship between credit points, based on student workload and learning outcomes based on competences to be obtained by the student/learner, is explained.

In an accumulation and transfer system, credits and learning outcomes, expressed in terms of competences are inseparably linked. They are the two sides of the same coin. While credits express the volume of learning, learning outcomes express the content of that learning. Credits are only awarded when the learning outcomes are achieved by the learner. However, in general terms there is not a one to one relationship between credits and learning outcomes. The time required for the average learner or typical student to achieve the learning outcomes is decided not only by the volume of knowledge and skills to be taught and learned but also by the context in which the process of learning takes place. A countries' culture of learning, the institution, the organization of teaching, learning and assessment as well as the qualities and level of students are decisive elements in how much time the average learner will need to achieve the learning outcomes. Student time required in the given context, expressed in terms of workload, decides the number of credits. It shows at the same time that learning outcomes are in practice limited by the number of credits available for a unit as part of a study programme. In other words: learning outcomes and credits (should) keep each other in balance. In this respect, the calculation of credits is of crucial importance. Tuning offers an approach and gives examples of good practice how this calculation can be done in practice.

As an illustration of the complex relationship between credits and learning outcomes, the following example is given. This example is derived from the Common European Framework of References for Languages. In this framework different levels from A1 (very basic) to C2 (near native) are distinguished. These levels are described in learning outcomes expressed in terms of competences. Tuning states that for different groups of learners the workload (and therefore the number of credits required) will differ to obtain the same level of a competence. A typical French higher education student might need 30 ECTS-credits to achieve a competence of Spanish at level C1, while a typical Dutch student might require 60 ECTS-credits to achieve the same level. This difference is related to the fact that the starting conditions and context for the two students are different: for a Dutch student it will be easier to learn another Germanic language while for a French student it will be easier to learn another Romance language. As stated before, the effectiveness of learning and teaching pathways might also influence the amount of credits required to achieve a set of learning outcomes. In other words, the example shows that we can not say in an arbitrary way that the C1 learning outcome equals an x amount of credits for all learners regardless their context. The x will be different for every country and might differ from provider to provider, depending on the effectiveness of the learning process.

Tuning differentiates between learning outcomes and competences. This distinction is made to show the different roles of teaching staff and students or learners. Learning outcomes are formulated by staff on the level of a study programme as well as single course or learning units. Competences are obtained by the learner. The level of competences obtained by the learner can be lower or higher than determined by the learning outcomes. The level of competences obtained is expressed in a mark or grade. Competences are not linked to one unit, but are developed during the total learning process of a study programme.

In practice two types of learning outcomes are used: so-called threshold learning outcomes, which determine the pass level, and so-called desired learning outcomes. Desired learning outcomes express what the teaching staff expects from the typical learner in terms of the level of competences to be obtained. Tuning has a preference for the concept of desired learning outcomes, because —at least at present— it seems to fit better in the teaching and learning culture of the vast majority of European countries.

Prepared by Robert Wagenaar

3.3. STUDENT WORKLOAD, TEACHING METHODS AND LEARNING OUTCOMES: THE TUNING APPROACH

The need

While many countries in Europe are preparing the implementation of a two cycle system in accordance with the Bologna process, it becomes increasingly clear that there is a need to provide some simple reference points with regard to student workload. The issue of workload is related to the introduction of the ECTS credit system, both as a transfer and an accumulation system. ECTS is one of the tools for promoting comparability and compatibility in European Higher Education. The need for having clear agreed reference points also arises from the demand for transparency and fairness to students[18].

ECTS principles

The European Credit Transfer and Accumulation System, abbreviated as ECTS, is a student-centred system based on the student workload required to achieve the objectives of a programme, objectives specified in terms of the learning outcomes and competences to be required. ECTS is based on a number of principles[19]:

- 60 credits measure the workload of a full-time student during one academic year. The student workload of a full-time study programme in Europe amounts in most cases to around 1500-1800 hours per year and in those cases one credit stands for around 25 to 30 working hours[20].
- Credits in ECTS can only be obtained after successful completion of the work required and appropriate assessment of the learning outcomes achieved. Learning outcomes are sets of competences, expressing what the student will know, understand or be able to do after completion of a process of learning, long or short.
- Student workload in ECTS consists of the time required to complete all planned learning activities such as attending lectures, seminars, independent and private study, placements, preparation of projects, examinations, and so forth.
- Credits are allocated to all educational components of a study programme (such as modules, courses, placements, dissertation work, etc.) and reflect the quantity of work each component requires to achieve its specific objectives or learning outcomes in relation to the total quantity of work necessary to complete a full year of study successfully.

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[18] The term student is used in this paper for any type of learner.

[19] A detailed description of the ECTS features can be found in the ECTS Users' Guide, which is available on the Europa Internet server of the European Commission:
http://europa.eu.int/comm/education/programmes/socrates/ects/index_en.html.

[20] In second cycle full time programmes of studies we can distinguish two types: normal course programme which have an official load of 60 credits and so-called *intensive programmes* of a full calendar year (e.g. 12 months programmes, in stead of a 9 to 10 months programmes) can have a maximum load of 75 credits (which equals 46 to 50 weeks).

The project *Tuning Educational Structures in Europe,* which focuses on learning outcomes and general academic (generic) competences and subject related competences, has shown us that approaches to teaching, learning and assessment have an impact on the workload required to achieve the desired learning outcomes and, consequently, on credit allocation[21]. Workload, teaching methods and learning outcomes are clearly related to each other. However, there are other relevant elements. In achieving the desired learning outcomes a large number of interrelated factors play a role. The diversity of traditions has to be taken into account, as well as curriculum design and context,, coherence of the curriculum, teaching organisation, ability and diligence of the student. In other words, the time required to achieve the same learning outcomes may vary according to the context[22].

An approach for determining student workload in Higher Education programmes

When deciding on the student workload the following elements are of relevance:

- —The student has a fixed amount of time depending on the programme he/she is taking.
- —The overall responsibility for the design of a programme of studies and the number of credits allocated to courses lies with the responsible legal body, e.g. faculty executive board, etc.

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[21] The definition of learning outcomes agreed upon in the Tuning project is the following: S*tatements of what a learner is expected to know, understand and/or be able to demonstrate after completion of learning. They can refer to a single course unit or module or else to a period of studies, for example, a first or a second cycle programme. Learning outcomes specify the minimum requirements for award of credit*. Learning outcomes are formulated by academic staff.

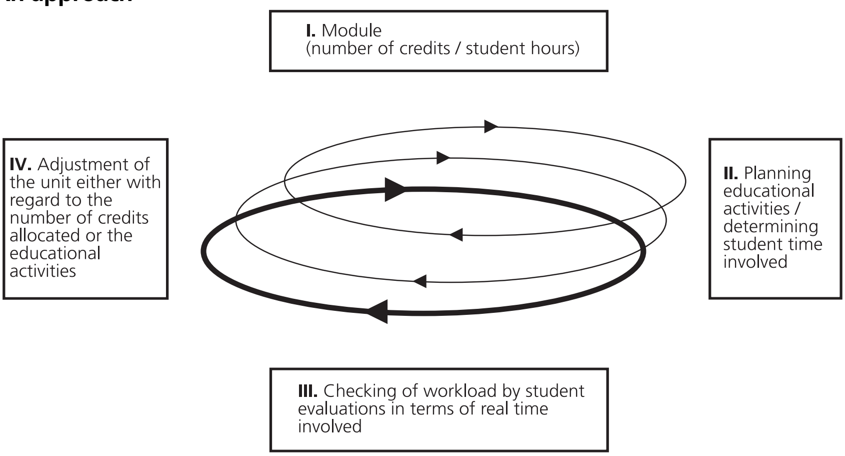
The Tuning Project focuses on subject specific competences and generic competences. These competences represent a dynamic combination of knowledge, understanding, skills, abilities and values. Fostering these competences are the object of educational programmes. Competences, which are obtained by the student, will be formed in various course units and assessed at different stages.

Learning outcomes according to Tuning methodology should be formulated in terms of competences. Competences may be developed to a greater degree than the level required by the learning outcome.

[22] «Educational Structures, Learning Outcomes, Workload and the Calculation of ECTS Credits», in Julia Gonzalez and Robert Wagenaar, eds., *Tuning Educational Structures in Europe. Final report - Phase One* (Bilbao and Groningen 2003).

—The final responsibility for deciding on the teaching, learning and assessment activities for a particular amount of student time is delegated by faculty and university authorities to the teacher or the responsible team of staff.
—It is crucial that the teacher be aware of the specific learning outcomes to be achieved and the competences to be obtained.
—The teacher should reflect on which educational activities are more relevant to reach the learning outcomes of the module / course unit.
—The teacher should have a notion of the average student work time required for each of the activities selected for the module / course unit.
—The student has a crucial role in the monitoring process to determine whether the estimated student workload is realistic, although monitoring is also a responsibility of the teaching staff.

An approach



Four steps

To realize the overall objective, namely the development of an approach which leads to a truly valid consideration of a student's workload, implementation of the following four steps is recommended.

I. *Introducing modules/course units*

A choice must be made between the use of a modularized or a non-modularized system. In a non-modularized system each course unit can

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have a different number of credits although the total credits for each academic year will still be 60. In a modularized system the course units/modules have a fixed number of credits, 5 credits for example, or a multiple of this number. The use of a modularized system in an institution facilitates the use of the same modules by students enrolled in different programmes.

II. *Estimating student workload*

The workload of a module/course unit is based on the total amount of learning activities a student is expected to complete in order to achieve the foreseen learning outcomes. It is measured in time (in work hours); for example, a module of 5 credits allows for around 125-150 hours of work of a typical student.

Educational activities can be defined by considering the following aspects:

— *Modes of instruction (types of teaching and learning activities):* lecture, seminar, research seminar, exercise course, practical, laboratory work, guided personal study, tutorial, independent studies, internship, placement or «stage», fieldwork, project work, etc.
— *types of learning activities:* attending lectures, performing specific assignments, practising technical or laboratory skills, writing papers, independent and private study, reading books and papers, learning how to give constructive criticism of the work of others, chairing meetings, etc.
— *types of assessment:* oral examination, written examination, oral presentation, test,, paper/essay, portfolio, report about an internship, report on fieldwork, continuous assessment, (final) thesis/dissertation, etc.

Teachers estimate the time required to complete the activities foreseen for each course unit / module. The workload expressed in time should match the number of credits available for the course unit. Teachers must develop suitable strategies to use the time available to best advantage.

III. *Checking the estimated workload through student evaluations*

There are different methods to check whether the estimated student workload is correct. The most common method is the use of questionnaires to be completed by students, either during the learning process or after the completion of the course.

IV. *Adjustment of workload and/or educational activities*

The outcome of the monitoring process or an updating of the course content might lead to an adjustment of the workload and/or the type of educational activities of the course unit/module. In a modularized model it will be necessary to adjust the amount of learning material and/or the types of teaching, learning and assessment activities, because the number of credits (e.g., in our example, 5 or a multiple of 5) is fixed. In a non-modular model also the number of credits can be changed, but this will, of course, have an effect on other units, because the total number of credits of the programme of study is fixed (e.g. 30 per semester, 60 per year etc.). An adjustment of workload and/or activities is required anyway when the monitoring process reveals that the estimated student workload does not correspond to the actual workload.

Explanatory note regarding the use of the Tuning model in practice

The Tuning approach is based on the correlation of a number of decisive elements:

- —the degree profile which indicates the place of the module in the overall programme of studies, as well as the competences to be developed in the module;
- —the target group, the level of the module and any existing entrance requirements;
- —the learning outcomes formulated for the module;
- —the educational activities which best suit the learning outcomes to be achieved;
- —the types of assessment that are considered most appropriate to the learning outcomes;
- —the average work time (in hours), based on student workload, required to perform the educational activities which are necessary to achieve the learning outcomes.

Tuning offers *two forms* that can be helpful in making decisions on and adjustment of the student workload. The first form is for the teacher to plan the educational module and estimate the student working hours involved. The second is for the student to indicate the actual amount of time spent on the module, thus providing an opportunity to check whether the estimated workload corresponds to reality. Students are given the form completed by the teacher where only the estimated workload is not shown. By using these forms both teacher and students become aware of the learning outcomes, their relationship to the competences being developed and the average student time involved for each of the tasks.

Samples of the two forms are attached to this paper together with examples of how they could be used in practice for a different number of subject areas.

The first example focuses on generic competences which, in the Tuning consultation process with graduates, employers and academics, were ranked lower in the learning process. Furthermore, a combination of educational activities has been chosen, which covers different approaches to teaching, learning and assessment. This is only to illustrate how these approaches can be used. **A typical course unit might be expected to be much more straightforward and therefore easier to plan.** Finally, it has to be stressed that the example does *not* intend to give an indication about the number of lectures per credit, the most appropriate educational activities, or possible titles for lectures, etc. The hypothetical example is **only intended to serve as a tool** for discussion and a practical way to show how competences, learning outcomes, educational activities, levels, credits and student workload are related.

This hypothetical example is followed by practical examples from different disciplines. All examples are intended to help the teaching staff to make its own calculations and judgements with regard to the number of ECTS credits to allocate to a teaching unit.

Prepared by Julia González and Robert Wagenaar

Tuning
Tuning Educational Structures in Europe

PLANNING FORM FOR AN EDUCATIONAL MODULE
(to be completed by the teacher)

Programme of Studies: . . . .

Name of the module / course unit: . . . .
. . . .

Type of course (e.g. major, minor, elective):. . . . .

Level of the module / course unit (e.g. BA, MA, PhD): . . . .

Prerequisites:. . . . .

Number of ECTS credits: . . . .

Competences to be developed:

1. . . . .
2. . . . .
3. . . . .
4. . . . .
5. . . . .
6. . . . .

Learning outcomes	**Educational activities**	**Estimated student work time in hours**	**Assessment**

Tuning
Tuning Educational Structures in Europe

FORM FOR CHECKING WORKLOAD OF AN EDUCATIONAL MODULE
(to be completed by the student)

Programme of Studies: . . . .

Name of the module / course unit: . . . .
. . . .

Type of course (e.g. major, minor, elective): . . . .

Level of the module / course unit (e.g. BA, MA, PhD): . . . .

Prerequisites: . . . .

Number of ECTS credits: . . . .

Competences to be developed:

1. . . . .
2. . . . .
3. . . . .
4. . . . .
5. . . . .
6. . . . .

Learning outcomes	**Educational activities**	**Estimated student work time in hours**	**Assessment**

Tuning
Tuning Educational Structures in Europe

FORM FOR CHECKING WORKLOAD OF AN EDUCATIONAL MODULE
(to be completed by the teacher)

Programme of Studies: . . . .

Name of the module / course unit: Intercultural Communication in Multicultural Societies

Type of course (e.g. major, minor, elective): Elective course unit

Level of the module / course unit (e.g. BA, MA, PhD): Bachelor

Prerequisites: . . . .

Number of ECTS credits: 5 ECTS (average student working time: 125 hours)

Competences to be developed:

1. Appreciation of diversity and multiculturality (related to modules X, Y, Z).
2. Capacity to work in multicultural contexts (related to modules A, Z, J).
3. Teamwork (related to modules …).
4. Oral and written communication (related to modules …).
5. Capacity for applying knowledge in practice (related to modules …).
6. Understanding of cultures and customs of other countries.
7. Capacity to understand structures of cultural systems (related to modules …).
8. Capacity to have an independent judgement on current related issues.

<table>
<tr><th>Learning outcomes</th><th>Educational activities</th><th>Estimated student work time in hours</th><th>Assessment</th></tr>
<tr><td rowspan="14">Familiarity with diverse approaches to culture and understanding of their implications.

Understanding and capacity to use in an adequate academic context key concepts such as cultural identity, multiculturalism, integration, assimilation, segregation, context and meaning, etc.

Development by the student of his or her own mental frameworks in relation to:

a) the various layers of culture
b) the key issues in the current debate concerning different degrees of tolerance of cultural symbols</td><td>Background questionnaire</td><td>½ hour</td><td rowspan="14">Class Participation *
(40%)

Oral presentations (all groups)
(12%)</td></tr>
<tr><td>Lecture 1: Approaches to culture</td><td>1 hour</td></tr>
<tr><td>Group work on definitions of culture</td><td>1 hour</td></tr>
<tr><td>Class discussion</td><td>1 hour</td></tr>
<tr><td>Reading assignment</td><td>5 hours</td></tr>
<tr><td>Class seminar on reading assignment</td><td>½ hour</td></tr>
<tr><td>Lecture 2: Perception and Culture</td><td>1 hour</td></tr>
<tr><td>Reading assignment on the lecture</td><td>3 hours</td></tr>
<tr><td>Class seminar on reading assignment</td><td>½ hour</td></tr>
<tr><td>Lecture 3: Cultural identities, group, individual and society</td><td>1 hour</td></tr>
<tr><td>Reading assignment on the lecture</td><td>5 hours</td></tr>
<tr><td>Class seminar on reading assignment</td><td>½ hour</td></tr>
<tr><td>Lecture 4: Symbols, heroes and values</td><td>1 hour</td></tr>
<tr><td>Writing and presentation of Team work 1: Cultural symbols in the current debate in newspapers (search for relevant articles on the web, setting up of individual dossiers, reading and analysis)</td><td>15 hours

3 hours</td></tr>
<tr><td rowspan="3">Understanding and being able to identify the different dimensions of cultural differences in approaches to: space, time, equity, hierarchy, high-low context, etc</td><td>Group work on 8 short case studies followed by class debate</td><td></td><td rowspan="3">One written case study to be analysed
(10%)</td></tr>
<tr><td>Presentation of the theoretical perspective on the cultural dimension</td><td>1 and ½ × 8 = 12 hours</td></tr>
<tr><td>Background reading of selected texts</td><td>12 hours

1 hour</td></tr>
</table>

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment*
Understanding processes of a) acculturation a) transition from ethnocentrism to ethnorelativism and capacity to articulate own /somebody else's processes	Lecture 5: *Presentation of Bennet's model,* followed by critical perspective by the group.	1 hour	Write a two-page report based on personal experience (8%)
	Lecture 6: *Process of acculturation,* followed by identification of significant steps by the group	1 hour	
	Reading assignment	4 hours	
	Personal reflection of themes presented in the lectures	1 hour	
		3 hours	
Understanding obstacles and roads to intercultural communication. Development of comprehensive listening and capacity to answer in the appropriate cultural key Development of an attitude of respect and appreciation of diversity	Panel of presenters from different cultures and debate. Reflection exercise	3 hours	* Self-evaluation (with guides) (8%)
	Lecture 7: *Intercultural Communication. Key issues*	1 hour	
	Reading assignment	3 hours	
	Personal reflection of themes presented in the lectures	1 hour	
	Film: «No Man´s Land».	2 hours	
	Class Discussion about the film	1 hour	
	Lecture 8: *The role of perception in intercultural communication*	1 hour	
	Reading assignment	2 hours	
	Which are the main three points of the assigned reading? Debate in class	2 hours	
	Visit to NGO or other type of organisation that works with people from other cultures	3 hours	

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment*
Understanding the current challenge of migration and the possible solutions for the future	Lecture 9: *Value of Diversity. Migration: variety at our door*	1 hour	Oral presentations (all groups) (12%)
	Reading assignment	5 hours	
	Class seminar on reading assignment	1 hour	
	Lecture 10: *Managing Diversity*	1 hour	
Understanding of the debate about models of society and policies for different cultures and migrant groups	Lecture 11: *Images and reality of Multiculturalism*	1 hour	
	Writing and presentation of Team work 2: *Towards Cultural Cohesion. Solutions, laws and policies in Multicultural State* (search for relevant information, reading and analysis)	15 hours 3 hours	
Awareness of different approaches and issues in research in intercultural communication	Lecture 12: *Main research approaches*	1 hour	Learning Report (10%)
	Group work on Different Research issues	1 hour	
	Preparation of Learning Report	3 hours	
		1 hour	

Total: **125 hours** **100%**

* Class participation, which includes attendance, preparation of reading assignment and class discussion. This relates to the whole course.

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Tuning
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FORM FOR CHECKING WORKLOAD OF AN EDUCATIONAL MODULE
(to be completed by the student)

Programme of Studies:	—
Name of the module / course unit:	Intercultural Communication in Multicultural Societies
Type of course:	Elective course unit
Level of the module / course unit:	Bachelor
Prerequisites:	—
Number of ECTS credits:	5 ECTS (average student working time: 125 hours)

Main competences to be developed:

1. Appreciation of diversity and multiculturality (related to modules X, Y, Z).
2. Capacity to work in multicultural contexts (related to modules A, Z, J).
3. Teamwork (related to modules …).
4. Oral and written communication (related to modules …).
5. Capacity for applying knowledge in practice (related to modules …).
6. Understanding of cultures and customs of other countries.
7. Capacity to understand structures of cultural systems (related to modules …).
8. Capacity to have an independent judgement on current related issues.

Learning outcomes	Educational activities	Estimated student work time in hours	Assessment
Familiarity with diverse approaches to culture and understanding of their implications. Understanding and capacity to use in an adequate academic context key concepts such as cultural identity, multiculturalism, integration, assimilation, segregation, context and meaning, etc. Development by the student of his or her own mental frameworks in relation to: a) the various layers of culture b) the key issues in the current debate concerning different degrees of tolerance of cultural symbols	Background questionnaire		Class Participation * (40%)
	Lecture 1: *Approaches to culture*		
	Group work on definitions of culture		
	Class discussion		
	Reading assignment		
	Class seminar on reading assignment		
	Lecture 2: *Perception and Culture*		
	Reading assignment on the lecture		Oral presentations (all groups) (12%)
	Class seminar on reading assignment		
	Lecture 3: *Cultural identities, group, individual and society*		
	Reading assignment on the lecture		
	Class seminar on reading assignment		
	Lecture 4: *Symbols, heroes and values*		
	Writing and presentation of Team work 1: *Cultural symbols in the current debate in newspapers* (search for relevant articles on the web, setting up of individual dossiers, reading and analysis)		
Understanding and being able to identify the different dimensions of cultural differences in approaches to: space, time, equity, hierarchy, high-low context, etc	Group work on 8 short case studies followed by class debate		One written case study to be analysed (10%)
	Presentation of the theoretical perspective on the cultural dimension		
	Background reading of selected texts		

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment*
Understanding processes of a) acculturation a) transition from ethnocentrism to ethnorelativism and capacity to articulate own /somebody else's processes	Lecture 5: *Presentation of Bennet's model,* followed by critical perspective by the group.		Write a two-page report based on personal experience (8%)
	Lecture 6: *Process of acculturation,* followed by identification of significant steps by the group		
	Reading assignment		
	Personal reflection of themes presented in the lectures		
Understanding obstacles and roads to intercultural communication. Development of comprehensive listening and capacity to answer in the appropriate cultural key Development of an attitude of respect and appreciation of diversity	Panel of presenters from different cultures and debate. Reflection exercise		* Self-evaluation (with guides) (8%)
	Lecture 7: *Intercultural Communication. Key issues*		
	Reading assignment		
	Personal reflection of themes presented in the lectures		
	Film: «No Man´s Land».		
	Class Discussion about the film		
	Lecture 8: *The role of perception in intercultural communication*		
	Reading assignment		
	Which are the main three points of the assigned reading? Debate in class		
	Visit to NGO or other type of organisation that works with people from other cultures		

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment*
Understanding the current challenge of migration and the possible solutions for the future Understanding of the debate about models of society and policies for different cultures and migrant groups	Lecture 9: *Value of Diversity. Migration: variety at our door*		Oral presentations (all groups) (12%)
	Reading assignment		
	Class seminar on reading assignment		
	Lecture 10: *Managing Diversity*		
	Lecture 11: *Images and reality of Multiculturalism*		
	Writing and presentation of Team work 2: *Towards Cultural Cohesion. Solutions, laws and policies in Multicultural State* (search for relevant information, reading and analysis)		
Awareness of different approaches and issues in research in intercultural communication	Lecture 12: *Main research approaches*		Learning Report (10%)
	Group work on Different Research issues		
	Preparation of Learning Report		
Total:		**—**	**100%**

* Class participation, which includes attendance, preparation of reading assignment and class discussion. This relates to the whole course.

Tuning
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PLANNING FORM FOR AN EDUCATIONAL MODULE
(Completed by the teacher)

Programme of Studies:	BSc Chemistry
Name of the course unit:	Organic Practical Laboratory (forms part of Module OC-3)
Type of course (Target group):	Major (Second year Bachelor students)
Level of the course unit:	Bachelor
Entrance requirements:	Inorganic Chemistry (pass), Toxicology (attendance)
Number of ECTS credits:	7.5 (workload is 186 hours; 1 credit = 25 hours) work). Credits not awarded separately but as part of a module theory/practice.

Main competences to be developed:

1. Capacity for applying knowledge in practice
2. Planning and time management
3. Ability to work autonomously
4. Concern for quality
5. Skills in the safe handling of chemical materials, taking into account their chemical and physical properties, including any specific hazards associated with their use.
6. Skills required for the conduct of standard laboratory procedures involved and use of instrumentation in synthetic work in relation to organic systems.
7. Ability to conduct risk assessments concerning the use of chemicals and laboratory procedures.

Learning outcomes	Educational activities	Estimated student work time in hours	Assessment
Safety procedures, laboratory hazards, emergency procedures.	Safety lecture with demonstration	1	None
Competence in the planning and design of practical experiments.	Reading and understanding experimental procedures and the reasons behind them. Preparation for carrying out experiments.	30	Discussions with teaching assistants
Ability to report an experimental procedure in such a way that it can be carried out successfully and safely by others.	Report-writing	15	Report assessment by teaching assistants
Correct use of laboratory apparatus. Separation, isolation, purification.	Experiment 1: Natural product isolation	8	Written report. Quality of product
Reactivity and selectivity. Reactivity and selectivity. Characterisation of mixtures. Correct use of laboratory apparatus.	Experiment 2: Free radical substitution of hydrocarbons	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 3: Nucleophilic aliphatic substitution	8	Written report. Quality of product
Reactivity and selectivity. Characterisation of mixtures. Correct use of laboratory apparatus.	Experiment 4: Elimination to form CC multiple bonds	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 5: Electrophilic addition to multiple bonds	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 6: Electrophilic aromatic substitution 1 (heterosubstituents)	8	Written report. Quality of product

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment*
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 7: Formation of carbonyl groups via oxidation	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 8: Reduction of carbonyl compounds	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 9: Addition of heteronucleophiles to aldehydes and ketones	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Characterisation of mixtures. Correct use of laboratory apparatus.	Experiment 10: Addition of carbon nucleophiles to the carbonyl group	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 11: Electrophilic aromatic substitution 2 (CC bond formation)	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 12: Organometallic compounds	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 13:Enolate chemistry and aldol reactions, conjugate addition	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 14: Hetero-multiple bond systems (nitro- and diazo compounds, etc.)	8	Written report. Quality of product
Reactivity and selectivity. Substance characterisation. Correct use of laboratory apparatus.	Experiment 15: Preparation and modification of polyfunctional compounds and heterocycles	8	Written report. Quality of product
General overview of subject material.	Revision of material learned, examination.	20	Oral examination

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Tuning
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PLANNING FORM FOR AN EDUCATIONAL MODULE
(Completed by the teacher)

Programme of Studies:	Earth Sciences Honours Degree, 3rd year of a 4 year B.Sc.
Name of module/course unit:	Field mapping of solid geology and surficial deposits
Type of course:	Major
Level of the module/course unit:	Bachelors
Prerequisites:	GE200 (2nd year Geology)
Number of ECTS credits:	10 (222-240 hours; 1 credit = 22-24 hours)

Main generic competences to be developed[23]:

1. Capacity for analyses and synthesis.
2. Capacity for organisation and planning.
3. Teamwork.
4. Capacity for applying knowledge in practice.
5. Capacity to adapt to new situations.

Main specific competences to be developed:

6. The ability to accurately record field data using a variety of techniques.
7. Preparation and maintenance of field notebooks, field slips.
8. The preparation of reports and interpretive maps using appropriate IT and manual techniques.
9. The techniques for collection and subsequent laboratory analysis of field samples.
10. The ability to link outcrop data into a four dimensional model describing the geological evolution of the region.
11. The preparation of maps, sections and diagrams to illustrate this 4D analysis.

[23] A considerable number of competences, both specific and generic, are developed during intensive field work classes where the students are working on their own or in small groups. This is because they are holistic and encourage the student to integrate much of the theoretical and practical material absorbed in the class and through reading to solve a real world problem. The example used here is for a basic geological mapping course. A geophysical survey, environmental or hydro-geological mapping or a short oceanographic cruise would develop a similar variety of competences.

Learning outcomes	Educational activities	Estimated student work time in hours	Assessment
Introduction to field safety: The ability to plan and execute a safe day's work in the field.	2 hours Lecture and 2 day field exercise with optional CPR and 1st Aid courses	22-40	Continuous: by qualified safety instructors. No formal mark, but certificates awarded to all who pass.
Field course: The ability to collect earth science data in the field, to analyse and archive this data.	7 days supervised field work. First two days working in groups closely supervised by lecturers who define the task to be completed. Four days working semi-independently in small groups (2-4 persons) and one day site visit to a slate quarry.	100; 8-10 hours each day in the field and up to 3 hours each evening 'mapping in' (analysing, consolidating and plotting data collected that day). Travel time: home to/from locality – 2 days	Continuous assessment: = 50% of total
Preparation of short report on data collected in the field. The ability to concisely integrate and summarise earth science data collected in the field. The ability to prepare and understand geological maps.	Working in a small group (2-4 persons) back in laboratory: describing material collected; preparing neat copy maps, plans, diagrams and cross sections; preparing a concise report on stratigraphy; structure; surficial deposits; economic potential and environmental aspects of area studied.	80	Submission of project by a deadline, which is then marked. = 50% of total.
Revision Field Trip	2 day revision field trip to rehearse skills necessary before undertaking independent field project	20	

Tuning
Tuning Educational Structures in Europe

PLANNING FORM FOR AN EDUCATIONAL MODULE
(Completed by the teacher)

Programme of Studies:	European Studies in Business and Economics
Name of module/course unit:	Agricultural, Environmental and Regional Policy of EU
Type of course:	Compulsory
Level of module/course unit:	Second cycle (master)
Prerequisites:	Completed first cycle programme
Number of ECTS credits:	6 (workload is 180 hours; 1 credit = 30 hours)

Main competences to be developed:

1. Developing knowledge concerning ideas and concepts regarding the European integration process.
2. Understanding of EU institutions and decision making policies..
3. Ability to use different disciplinary methodologies in an integrated way
4. Ability to interpret European events, developments and policies in national, regional and local frameworks.
5. Ability to communicate in own and an international language using the appropriate terminology.
6. Ability to work independently.
7. Ability to follow and interpret EU policies critically.

Learning outcomes	Educational activities	Estimated student work time in hours	Assessment
Understanding principles of agricultural policy, its relation to economic policy, development of agricultural policy in Europe and in the world	Lecture 1 *Agricultural policy, relation to economic policy* and *Development of agricultural policy in Europe and in the world* Lecture 2 *Agricultural policy conception in Europe and in the world* Seminar	2 2 2	Lecture 1-5: Class participation***** (10% -for the whole course) Oral team work presentation (10%)
Making students familiar with Common agricultural policy of EU, trends, main characteristics, forms and sources of finance	Lecture 3 *Common agricultural policy of EU, trends, main characteristics, forms and sources of finance* Individual studies Team work Writing and presentation of team work	4 8 2 6	
Analysis of instruments of agricultural policy	Lecture 4 *Analysis of instruments of agricultural policy;* Seminar	4 4	
Awareness of sustainable development of agriculture, production and extraproduction function of agriculture	Lecture 5 *Sustainable development of agriculture, production and extraproduction function of agriculture* Reading assignment on the lecture	1 1	
Awareness of the substance of environmental problems	Lecture 6 *Substance of environmental problems* Seminar	1 1	Lecture 6-10: Class participation***** Oral team work presentation (10%)
Familiarity with divert approaches to environment assessment	Lecture 7 *Environment assessment* Seminar	2 2	
Understanding of the possibilities of economic analysis of pollution	Lecture 8 *Possibilities of economic analysis of pollution* Seminar	2 2	

Learning outcomes	***Educational activities***	***Estimated student work time in hours***	***Assessment***
Familiarity with renewability and unrenewability of natural resources, economical use of these resources	Lecture 9 *Renewability and unrenewability of natural resources* Seminar	2 2	
Understanding of the principles of Environmental policy of EU	Lecture 10 *Principles of Environmental policy of EU* Seminar Team work Individual Studies Writing and presentation of team work	2 2 4 6 6	
Understanding of Regional policy of EU	Lecture 11 *Regional policy of EU* Team work Case study Project work Individual project presentation	6 2 2 10 6	Lecture 11-12: Class participation***** Oral project work presentation (20%)
Awareness of socially and environmentally sustainable regional development	Lecture 12 *Socially and environmentally sustainable regional development* Seminar	1 1	
Development of the general overview of subject material.	Individual studies Combined exam	80 2	Combined exam - written and oral (50%)

***** Includes attendance and class discussion.

PLANNING FORM FOR AN EDUCATIONAL MODULE
(Completed by the teacher)

Programme of Studies: Mathematics

Name of module/course unit: Differentiation and Integration

Target group: First cycle students in Mathematics, Physics

Level of the module/course unit: Bachelor level 1

Number of ECTS credits: 10 (workload is 300 hours; 1 credit = 30 hours)

Competences to be developed:

1. Profound knowledge of basic techniques in the theory of series, differentiation and integration.
2. Understanding the principles that provide these basic techniques.
3. Knowledge and understanding of logical and deductive arguments.
4. Capacity of using formal arguments and notations in mathematical proofs.
5. Capacity for localization of assumptions within the proofs of Theorems.
6. Capacity of finding rigorous proofs of small problems.
7. Development of capacity using methods of analysis to problems in applications.

Learning outcomes	Educational activities	Estimated student work time in hours
week 1		
To understand the basic concepts of logic that underlie all mathematical reasoning. Calculating truth tables. Translating verbal expressions into logical terms and conversely	Lecture 1 Logical operators, logical equivalence and logical consequence. Basic notations of set theory. Negation of statements with quantifiers	1.5
	Study of lecture 1	4
Familiarity with applying the principle of induction with binomial coefficients and with Pascal's triangle.	Lecture 2 Short axiomatic introduction of **N**, **Z**, **Q**, **R**. The principle of induction. Binomial Theorem. **R** as ordered field.	1.5
Familiarity with manipulation of inequalities. Knowledge about the difference of ***Q*** and ***R.***	Lecture 3 (= Problems class) Absolute value. Inequalities. Supremum and infimum of subsets of ***R.*** Axiom of Archimedes. Axiom of completeness. Density of ***Q*** in ***R***.	1.5
	Study of Lectures 2 and 3	4
week 2		
To understand the concept of convergence in epsilon-N notation To learn the difference between limits and limit points. To be able to apply limit theorems	Lecture 4 Convergence of sequences. Limit points. Theorem of Bolzano-Weierstrass. Algebra of limit theorems. Limit superior and inferior.	1.5
	Study of lecture 4	4
Knowledge about connection between sequences and series. Calculation of elementary series.	Lecture 5 Cauchy sequences. Completeness of **R**. Definition of powers. Series and examples of series.	1.5
	Study of lecture 5	4
	Problems class 1	1.5
	Time for homework 1	10

Learning outcomes	*Educational activities*	*Estimated student work time in hours*
	week 3	
To be able to apply the different tests for convergence (ratio, alternating, *n*th root test). Practical calculation of the Cauchy product.	Lecture 6 Conditional and absolute convergence. Tests for convergence of series. Operations involving series. Cauchy product.	1.5
	Study of lecture 6	4
Familiarity with the ε-δ notation of limits of functions.	Lecture 7 Functions and graphs. Operations of functions. Injective, surjective, inverse functions. Monotonicity, boundedness and limits of functions	1.5
	Study of lecture 7	4
	Problems class 2	
	Time for homework 2	
	week 4	
Calculation of limits of functions. Decision (by arguments) whether a function is continuous or not.	Lecture 8 Limit theorems for functions. Continuity. The intermediate-value theorem. Uniform continuity.	1.5
	Study of lecture 8	4
To learn the importance of uniform convergence concerning interchanging of limit processes. To decide whether a sequence or series of functions is p.w. or uniform convergent (or not).	Lecture 9 Pointwise and uniform convergence of functions. Interchange of limit and continuity. Cauchy Criterion for sequences and series of functions. Weierstrass M-test.	1.5
	Study of Lecture 9	4
	Problems class 3	1.5
	Time for homework 3	10

Learning outcomes	Educational activities	Estimated student work time in hours
	week 5	
Calculation of the interval of convergence. To learn the importance of limes superior.	Lecture 10 Power series. Radius of convergence. Properties of power series. Series expansion for e^x	1.5
	Study of Lecture 10	4
Deduction of trigonometrical identities from the addition theorems for sine and cosine.	Lecture 11 Cauchy functional equations. Introduction of x(cx, cx, c.ln x, xc. Introduction of sine and cosine by power series. Addition theorems.	1.5
	Study of Lecture 11	4
	Problems class 4	1.5
	Time for homework 4	10
	week 6	
Knowing the graphs and properties of all elementary circular-, area-functions and their inverses	Lecture 12 Equality of sine and the geometrically defined sine. Circular functions, hyperbolic functions and their inverses. Representation of the area-functions by logarithmic functions.	1.5
	Study of Lecture 12	4
To understand that differentiation is local approximation by a linear mapping. To be able to apply the rules for differentiation.	Lecture 13 Different characterizations of the derivative. Rules for differentiation. Chain rule	1.5
	Study of Lecture 13	4
	Problems class 5	1.5
	Time for homework 5	10

Learning outcomes	*Educational activities*	*Estimated student work time in hours*
	week 7	
To be able to deduce derivatives of inverse functions and to obtain inequalities by means of the mean value theorem.	Lecture 14 The derivative of the inverse function. Mean value theorems Monotonicity and differentiation.	1.5
	Study of Lecure 14	4
Manipulating derivatives of power series within the radius of convergence.	Lecture 15 Interchange of limit and derivative. Derivatives of functions defined by power series. Examples.	1.5
	Study of Lecture 15	4
	Problems class 6	1.5
	Time for homework 6	10
	week 8	
To be able to apply Leibniz's rule and to produce the (formal) Taylor series of a given function.	Lecture 16 The *n*th derivative of the elementary functions. Leibniz's Theorem. Theorem of Taylor.	
	Study of Lecture 16	4
To understand the ideas centred round Taylor's Theorem. To calculate power series of simple and more complicated functions.	Lecture 17 Expansion of functions into power series. Application of Cauchy multiplication.	1.5
	Study of Lecture 17	4
	Problems class 7	1.5
	Time for homework 7	10

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Learning outcomes	*Educational activities*	*Estimated student work time in hours*
week 9		
To be able to investigate functions and to draw their graphs.	Lecture 18 Convex and concave functions. Relative and absolute extrema. Points of inflection. Examples.	1.5
	Study of Lecture 18	4
To understand the concept of limits like lim $_x$((= -(To be able to apply the different versions of L'Hospital's rule.	Lecture 19 Extension of R to R({-(,(}. L'Hospital's Rule. Examples.	1.5
	Study of Lecture 19	4
	Problems class 8	1.5
	Time for homework 8	10
week 10		
To be able to present the idea of the Riemann integral.	Lecture 20 Survey on different integrals. Definition of Riemann integral. Riemann integrable functions.	1.5
	Study of Lecture 20	4
Calculation of infinite series by using results on Riemann integrals.	Lecture 21 Darboux's Theorem. The vector space of R-integrable functions. Mean value theorems.	1.5
	Study of Lecture 21	4
	Problems class 9	1.5
	Time for homework 9	10

Learning outcomes	*Educational activities*	*Estimated student work time in hours*
week 11		
To understand that integration is not simply «anti-differentiation». Knowledge of the antiderivatives of elementary functions.	Lecture 22 Fundamental Theorem of Calculus. Change of variable theorem. Interchange of limit and integral.	1.5
	Study of Lecture 22	4
To learn manipulative skills of the technique of integration.	Lecture 23 Various techniques of integration	1.5
	Study of Lecture 23	4
	Problems class 10	1.5
	Time for homework 10	10
week 12		
Calculation of more complicated integrals.	Lecture 24 Advanced techniques of integration.	1.5
	Study of Lecture 24	1.5
Familiarity with tests of improper integrals of the first and second kind.	Lecture 25 Improper integrals. Absolute and conditional convergence. Gamma- and Beta-function. Demonstration of the power of analysis.	1.5
	Study of Lecture 25	4
	Problems class	1.5
	Time for homework 11	10

Learning outcomes	*Educational activities*	*Estimated student work time in hours*
	week 13	
To learn that analysis in more «complicated» spaces can be reduced to the analysis of known spaces.	Lecture 26 Convergence in finite-dimensional Euclidian spaces. Independence of the norm under consideration.	1.5
	Study of Lecture 26	4
Calculations of limits of vector sequence and vector series, inner products, vector products, matrices and determinants.	Lecture 27 Interchange of limits and multilinear maps. Examples.	1.5
	Study of Lecture 27	4
	Problems class 12	1.5
	Preparation for the final.	6
	week 14	
To understand that topology is an axiomatic theory. To decidewhether a set is open or/and closed(or not). To determine the interior and closure of given sets.	Lecture 28 Topology in Euclidian spaces. Open and closed set. Interior and closure of a set. Accumulation points	1.5
	Study of Lecture 28	4
To decide whether a given set is compact or not.	Lecture 29 Properties of open and closed sets. Compact sets. Theorem of Heine-Borel.	1.5
	Study of Lecture 29	4
	Problems class 12	1.5
	Preparation for the final.	6

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Summary calculation of workload:

Week 1 has a workload of 12.5 hours.
Each week 2 - 12 has a workload of 22.5 hours (totally 247.5 hours).
Each of the last 2 weeks has a workload of 18.5 hours.
The sum is 297 hours. Together with the presence time of the test (= 3 hours) we have a workload of 300 hours.

Assessment:

Weekly homework is mandatory, the homework will be corrected each week, and it is necessary to have at least half of correct solutions to be admitted to the final test which lasts three hours. If the students get at least half of the maximum of available points in the final test they get 10 ECTS credits.

Tuning
Tuning Educational Structures in Europe

PLANNING FORM FOR AN EDUCATIONAL MODULE
(Completed by the teacher)

Programme of Studies: Nursing

Name of module/course unit: Clinical studies and nursing *theory* of intensive therapy/critical care

Type of course: Compulsory in some countries

Target group: For nurses who have never worked in intensive / critical care before

Level of module/course unit: First cycle (bachelor)

Number of ECTS credits: 6 (workload is 180 hours; 1 credit = 30 hours)

Competences to be developed:

the abilty to:

1. Recognise the special conditions and the nursing needs of the critical care patients.
2. Respond effectively to the physical, psychological, spiritual and emotional needs of the patient according to level of competence.
3. Explain the common patient /medical problems that usually require intensive/critical care nursing.
4. Can outline, explain and, where appropriate, demonstrate life saving procedures and the recognition of life threatening states.
5. Explain the methods of observation used to monitor critical/intensive care patients.
6. Safely use the monitoring equipement used in the critical care/intensive care environment.
7. Articulate and recognise routine biochemistry and pathology tests.
8. Effectively document care (written and health informatic).
9. Operate as an active member of the interdisciplinary team.
10. Demonstrate effective communication and behavioural skills with patients and family.

In addition there would be practical nursing skills/competences where appropriate. There would be additional ECTS credits for clinical practice and associated assessment. Some illustrative examples are given.The competences here would be expressed under supervision.

Learning outcomes	Educational activities	Estimated student work time in hours	Assessment *(Italics represent clinical assessment where possible)*
Familiarity with the concepts, philosophies and definitions of intensive care/ critical care services. The role of intensive/critical care in the health care service, both in space and time.	Course motivation	1	Class participation
	Lecture: History and development of intensive therapy	1	
	Reading assignment	2	
	Class debate	1	
Learning the personal and objective conditions of the critical care patient's observation, the monitoring methods. Preparing for the clinical field practical training, for the activities needed in ICU, understanding the psychic, epidemiologic and infectologic specialities of IC services.	Lecture: Recording and infection control, epidemiology, mental hygenic relations.	2	Writing case report: all groups Oral presentation of hygienic protocol at an ICU and class discussion *Demonstrates sensitive and holistic care to a patient in ICU*
	Class discussion	1	
	Group work on case studies	1	
	Reading assignment	4	
Accepting the role of homeostasis in order to provide successfull intensive care, undertanding the clinical symptoms of the homeostasis disorders, being able to evaluate the clinical symptoms of disorders in salt,water and acid-base balance of human body. Recognising the importance of the special nursing care concerning the above mentioned diseases and patient problems.	Lecture: Homeostasis and its disorders.	2	Oral presentation and written report : nursing plan (all groups) Use of case studies *Able to recognise normal and abnormal homeostatic results in practice (e.g blood gases, fluid balance).*
	Small-group seminar	4	
	Reading assignment	6	
	Case demonstration	2	

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment (Italics represent clinical assessment where possible)*
Knowing the factors of energetic balance, Understanding its importance from the aspect of health recovery. Knowing the methods of artificial nutrition and the nursing care.	Lecture: Artificial nutrition of critical care patient	2	Written report and oral presentation *Demonstrates safe and effective nursing care of a patient with nutritional support.*
	Case study demonstration	2	
	Reading assignment	4	
Gaining theoretical knowledge and practical experiences about ECG (life-danger formations of ECG curves, differentiating the normal, adequate and pathological curves. Ability to recognise the disrhythms, and their caring. Knowing and understanding the hypertonic crisis, and the acute insufficiency of circulatory system, and its special nursing. Knowing the pathological states leading to acute LCOS	Lecture:Acute cardiac diseases	4	Oral presentation and written nursing report, demonstration on patient simulator *Demonstrates safe and effective nursing care of patients with cardio-vascular or respiratory problems.*
	Patient demonstration	4	
	Lecture: Cardiac patient intensive care nursing	4	
	Class seminar in demonstration room: roleand demonstration on patient simulator	2	
	Reading assignment	10	
Shock. Theoretical and practical aspects of the voluman substitution at critical care patients.	Lecture: Shock. Volumen substitution at critical care patients	4	Oral presentation, written test, nursing report (essay), patient demonstration *Recognises onset of shock, initiates and/or manages therapy effectively.*
	Seminar group: case studies	2	
	Reading assignment	4	

Learning outcomes	*Educational activities*	*Estimated student work time in hours*	*Assessment (Italics represent clinical assessment where possible)*
Overviewing respiratory insufficiencies, and their clinical forms, requiring intensive care service. Understanding the pathophysiological history, the causative relations of the treatment: Conservative methods, ventillator therapy and nursing of patients with pulmonary diseases and ventillator therapy	Lecture: Critical pulmonary diseases	4	Oral presentation, written test, nursing report (essay), patient simulator demonstration *Demonstrates safe and effective care of patients receiving respiratory support.*
	Lecture: Critical care nursing of pulmonary patients	4	
	Lecture: Ventillator therapy, care and nursing	4	
	Small-group seminar: demonstration and case studies, role play with patient simulator	4	
	Reading assignment	12	
Acute kidney insufficiencies: medical and nursing care. Methods for replacing the kidney functions and their nursing.	Lecture: Acute insufficiency of kidnies.	2	Oral presentation, written test, nursing report (essay), patient demonstration *Recognises onset of recovery and deterioration of a patient's renal status.*
	Lecture: Artificial kidney treatment and its nursing	4	
	Small-group seminar: demonstration and case studies, role play	2	
	Reading assignment	6	
The intensive care of the liver diseases and the endocrine dysfunctions. Crisis situations. Medical and nursing care. Being able to provide the coma states with different etiological origin.	Lecture: Acute insufficiency of liver organ and endocrine system	4	Oral presentation, written test, nursing report (essay), patient demonstration Can design, implement and evaluate the nursing care required by a patient with liver problems.
	Lecture: Nursing of patients with liver and endocrine system disorders	4	
	Small-group seminar: demonstration and case studies	2	
	Reading assignment	6	

Learning outcomes	***Educational activities***	***Estimated student work time in hours***	***Assessment (Italics represent clinical assessment where possible)***
Knowing the clinical symptoms of the neurological disorders, their primary care, Understanding their importance from the point of future prognosis. Cerebral oedema, and its care. Stroke service.	Lecture: Neurological intensive care	2	Oral presentation, written test, nursing report (essay), patient simulator demonstration *Can assess a patient's neurological function and determine the nursing response to their specific condition.* Can initiate emergency procedures.
	Lecture: Nursing of neurological critical care patients	2	
	Small-group seminar: demonstration and case studies	2	
	Reading assignment	4	
Sepsis syndrome and multiorgan failure. Understanding the pathological processes, clinical symptoms. Burning, polytrauma as the frequent causative factor of sepsis and MOF. Understanding and knowing the special nursing care of above mentioned patients. Understanding the similarities and differences	Lecture: Clinicum of sepsis and MOF, Burning and Polytrauma	5	Oral presentation, written test, nursing report (essay), patient demonstration *Can assess, design, plan, implement and evaluate care for patients with designated problems*
	Lecture. Nursing of above mentioned patients	5	
	Small-group seminar: demonstration and case studies	3	
	Reading assignment	7	

Learning outcomes	***Educational activities***	***Estimated student work time in hours***	***Assessment (Italics represent clinical assessment where possible)***
Haemostasis disorders in ICU. Clinical and nursing aspects. Special haematological laboratory tests and monitoring of haemostatus at patients with haemotolgic diseases.	Lecture: Critical medical and nursing care of patients with haemostasis diseases	3	Oral presentation, written test, nursing report (essay), patient demonstration *Can recognise signs of haemostatic disorders*
	Small-roup seminar: demonstration and case studies	3	
	Reading assignment	3	
Acute abdomen diseases requiring ICU service: medical and nursing care. Special aspects.	Lecture: Critical medical and nursing care of patients with acute abdomen disorders.	2	Oral presentation, written test, nursing report (essay), patient simulator demonstration *Can assess a patient's abdominal problems.*
	Small-group seminar: video demonstration and case studies, role play	2	
	Reading assignment	4	
Poisoned patients. Toxicology at ICU. Algorhythm of their IC service, symptoms and nursing problems	Lecture: Critical medical and nursing care of patients with toxicosis	2	Oral presentation, written test, nursing report (essay), patient demonstration *Can outline the procedures to be adopted for patients with toxic states.*
	Small-group seminar: video demonstration and case studies, role play	2	
	Reading assignment	2	
Summa		**180** *excludes clinical practice and assessment*	**100 %:** 50 % oral prese ntation, 25 % test, 25 % essay

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Tuning
Tuning Educational Structures in Europe

PLANNING FORM FOR AN EDUCATIONAL MODULE
(Completed by the teacher)

Programme of Studies:	Physics
Name of module/course unit:	Quantum Physics
Type of course (Target group):	1st Cycle Physics students (and potentially engineering students)
Level of the module/course unit:	Introductory (Bachelor level, 3rd year)
Entrance requirements:	Classical mechanics, Electromagnetism
Number of ECTS credits:	8 (workload is 204 hours; 1 credit = 25.5 hours)

Competences to be developed:

1. Capacity for analysis and synthesis.
2. Modelling (subject related competence, see Final Report Pilot Project Phase I, pages 294-297).
3. Problem solving (subject related competence, ibidem).
4. Theoretical understanding (subject related competence, ibidem).
5. Physics culture (subject related competence, ibidem).
6. Ability to solve Schroedinger equations.
7. Composition of angular momenta.
8. Handling the operators formalism.
9. Familiarity with the postulates of quantum mechanics.

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Learning outcomes	Educational activities	Estimated student work time in hours	Assessment
Schroedinger equation	Lectures, Problem Solving (an integrated sequence, 18 L + 14 PS = 32 hrs)	32	written exam
	Private study time	about 65	
Operator Formalism	Lectures, Problem Solving (an integrated sequence, 8L + 5 PS = 13 hrs)	13	oral exam
	Private study time	about 30	
Angular Momentum	Lectures, Problem Solving (an integrated sequence, 7 L + 7 PS = 14hrs)	14	written exam
	Private study time	about 25	
Postulates of Quantum Mechanics	Lectures (synthesis of fundamentals, discussion cases and paradoxes, 5L = 5 hrs, each lecture at the appropriate place in the unit integrated sequence)	5	oral exam
	Private study time	about 20	

The total workload of the student is: **(38 + 26) contact hrs + (65 + 30 + 25 + 20) private study time hrs = 204 hrs.**
This example shows that the private study time varies depending on the educational activity within the unit, ranging from less than 2 hrs per contact hour (Angular momenta) to 4 hrs per contact hour (Postulates).

3.4. APPROACHES TO TEACHING, LEARNING AND ASSESSMENT IN COMPETENCE BASED DEGREE PROGRAMMES

0. **Background**

As part of the second phase of the Tuning project, the subject groups reflected on good practices in teaching, learning and assessment, in particular how teaching, learning activities and assessment can be best organised in order to allow students to reach the intended learning outcomes of a course of study. Biggs (2002) describes this as the «alignment» of teaching, learning activities, and assessment with the intended learning outcomes of a course of study. The subject groups discussed the various approaches which are used or could be used in different subject areas, and provided a structured pan-European disciplinary-based context where an exchange of knowledge about approaches currently used or potential, could take place and where new understanding could be achieved.

1. **Introduction**

One of the key issues in higher education towards the end of the 20th century was the debate about the respective virtues and requirements of traditional academic education and vocational education. Much of the debate took place within universities, particularly in the new context of the knowledge society. Many professions once wholly practiced by persons not holding a university degree saw increased demands for university training. One consequence was the introduction of more professional courses into the university system in some countries, and a greater emphasis on the utility value of university courses in those countries with a binary system. In many EU countries university academics have had to reconcile educational dimensions and professional requirements and manage the tensions that have emerged in trying to achieve this.

A second issue arose from new attitudes to personal rights partly resulting from EU legislation around human rights, freedom of information, data protection and so on. In the new spirit of openness students became much more conscious of what was offered, what was excluded, and what their rights were. This student awareness also brought the awareness that the possession of a university degree does not automatically confer employment —certainly not for life— in a rapidly changing Europe. In some countries employers, too, began to

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make greater demands on universities to describe better what students can actually do on graduation, not just what they know.

One response to these changes was to try and make transparent the relationship between university education and core or transferable skills. The most explicit response was the development of an «outcomes» approach or a competence based model for curriculum development in universities. Two major schools of thought have emerged which can be broadly divided into those approaches which emphasise higher education as a public good, versus those which also lay emphasis on the vocational utility of higher education. Tensions between vocational and public good approaches are to be found not only in Europe, but in the United States. One of the foremost educators in the United States argues that «constructions of outcomes that are embedded within market approaches to education reform legitimize the dominance of "private goods" and undermine the view that public education is an enterprise for the public good in a democratic society» (Cochran-Smith, 2001, p. 50). The Tuning project does not seek to resolve this debate but, nevertheless, wishes to indicate its awareness of it.

A description of the long and complex development of changes in university education across Europe, particularly on the issues that have influenced curricular change, is beyond the scope of this chapter.

Europe requires its people to be culturally and intellectually equipped in ways appropriate both for their present and for their future. Only thus will they be able to lead meaningful and satisfying lives, personally and collectively. Institutions of higher education have a key role in developing appropriate strategies. It is the responsibility of higher education institutions to prepare their students, in a life long learning perspective, for a productive career and for citizenship. Universities and other higher education institutions increasingly have come to realise that theirs is a moving target, and that their leadership in the field of the elaboration and transmission of knowledge and understanding implies a new sensitivity towards developments in society. They increasingly look to consultation with their stakeholders on a regular basis. Education inspires progress in society, but at the same time it must respond, with foresight, to society, preparing adequate strategies for future programmes of studies.

The Tuning project's approach to setting up degree programmes and ensuring quality in their design and implementation combines both aspects. In phase I of the Tuning project the emphasis was on the process of consultation with «actors» or «stakeholders», the definition of academic and professional profiles and the translation of these into desired learning outcomes. Tuning identified indicative generic competences or transferable skills and described the then commonly used subject-specific competences in terms of knowledge, skills and understanding for nine subject areas. Tuning II has turned to the next step looking at how to implement competences, defined on the bases of identified requirements of society and foreseen social developments besides scientific developments in the subject area concerned, in terms of approaches to teaching, learning, and assessment.

2. **The Tuning approach**

In the Tuning project the decision was taken to make a distinction between generic competences (transferable skills) and subject-related ones, although it is accepted that key outcomes of university programmes will be subject related competences. Tuning I showed that an indicative sample of employers, graduates and academic staff were in broad agreement about which generic competences, from a range offered in a questionnaire survey, are the more relevant ones, although they differed slightly with respect to the order of importance of some of them.

The importance of these generic competences is now widely understood, but understanding of the concept alone is insufficient. The true importance lies in the implications a competence-based approach has for teaching and learning. In other words, which appropriate modes of teaching, which learning activities might best foster competences in terms of knowledge, understanding and skills; and how do we assess these competences.

3. **Definitions**

One of the problems the Tuning members encountered in discussing approaches to teaching, learning and assessment on a European-wide scale was that every country, and even institution, has its own peculiarities and features deeply grounded in its national and regional culture. Each has its own written and unwritten rules about how to prepare students best for society. On commencement of a mapping exercise on the approaches currently in use or planned in different national systems or individual universities, it became clear that each has developed its own mix of techniques and kinds of learning environments, all of which are well founded, but which need to be mutually understood. It may be the case that the same name is given to different methods (e.g. «seminar», «lecture», «tutorial») or, conversely, different names correspond to similar activities. Tuning has seen it as one of its tasks to create more clarity with regard to the issue of definitions and their understanding in practice. A comprehensive list of terms and their translations into to all European languages is being developed and this glossary will be published on the Tuning website at the end of 2005.

A wide range of teaching techniques is used in universities. The set of teaching techniques strongly depends on the instructional form of education (face to face education, education by correspondence or distance education). Apart from the ubiquitous lecture, the consultation revealed the following list (which is far from exhaustive):

- Seminar (small group teaching).
- Tutorials.
- Research seminar.
- Exercise classes or courses.
- Workshops (classroom based practical classes).
- Problem-solving sessions.
- Laboratory teaching.
- Demonstration classes.
- Placement (internship/traineeship).
- Work based practice.
- Fieldwork.
- Online / Distance or e-learning: which may be paper based or ICT based.

Such lists are indicative only, and are really a list of categories of teaching activity, since how each is undertaken may vary widely not only between academics but within the everyday practice of any one academic, depending on the focus of the teaching and the intended learning outcomes for the students. The lecture itself can vary immensely in format and function. At one extreme it can be a turgid reading aloud of the lecturer's notes with students frantically trying to replicate these in their notebooks (the «tops of your heads» approach to lecturing, since all that can be seen are the tops of the heads of lecturer and students). At another extreme, the students will have read the notes before the lecture on the intranet, and will participate in a presentation that fleshes out the notes supplemented by interesting examples provided by both lecturer and possibly also by students from their reading. The scope or function can also be quite different. A lecture introducing a new topic may provide an overview so that students can quickly become aware of who are the key players in this

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aspect of a field, how it has developed, and where current concerns are focussed. But not all lectures deal with broad scopes: one might, for example, use a lecture to fully explicate some key but complex concept, engaging students in some small group or individual problems at different points. Thus it is with all of the teaching techniques. The mere label is handy, but it does not tell exactly what the lecturer does.

One way of gaining some insights into the teaching techniques used is to look at what learning activities students are also required to do in a programme or part of a programme of study. As with teaching, learning activities called by the same name can differ quite widely. Apart from attending lectures (participating in lectures) or reading books and journals, the following (inevitably partial) list of commonly used learning activities gives some idea of the richness that is possible in aligned teaching and learning.

- —Conduct searches for relevant materials in libraries and on-line.
- —Survey literature.
- —Summarize those readings which seem to be most relevant to their current needs.
- —Learn to pose problems as well as solve those set by the lecturer.
- —Conduct increasingly complex even if small scale, research.
- —Practise technical or laboratory skills.
- —Practice professional skills (e.g. in Nursing, Medicine, Teaching).
- —Research and write papers, reports, dissertations of increasing difficulty (in terms of size and complexity of the material).
- —Work with other students to co-produce a report/design/answer to a problem.
- —Prepare and make oral presentations, either in groups or individually.
- —Make constructive criticism of the work and others, and use the criticism of others productively.
- —Chair and participate usefully in meetings (of seminar groups, for example).
- —Lead or be useful members of teams.
- —Work under time constraint to meet deadlines.
- —Communicate questions and findings with others using a variety of media.
- —Learn to criticize their own work.

To complete the cycle of learning one must also look at how students' achievement of learning outcomes is assessed. Assessment is not just the rounding off of the teaching and learning period but to a large extent a central steering element in those processes, and directly linked to learning outcomes. At one time, in some countries the oral examination was the most used method of assessment, while in others it was the essay. In a number of countries even today the essay remains a commonly used mode(s) of assessment. There is nothing wrong with essays as such, as long as the task set is appropriate to the unit of study and to its intended learning outcomes, and the lecturer has the time to mark them promptly and provide written feedback which is constructive and focussed. Nevertheless, the long written paper is only one of the options that the busy lecturer has at his or her disposal, and the main competence assessed is the ability to research and write such papers in the appropriate genre: useful academic skills, but not the only ones students need to develop and demonstrate the ability to perform.

Most programmes described in Tuning use a range of modes of assessment at different points in the programme. Coursework assignments, which may be formally assessed and graded —or not— assess student performance as the programme or part of it progresses. These may include the following, but again this is not an exhaustive list, merely that which arose from the Tuning work.

- Tests of knowledge or skill.
- Oral presentations.
- Laboratory reports.
- Analyses, e.g. of texts, data.
- Performance of skills while being observed e.g. in work placements, laboratories.
- Work placement reports or diaries.
- Professional portfolios.
- Fieldwork reports.
- Written essays or reports or parts of these, e.g. a written review of relevant literature; a critique of contrasting research papers

Central to all of these ways of assessing student work *during* a programme is feedback. The assessment is said to be *formative*, because the students learn by doing the work and then having the lecturer comment on how well they have achieved it, where they have done less well, how to improve, and what steps might be taken to do this. To further enable students to achieve the task successfully it is increasingly the case that students are given the criteria for success at the outset: a specification of what they have to do in order to complete the task satisfactorily.

Of course, in any programme of study, or parts of it, there is a need for *summative* assessment. Sometimes the coursework discussed above performs both a formative and a summative function. The grade given is the summation of the student's achievement in that element, and the feedback from lecturer —and sometimes peers as well— is the formative part.

Traditionally, however, and still commonly used for a variety of reasons, there are some forms of assessment which are usually only summative: they assess achievement at the end of a programme or part of it, and students may receive only their mark or grade (which does have its formative aspect!) rather than feedback from the lecturer. If the examination has a follow-up seminar or tutorial to discuss the results it then contains a greater amount of the formative function.

Some form of invigilated examination is the usual format for summative assessment; this may be written or oral. Written examinations have the virtue of cheapness and security: a large cohort can be examined at the same time, while oral examinations can probe a student's learning in ways that a written format normally does not allow.

Written examinations can take a wide range of formats, including the following short list of common ones:

- Essays.
- Multiple choice questions.
- Problems to solve (e.g. in mathematics, physics, linguistics among others).
- Analyses of cases/data/texts.
- Literature reviews e.g. based on memory, or open book or takeaway procedure.

Oral examinations can also have a wide range of formats, within the following two categories:

- Oral questioning by (usually) more than one lecturer.
- Demonstration of a practical skill/ set of skills.

It goes without saying that almost any form of assessment can have a diagnostic function for both student and lecturer. By seeing what has *not* been achieved, what has been achieved with little effort, what is excellent, and so on, both the teacher and the learner know where more work is needed or where effort can be diverted.

So far, the project based dissertation or thesis has not been mentioned. This is an example of a complex mode of assessment, widely used across Europe in every subject area, and in all degree cycles in varying levels of complexity, and with different purposes at each level. The thesis is a summative assessment of a programme or substantial part of a programme, demanding the demonstration of a range of competences and understanding. It is also strongly formative in that it is normally prepared under the supervision of a lecturer, who advises the student on the work, and certainly provides feedback at different stages of its development. The summative examination may be oral or written i.e. based on the text. At doctoral level the final examination of the thesis is always by an oral examination (the defence of the thesis), although the format of this may vary quite widely from country to country, but in the lower two cycles assessment of projects and dissertations may be based on the student's written document alone.

In many institutions guidelines and requirements have been developed for the assessment of learning at different programme levels, as well as for preparing final theses. In particular, it is becoming the norm to publish the criteria for success in assignments, something which should be universal. Many Tuning members reported that their departments were instituting procedures for fair assessment. European wide guidelines[24] are now emerging, which say, for example,

> «Student assessment procedures are expected to:
>
> — Be designed to measure the achievement of the intended learning outcomes and other programme objectives;
> — Be appropriate for their purpose, whether diagnostic, formative of summative;
> — Have clear and published criteria for marking;
> — Be undertaken by people who understand the role of assessment in the progression of students towards the achievement of the knowledge and skills associated with their intended qualification;
> — Where possible, not rely on the judgements of single examiners;»

Finally, when discussing assessment issues across different cultures, it is important to probe the different ideas about what should be taken into account in assessment vary. For example some systems prize hard work, others high achievement, others high potential. This underlying value system is easily forgotten in a straightforward description of what modes of assessment are used, but in a «mobile Europe» is one which should be better understood.

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[24] Standards and Guidelines for Quality Assurance in the European Higher Education Area §1.3
http://www.bologna-bergen2005.no/Docs/00-Main_doc/050221_ENQA_report.pdf

4. **The Tuning II consultation**

To obtain a better overview of possible learning, teaching and assessment strategies based on a learning outcomes / competence approach, Tuning II organized an extended consultation among its members. Each academic involved in the project was asked to reflect on a given number of subject-specific and generic competences and to identify ideas and best practices to develop these competences in a degree programme in terms of learning activities, teaching, and assessment. They were asked to find answers to the following five questions:

1. What does this competence mean for your students?
2. How do you help students to achieve this competence in your teaching methods?
3. What learning activities do your students engage with in order to develop this competence?
4. How do you assess whether, or to what degree, they have achieved this competence?
5. How do your students know whether or to what degree they have achieved this competence, and if not, why they have not achieved it?

Tuning members followed different strategies to find reliable answers, including consultation with colleagues in their home institutions. Most subject groups identified possible strategies either based on ideas or real experience. While some reported actual practices, others described how current good practices could be linked to new concepts of competences, and so reported on future possibilities rather than on present practice.

Across Europe, it is clear that there are two main ways of teaching or enhancing generic competences. The first is the provision, as part of a degree programme, of separate course units / modules to enable students to master at least part of the generic competences. In this respect one could think of, for example, academic writing and oral skills and ICT-competences. The second way is for generic competences to be developed as part of or integrated into subject programmes and modules. Through the consultation process it became clear that it is possible to foster generic competences while teaching normal subject area material if there is awareness of the need to do so and if teaching strategies are designed taking generic competences into account. In general, since different approaches to learning, teaching and assessment tend to form or enhance different generic competences,

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Tuning members underlined the requirement that each student experience a variety of methods.

5. **The consultation process on generic competences**

On the basis of the materials prepared and presented by the different subject area groups in Tuning, an overview is offered of how certain specified generic competences are perceived, what teaching/learning methods are or could be used to encourage their development, and how they are assessed. Further aims are to see how they are perceived by (or, possibly, what their importance is for) students and to investigate whether there are teaching learning methods used in some disciplinary areas, or in some countries or in some institutions which can usefully be proposed as models of good practice or which can be of interest more generally in developing new insights into competence-based curriculum design and delivery.

It is striking to see how differently some generic competences have been understood in the context of the various subject area groups. Sometimes strong differences can be noted between different national traditions within a single subject area; however it is more common to observe strong differences in perception and methods between different subject areas.

It seems clear from an examination of the answers gathered that generic competences are always interpreted in the light of the disciplinary area. Even in cases in which the graduates or a relevant number of them will almost certainly be expected to work in areas not directly related to the subject in which they will receive a degree, the academics' perception of the generic competences remains quite tightly tied to the subject area disciplines themselves.

The first consequence of this observation is that in practice the generic competences do not appear to be rigidly separate from the subject specific competences. Rather they appear as further variations to be considered within the range of the subject specific competences. An additional consequence is that for each generic competence a distinction must be made between disciplinary areas in which the competence is considered important or even fundamental, a priority for the discipline, and those in which its connection with the subject area is less clear.

The consultation focussed on a selection of the thirty generic competences identified by the Tuning project. From these eight were selected for discussion in this paper:

1. Capacity for analyses and synthesis.
2. Capacity for applying knowledge in practice.
3. Basic general knowledge in the field of study.
4. Information management skills.
5. Interpersonal skills.
6. Ability to work autonomously.
7. Elementary computer skills.
8. Research skills.

Capacity for analysis and synthesis

No clear-cut definition of the capacity emerged from the consultation but it was evident that the Subject Area Groups (SAGs) defined analysis and synthesis in a very wide sense. The Business Studies SAG listed among others the elements of identifying the right research question or problem, the ability to describe as well as to conclude and formulate recommendations as indicators. The Education SAG also took into account the reflective ability of a student and the ways in which this demonstrates the capacity for description, analysis and synthesis. The Mathematics group highlighted that a student should use her/his analytical competences when confronted with a problem, and think whether they could relate this to one they have faced before. If this is the case they should «find out whether the same hypotheses holds water» so that previously achieved results can directly be applied. If not, students should find out what they could use from past experience and start there to develop new approaches to solving the problem. In this context a student would enrich her/his synthesis competence by extracting the key points from their solution, so that they can be presented in a clear, concise and nevertheless complete form.

Other SAGs defined analysis in a way which seems to comprise all these indicators as activities, i.e. this generic competence enables the student to understand, evaluate und assess information which has to be collected, interpreted and the main issues identified. It demands logical thinking, using the key assumptions of the relevant subject area and even the development of this area further by research. In no SAG was the acquisition of this skill taught in a separate element or module, i.e. this generic competence is embedded in any subject, in any module of teaching and learning.

This view was also supported by the perceptions of students. Data collected from students showed that they attached great importance to this competence as it enabled them to relate theory and practice, evaluate findings logically and use instruments to find out alternative ways; they perceived it as being highly pertinent to their future professional career.

For the description of the competence a large number of expressions were used: to interpret, to find the main points, to understand, to evaluate, to deal with information, to evaluate critically, to marry theory and practice, to organise information, to understand, to place in context, to develop objectivity, to combine, to research, to formulate, not just reproduce, to apply, to describe, to conclude, to think, to compare, to select, to differentiate, to contrast, to break down, to summarise, to argue, to relate, to generalise, to think logically, to think rationally, to appreciate, to consider, to predict, to provide, to solve. This wide definition is essential as it relates directly to the teaching and learning activities which enable students to achieve this competence. It is highlighted that the competence is directly related to the ability to solve problems, another highly ranked generic competence.

It was reported that students develop the capacity for analysis and synthesis through:

- formulating ideas of a concept as a result of the reading, researching, discussing and brainstorming in highly specific, subject-focused work, either academically and professionally oriented;
- learning to describe objectively, categorize, relate categories;
- making independent autonomous interpretations, evaluations, distinctions and differentiation and sharing insights from learning through debates, theses;
- becoming aware of their own, and challenging others', taken-for-granted assumptions;
- revealing links between contemporary concepts;
- quantifying information;
- applying relevant theory to source material;
- incorporating new conclusions into existing knowledge;
- placing specific events and/or problems into wider contexts;
- giving proof and / or counterexamples.

Assessment of the extent to which this competence has been achieved varies according to the way in which it has been developed. In some SAGs this was done partly through group meetings and discussion sessions. The assessment can also be based on how students analysed material or information. In the Education SAG a variety of modes of assessment were identified: discussion, questioning, observation, evidence of personal and professional engagement, supervision of reports, active participation in placements, essays, assignments, projects, examinations, theses.

Students may also contribute to their assessment by submitting or presenting a «self-evaluation» at the end of the semester. Feedback is organised through group discussions or individually, whether in writing or face-to-face.

SAGs also highlight that *students* identified a number of ways by which they would know if they had achieved this competence, such as

- —feeling more competent and confident to put forward an opinion;
- —being able to relate research findings to theory and / or their own circumstances;
- —having no problems in writing essays and reports on findings from reading and research;
- —feeling free and able to criticise or critically evaluate presentations, reports etc. of others;
- —feeling more comfortable in receiving criticism themselves.

Capacity for applying knowledge in practice

In some cases this competence is described in more general terms, such as «facing concrete problems by using basic concepts». In most cases, however, it is described as the ability to perform specific academic tasks, which may vary according to the discipline. In initial teacher education there is a clear projection into the future teaching profession. In the second cycle this competence is often described in more professional terms, and may be more closely associated with activities to be performed in the workplace such as collecting information from diverse sources and writing a report on a complex issue.

The different teaching methods used to help the students achieve this competence reflect different approaches to practice. Accordingly, the opportunities for practice provided inside and outside the institution are described differently in the various disciplines, as exercises of various types, practical classes, lecture sessions, seminars, field classes, laboratory sessions, industrial projects, industrial placements, study visits, field excursions, student teaching practice. Some disciplines suggest that this competence can be best developed by doing a project or writing a thesis. Others, like Business Studies, Chemistry, Mathematics and Education emphasise the need to provide appropriate tools and methods as well as opportunities for problem solving. The Education group emphasises the importance of reflection on work done. Earth

Science (Geology) reported the centrality of this competence to the development of subject knowledge.

Sometimes the learning activities intended to develop this competence are carried out in connection with the world of work. In Business Studies, reference is made to course related tasks/reports carried out with mentor/sponsor companies, to theses based on actual problems from companies or organisations and to guest lecturers. In Physics, Chemistry, Business Studies (among other subjects) final year projects can be carried out (partially or totally) in an industrial environment, and in Nursing and Education there is a substantial practical component. Learning activities for this competence may also be carried out within the academic learning environment, performed by whole classes, small groups and individual students.

It is traditional in Earth Science to have students undertake a mapping thesis involving some six weeks applying their knowledge in the field working either autonomously or in a small group, usually with limited supervision. The resultant report on this independent work can comprise a significant component of the final exam and is considered extremely important by employers.

Continuous assessment of progress is based on seminars, exercises of increasing complexity, laboratory work, short oral presentations, teaching practice, assignments, regular meetings with the teacher for evaluation and feedback on the project. For some courses, only a part of the marks are given for coursework, in other cases coursework completely replaces the traditional examination. This may be particularly true in the second cycle. Final exams can be written and oral tests including practical problems/questions, or proficiency tests in class or laboratories regarding practical problems. This competence *can* be assessed through the essay format provided that the task set is clear and well constructed. A three part model for a task might include a requirement to outline the theoretical bases of the issue; a requirement to outline relevant issues to do with implementation in practice; and illustrations of how this is done, or would be done, in the working context of the candidate. A simple statement of the topic, with the laconic instruction «Discuss» would not probe how far this competence had been developed. It would not examine content knowledge very efficiently, since the topic would be too large to deal with, and there might even be a danger of plagiarism, or at least over reliance on the source materials).

Generally students understand whether or to what degree they have achieved this competence from the feedback they get from the teachers, either on progress made during the course or on their final products and exams.

Basic general knowledge in the field of study

This general competence is the one most obviously linked to the single subject areas. In fact, since it has been designated clearly as basic general knowledge «in the field of study», it seems clear that this was not intended really as a generic competence at all, but rather as a basic level of subject specific knowledge. Hence in the abstract one might expect that the ways of forming this competence would be different for each area, tightly linked to the specificities of the subject. In practice this is not entirely the case. Basic general knowledge is perceived as having three aspects: the first, the basic *facts*; and second the basic *attitude* considered specific to the subject area. The third aspect is constituted by *related* or necessary *general knowledge* which is not strictly subject specific: e.g. knowledge of maths or a foreign language for physicists and of history and politics for education students. Little space is given in the reports to considering whether the basic general knowledge of the subject at first cycle level might in some cases and to some degree be acquired in school or previous to the higher education experience, and hence be assessed at entry and integrated or completed during the higher education experience in a selective way. Normally for first cycle study universities are very familiar with the school curriculum and have a good idea of what is covered, particularly in the pre-university period. However, in Physics, the subject area group states that the maths knowledge and capabilities obtained in upper school are evaluated at entry in higher education. Another exception is Education, where mature students wishing to enter a teacher education programme may present a portfolio of evidence to show that their qualifications both formal and non-formal are appropriate for entry. This approach, known as Accredited Prior Experiential Learning, is used across Europe.

Basic general knowledge for most subject areas is learned through lectures, reading, discussions, library and Internet searches and assessment through written or oral examination. Discussion of papers, exam results or discussion during the oral examination is thought to make students aware of whether their basic general subject knowledge is adequate. Great effort does not seem to be put into thought and reflection about this aspect of learning; it is accepted by all concerned as necessary, largely a matter of factual and conceptual knowledge. Naturally the pan-European context of Tuning shows that in some subject areas the content of this basic general subject knowledge varies quite radically from country to country, although in others there seems to be relatively little difference. However, in most subject areas there is general agreement about the *core* subject knowledge of first cycle degrees.

It is more complicated to develop or foster the other component of basic general knowledge, the mindset of the discipline, its values, and its methodological or even ethical base. However here a number of strategies were mentioned by the SAGs. Some aspects (rigour of analysis, ethical values and intellectual standards) are discussed in lecture courses, and presumably are criteria for success in assignments. The objective in this case is to tell students what the standards and the values of the subject area are. Students also acquire the mindset of the subject area through their reading, where they constantly see models of how their subject community thinks; they will also gradually see how the different schools within the subject community think and what their attitudes are. In the subject areas that have discussed this general competence, we find that the mindset or attitude, intellectual and ethical values considered fundamental to the subject are also thought to be encouraged by hands-on learning experiences, such as laboratory work in physics or experience in analysis of historical documents in history, preparation of oral presentations, reports and posters in education.

Information management skills (ability to retrieve and analyse information from different sources)

This competence is fairly uniformly understood to mean knowing how to find information in the literature, how to distinguish between primary and secondary sources or literature, how to use the library —in a traditional way or electronically— how to find information on the Internet. One subject area, history, devotes much specific attention to the various kinds of sources of information and techniques for accessing them and interpreting them (indicating archival documents, papyrus, archaeological materials, secondary sources, oral history and so forth) as well as to the more usual kinds of information listed by the other subject areas. In this particular subject area a variety of activities, lectures, workshops, site visits, group and individual work including final research dissertations are seen as connected to this general competence.

In all subject areas there are specific teaching-learning activities devoted to learning library skills. Some of these activities may organised in conjunction with the library staff and have the form of visits to the library or library workshops. Retrieval of information from the Internet and its critical evaluation may be demonstrated in a lecture context with multi-medial support, followed by assignments of student tasks and evaluation of the results. Information retrieval skills are seen as progressive: in one report it is mentioned that in the beginning of the higher education experience students are encouraged to use reference books to supplement the information they receive from lectures, whereas by the time students complete their studies, they should have brought their library and other information retrieval skills up to research level.

In all subject areas, the central activities seen as conducive to this competence are those in which the experimental or research component of the subject is being developed, in order to see whether the student is able effectively to use the library or whatever other appropriate sources of information to supplement his/her individual work. For example, in chemistry, as the student works in the laboratory, he/she may have to have recourse to the literature (on different levels according to the level of study) in order to interpret the laboratory results or to guide in the design of laboratory analyses. In history, the student is required to read and analyse documents of various kinds and to contextualise them using the bibliography and published sources. Such exercises will be more or less elaborate and more or less original according to level of study. In earth science students are asked to organise presentations, written or oral, of the material collected and to show that they have interpreted it properly using the relevant literature.

Feedback on students' efforts is perceived as particularly important for this competence, and is in the form of written or oral comments on student work. On the basis of the reports it seems that the subject areas have a clear perception of the importance of this competence and that it is developed and assessed —to varying degrees of complexity and characteristics that are determined by the subject area— in all disciplinary studies.

Interpersonal skills

This competence is seen as central to three subject areas, Education, Nursing and Business Studies, all of which in one way or another provide specific activities to develop what is perceived as an important competence for the subject area as well as an important general competence. For the other subject areas, this competence is perceived as useful or necessary for survival, citizenship and employment, but not subject related —and according to some reports not even very important.

In Business Studies the means mentioned for developing these skills are group work, presentations, specific lectures, training-coaching course. A specific kind of activity is a computer-based Business Studies game in which groups of students must act out realistic business scenarios, working in groups and dealing with issues of group dynamics, time management, decision making and so forth. Nonetheless, it is stated that except for the actual performance in such activities, there is little knowledge of how to evaluate and assess interpersonal skills and that this competence needs further work.

In Education and Nursing, the interpersonal skills cluster of competences is at the centre of reflection. In fact, in a very meaningful sense, for many graduates of Education and Nursing their work is an entirely interpersonal activity. In Nursing particular communication aspects are key skills, such as presencing, observation, listening, asking questions, non-verbal communication, ability to have conversations with different groups of interlocutors, leading and participating in meetings. These skills are often contextualized in written practices, including, for example, preparing written health promotion materials for different audiences.

In Education, there also is a great awareness of the different aspects that this competence has. Interpersonal skills are defined as including not only the ability to work in a group, to present one's projects effectively and possibly to develop leadership skills —here emphasis is placed on the dialogic nature of interpersonal skills and of the teaching-learning process. Aspects considered are, very significantly, «listening» (not mentioned by any other group except Nursing), verbal and non-verbal communication, ability to guide discussion groups or to work in them; to deal in a civilised way with people from a wide variety of backgrounds; to conduct interviews; to create interactive teaching and learning environments. SAGs noted that students should be and will inevitably be in possession of many interpersonal skills when they start higher education; however the considerations of the Education and Nursing groups underline that the higher education experience must add substantially to those competences, and must indeed give a whole new cast to them. This will not surprise given the importance of interpersonal abilities for those fields

The ways in which such competences can be developed start from making students aware of the fact that they have much to learn in this field, i.e. with encouraging a self-critical evaluation of their existing knowledge and behaviour patterns. Another important aspect is for the student to find out whether what they believe they said was understood that way by others. An aim of these activities is to develop awareness and confidence in their interpersonal know-how in the students. There is also a more «knowledge based» aspect to the development of interpersonal skills which is the subject of reading and research as learning activities. All the competences developed are put into play in practice when the students actually enter the workplace in a training setting. Students in this case will observe role models in action and analyse what they see and hear; students also keep a personal diary or log of their experiences and observations.

Results can be assessed fairly effectively in the context of the activities mentioned. Some teachers consulted by the Education group were sceptical about whether these skills could really be taught and learned formally or accurately assessed. However, most teacher education programmes make use of competence-based assessment procedures to assess the classroom practice elements of courses. These include formal assessment of the students' competence in interpersonal areas such as questioning, classroom management, teacher-pupil relations, and teamwork with colleagues and so on. The strategies outlined certainly have the merit of creating an environment in which interpersonal skills can be explicitly considered and their development targeted.

It is stated that students are aware of whether they have been successful in acquiring the appropriate interpersonal skills when they feel confident in groups and in their practice teaching. This feeling of confidence may be of varying value in different countries as an indication of successful achievement. The perception and feedback of others, particularly learners, would seem to be more significant. The importance and range of communication skills for Nurses is made explicit in programme outlines and assessment procedures.

Overall, on the basis of the reports available, it appears that interpersonal skills may not be taken sufficiently into consideration by higher education academics, with the exception of those in whose subject area those competences or skills are thought to be fundamental. This is not surprising, considering that interpersonal skills are perhaps exactly the kind of competence that traditional university education ignored and which nonetheless are of great importance in the educational process. It was assumed that students would «pick up» appropriate interpersonal skills as they progressed to maturity. This may be the case in wholly mono-cultural contexts, but how many of those are there in 21st century Europe, or, indeed, 21st century anywhere? It is not proposed here that all subject areas imitate the Education, Nursing and Business Studies SAGs in the emphasis given to this group of skills and competences, nor that the same teaching and learning strategies be used. However, students in all subject areas would benefit if programmes were to address more explicit, analytical and practical attention to this group of competences because there is no doubt that whatever employment a graduate will find, these skills will be of use to them. Hence a useful direction of endeavour to educate the educators could be to develop awareness, both in our capacity as teachers and as learners, of this group of skills.

Ability to work autonomously

The ability to work autonomously is prized in all subject areas. Naturally in real life —post graduation— the ability to organise available time, choose priorities, work to deadlines and deliver what has been agreed on, is essential for personal and professional life and citizenship in general. At present, the main methods reported of developing this competence in students are, in the initial stages of higher education, to ask the students to use methods other than lectures (e.g. library, field work) to learn to work autonomously; and in the final stages of the course of study, to give the student a great deal of autonomy. Some recommendations are made not to harass students with many small deadlines, or to give constant reminders of deadlines, letting the students learn to organise their time by having to do it. The final paper or dissertation is seen as a particularly useful means of ascertaining whether the student has learned to use time and organise complex tasks effectively.

Experience shows that national traditions are very different in the attitudes and practices with regard to student autonomy. In some countries, particularly where students are more mature when they start their studies, they are considered to be adults from the very beginning, attendance is not mandatory and deadlines are quite flexible, going to the point of giving students the opportunity of staking all on a final exam —for a course, for a year, or even for an entire course of study. The other extreme is based on a closely structured course organisation in which students are given specific study tasks which are checked during the semester (writing papers, or reading and studying certain material on which the student is tested) according to a strict time schedule, often coordinated with other time schedules in the department or Faculty to avoid overlap. In this case the basic strategy is to insist on the student having accomplished the task on time, in a context perhaps reminiscent of school organisation, but perhaps without the leeway permitted in school. It is interesting to see, in fact, that for some the ability to work autonomously can be developed by a sink or swim strategy, whereas for others, it can be accomplished by enforcing and insisting on the respect of a framework of task organisation decided by the teacher.

Elementary Computer Skills

As part of formal programmes of study in most subject disciplines students are required to be appropriately skilful in aspects of computing and information technology.

Within programmes of study in different subject disciplines this competence may be seen as one or more of

- —a competence designed to support current study of the discipline,
- —a competence to enhance future employability,
- —a competence to enhance lifelong learning.

Under each of these the content, emphasis and weight within the curriculum will vary considerably with the subject discipline. At one extreme, it may be assumed that students have the necessary competence on entry to the programme or that they will informally acquire necessary competences as they progress through their studies. This is likely to be the case where computer skills are seen only as a relatively elementary skill, both in terms of supporting study and enhancing future employability.

Not all SAGs focussed on this competence in the consultation, even though their subject is one were computer applications are very widely used, e.g. Mathematics. Those SAGs which did address this competence emphasised that the objective is that the student feel confident to approach and use a computer for any type of activity required by the subject curriculum. Detailed responses reported the need for students to be able to create and store information on any media, e-mail, search on the web, and specifically have experience in data logging of experimental apparatus to a computer and processing of the resulting data, use subject specific software (Chemistry). Word processing or special software to present in words or graphics (plotting) or calculate, evaluate and access information wherever it is available (Physics).

Students are also increasingly asked to become familiar with learning spaces to make use of new forms of e-learning via facilities such as the use of communications networks and new educational technologies. Modern e-learning management systems usually use special facilities such as virtual learning environments (e.g. WebCT, Blackboard), newsrooms, direct web-links (Education).

The competence is also a requirement for writing papers such as theses, dissertations in an adequate format, fulfilling all academic standards in terms as footnotes, literature and source review (History).

Students receive both, formal lectures and the opportunity to apply their knowledge in computer laboratories to develop their computer competences. Some SAGs report the initial provision of free access sessions after which specifically subject oriented instruction is given. Others perform an audit of the students´ skills at the commencement of the course and their subsequent ICT development will be self-selected with personal tutor help (Education). Formal lessons are sometimes scheduled much later in the programme (2nd or 3rd year), when specific software is being introduced. However, most of the time, basic courses are provided at the beginning of programmes by the institutions, sometimes in the format of an intensive short programme.

Web evaluation is also considered an important way of developing computing skills in a wider sense. Typically such teaching and learning sessions would start with a class-based task using an on-line site and generate student criteria for evaluation which are discussed and categorised. Some lecturers then steer students towards finding other evaluation sites as part of web search skills, others give out lecturer-selected criteria. These evaluation criteria will be tested by referring to identified web-sites.

According to the Education group[25], forms of teaching and learning to develop the computer competences of students include:

- —self access programmes of self learning;
- —voluntarily attending taught elements linked to the various skills, graphics, web evaluation, etc. as outlined above;
- —modelling good practice, e.g. by giving URL references for students to follow up, by providing examples of good presentations etc.;
- —requiring the production of student work in various appropriate formats, often with links being established to resources available on-line;
- —asking students to find literature in various libraries via computer;
- —communicating information about the programme organization in an electronic format only, e.g. by intranet;
- —applying quality criteria to web-sites.

Assessment of developing computer skills is based on requiring students to demonstrate evidence of the competence e.g. by asking the students to write a presentation for interactive classes using various computer software applications (Business Studies). In Education all activities for early development of ICT skills focus on skills development rather than knowledge or awareness. These include that students

[25] On the web (http://www.ltss.bristol.ac.uk/anorak/) a staff audit questionnaire can be found —and similar ones are available for students, too, both in electronic and paper format.

- —be given a task for which some missing information is available on a lecturer-made database —or they have to develop an adequate database for some given information;
- —see a presentation of the «skill» and then are set a task to apply it themselves;
- —have to use browsers or search engines to deliver required information;
- —have to present papers and to be assessed on the computer based competences in the delivery.

Where skills are assessed, students are informed about their achievements by grades and oral feed-back. Reference is made to all tasks students had to perform, covering demonstrations in supervised computer laboratory sessions, assigned computer based tasks, practical laboratory reports on experiments and even the final year project report (e.g. Bachelor thesis). In Education there is also the comparison made with the acquired competences at the end of a study-programme with the results of a self-evaluation audit in case the student had to do it at the start of her/his university programme.

When describing this competence SAGs use the following verbs: to feel confident in approaching, to create, to store, to make familiar with, to search, to draw, to use, to match, to enter, to produce, to save, to alter, to cut and paste, to format, to link, to conduct, to assist, to illustrate, to evaluate, to generate, to communicate, to browse, to interact, etc.

One group for whom computer use may be problematic are mature students entering university for the first time. Schools nowadays teach computer skills, and both soft- and hardware have changed out of all recognition in the past 10 years. Mature students may not, however, be computer literate, and may not feel confident enough to ask for help.

Research skills

All SAGs agreed about the importance of research skills especially, but not only, for the second cycle. However some differences emerged in the meanings attached to this in the various disciplines. While Education and History emphasise knowledge of different research methods, Physics focuses on knowledge of the techniques used in a particular research field and Chemistry also refers to designing specific projects and evaluating their results.

No clear distinction was stated between learning how to do research with the help of a teacher and learning how to do research through the activities related to a personal research project; yet in scrutinizing programme descriptions collected, it was quite clear in Education and Nursing, at least, that specific units addressed the development of research knowledge and skills, especially in the second cycle. This is in addition to the integrated evidence based teaching that Educationists and Nursing specialists espouse. Since research competence is developed by following these two parallel paths, (in addition to continual exposure to research through reading research reports as part of programme requirements), it is sometimes difficult to draw a clear line between the teacher's role and the learners activities: The lecturer's contribution would mainly consist in presenting methodological approaches, creating an awareness of the research context, i.e. the social, biographical, and cultural background of all participants in a research project, providing input and setting up activities for the learner, who will perform these activities and will regularly get back to the teacher for advice, further input and feedback on the work done. Lecturers set up research methods courses/seminars or practical reading/writing workshops; create exercises where students conduct qualitative and quantitative data collection and practice modes of analysis, provide bibliographical materials and documents, and encourage further literature searches and links to materials already studied as part of other elements in a programme; continue to guide the reading and critical analysis of existing research/documents; supervise essays, projects, thesis; organise visits to libraries/ archives. Students participate in courses, seminars, workshops; develop a research project/thesis; review existing literature and do documentary research; collect and analyse data; obtain advice during thesis work; present and discuss work in progress; respond to and engage with commentary and critique (both written and oral); present results in class and comment on the work of colleagues; write a stipulated number of pages; and at doctoral level in all countries, defend the thesis in the presence of experts, often from the «real» world, or in an international context.

Given the types of activities performed and the regular student/ teacher interaction, there is a close link between assessment by the teacher and learners' awareness of progress made. There is agreement on two main points: first, assessment is based both on achievement during the research process —such as quality of written work submitted, participation in group activities— and on the quality of the final product —such as originality, the ability to gather documentary evidence in support of the argument, clarity and independence of thought, concern for coherence and objectivity, clarity of presentation;

second, regular feedback is provided both on process and product from academic supervisors and often from peers as well.

6. **Conclusions**

The comparison of approaches to learning, teaching and assessment from the viewpoint of subject areas on a European wide scale is a new step forward in making higher education transparent. This brief overview suggests that although complex, the task is entirely feasible, given good will and good listening competences.

Bologna introduced the concept of a three cycle structure for higher education in Europe, a challenge which is being confronted across the continent. More recently an overarching «Framework for Qualifications of the European Higher Education Area»[26] has been agreed by ministers in Bergen. Academic leaders of programmes have to develop programmes which are commensurate with new «outcomes approaches» that use levels, level descriptors, qualifications descriptors, learning outcomes, and can more fairly consider the totality of student workload in terms of credits. The work of Tuning is available to assist those who wish to adopt such an approach to curriculum design, teaching, learning and assessment in higher education.

This paper is written with the intention of stimulating further discussion about the issues highlighted and the findings of this consultation with representatives of university departments in 25 different countries[27]. It is evident that as programmes are designed in view of certain outcomes formulated in terms of competences, teaching and learning activities must be designed in such a way as to achieve those outcomes. And assessment practices must be appropriate for ascertaining whether or not the desired result has been obtained. It is hoped that this discussion can serve as a sounding board for further evaluation in subject area groups, inside as well as outside the context of the Tuning project.

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[26] Bologna Working Group on Qualifications Framework, *A Framework for Qualifications of the European Higher Education Area* (Copenhagen, 2005)

[27] The total number of countries that was represented in Tuning II was 27. The total number of countries involved in the competences consultation was 25. This is because the European Studies group will do the consultation as part of Tuning III.

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3.5. APPROACHES TO TEACHING, LEARNING AND ASSESSMENT AND THE SUBJECT AREA COMPETENCES

3.5.1 **History**

1. ***Introduction***

In Tuning 1 the History group found that national and institutional traditions and practices as regards learning/teaching and assessment are quite different. In all cases the overarching objectives of all History programmes and course units which the group set out in its Line 2 paper and in its «cycle level descriptors» are accepted as general goals and as significant learning outcomes; however the ways of reaching them are innumerable. Each national system has its own consolidated ways of transmitting subject specific skills (such as knowledge of how to utilise certain types of sources or approach certain historiographical problems) as well as general strategies for nurturing a critical scientific approach and historical perspective. There are of course analogies and similarities and thus specific solutions or techniques developed in different institutions can be usefully shared. However each system envisages a complex of approaches to learning/teaching and assessment which has evolved as a coherent whole. Therefore the adoption of specific partial solutions is likely to require various adjustments.

In many countries the present phase of application and extension of the Bologna process provides a context in which innovation in curricular design and rethinking overall modes of delivery and planning and coordination of specific course units is possible, desirable and —indeed— inevitable. By linking approaches to learning/

teaching and assessment to particular competences we can create powerful tools for change and positive innovation as well as elements on which quality can be built, monitored, evaluated and enhanced.

In Tuning 1, the History Group defined 30 subject specific competences (reproduced here as Annex 1). Some of these are of interest in all programmes of study; others only in some. To exemplify, competence 17 («Knowledge of Ancient Languages») is considered necessary in many countries for students of Ancient, Medieval and even Early Modern History but not for Contemporary History students; whereas competence 5 («Knowledge of the general diachronic framework of the past») to a greater or lesser extent will be required of all graduates of any history programme. Some subject specific competences will be formed to an increasing extent during the entire course of studies, in the first, second and third cycles. Others are more likely to be targeted in certain moments. For example, competence 29, «Ability to comment, annotate or edit texts and documents correctly, according to the critical canons of the discipline» is considered more important for second cycle students, although in some courses of study (a first cycle degree that prepares for the publishing industry or for work in local archives) it might be considered useful at the end of a first cycle programme.

The first step in curriculum design is the definition of the final learning outcome —required and desired— appropriate to the degree profile of the qualification to be awarded (the «educational outcome»). This outcome is to be formulated in terms of competences, subject specific and generic. Subsequently, in designing the many modules or course units which will lead to that final result, through activities which will require a specified number of hours of student workload measured in ECTS credits, it will be necessary to focus, for each course unit, on a certain number of key competences. In practice, each actual course unit will form several or even many competences. This means that competences will normally be obtained in clusters, rather than one by one.

Since certain approaches to learning/teaching and assessment are most appropriate for forming certain subject specific competences (and certain generic competences), it follows that a variety of approaches to learning/teaching and assessment will be useful in order to form a broad range of competences, and also to provide students, with their individual abilities and propensities, with a range of possible ways of acquiring the necessary competences.

In order to explore the ways that different institutions currently form subject specific competences (or the ways that they could be formed in the future), and to exchange information about them, the

History Group chose 15 of the thirty competences, and examined them comparatively and analytically. Two members of the SAG described each of the chosen competences, looking at how the competence is understood, what learning and teaching approaches are used (or could be used) in their institution to enhance it, what assessment methods are (or could be used) to evaluate students' achievement and how the students themselves perceive the competence and how they can be sure they have obtained it.

The results are discussed below and summarised in table form. Of course the fifteen do not comprise the entire range of competences that any single student will actually need. They are simply examples of how specific learning, teaching and assessment methods are or can be explicitly linked to the formation of certain competences.

2. *Different l/t approaches (types of course unit)*

For clarity we consider the main kinds of learning and assessment activities separately. In practice many course units include several kinds of learning and teaching environment and several kinds of assessment. For example, a part of a course unit may be based on lectures and a part on working groups; assessment might be in part on the basis of a final exam and in part on participation in group discussion.

The kinds of courses used most commonly are the following:

By lectures we intend various learning or —at least— teaching environments in which a teacher speaks to a group of students, and interaction during contact hours is mostly in one direction, teacher to student. In practice lectures can be very formal or quite informal; classes may be very large, running even to hundreds of students, or quite small. In some traditions, and for some individuals, it is normal to read from a text or notes to the students; in others a more informal approach is used; reading lecture notes is frowned on; hand outs are given and discussion is encouraged.

In the category of tutorials we may place a variety of specific ways in which a teacher is regularly available in certain hours for more or less precisely programmed activities. The teacher may «tutor» a small group or individual students. Tutorials may consist of discussion of subject matter presented in lectures; in discussion and correction of written or oral presentations, work on texts or other materials. Often tutorials are linked to lecture courses in order to furnish a chance for personalised discussion and explanation to facilitate the students.

Workshops may be associated with a lecture course or a series of workshops may constitute an entire course unit. In workshops a variety of techniques are used, all of which aim at giving the students the opportunity for informal and practical «hands-on» learning. The teacher may present materials (hand-outs, documents, images) and ask the students to form small groups for discussion and elaboration of an outline, a report or a verbal presentation, which is presented in a final plenary part of the session.

Seminars vary more than might be imagined, but have some basic common characteristics in most systems. They foresee the presence of relatively limited number of students (but with variations from 3 or 4 to 30 to 40) in a less formal context than that of the lecture. Discussion is encouraged. In some countries, institutions, or specific course units, the seminars are organised by assigning to each student the task of preparing and making a presentation on a specific aspect of the general problem or theme considered; during a part or even all of the teaching period, the students make their presentations, one or more per session, and the other students are invited to ask questions and make observations. In other cases the seminar consists of presentations made by the teacher; in this case too questions and observations are encouraged and participation in discussion is often taken into consideration in assessment of the student's performance.

Group work may be of different kinds. An entire course unit may consist of group work, or the group work may be part of several activities carried out for the course unit. In other disciplinary areas groups are often formed in order to implement «Problem- or Task-based» learning (PBL; TBL). In this case there are group sessions with a teacher in which the problems to be solved by the group (or individually) or the tasks to be performed are presented; the groups or the individuals in the groups, perform the tasks or attempt to resolve the problems in the time intervals between the class meetings. Although this approach is not widespread in the History subject area, there are some examples in which group work has an important role. The work may be student defined and driven, in others cases the organising activity is up to the teacher. In the case of student driven learning (as in Roskilde) the groups decide themselves what problems or themes to study and the contact with the teacher has the form of a periodic tutorial or discussion and guidance session. The second typology (teacher defined and driven) is more common and provides more guidance, ensuring that the efforts of the group are directed towards relevant historiographical problems; however the former gives greater autonomy to the students and allows them to develop their independent judgement and self reliance. Overall, both forms appear to be relatively rare in History teaching and learning whereas they would

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seem to be potentially very useful in forming many of the key competences.

Excursions (archives, museums, libraries, study trips and visits) are used to enhance specific competences or to present original materials or environments pertaining to the field of study. They are widely but not universally used.

Placements are an option or are obligatory in many systems. Theoretically the placement should give the student actual «on the job» experience. Common placements for History students are in libraries or archives; or, for those who intend to become teachers, as substitute or assistant teachers.

Elearning and ODL combine various course categories mentioned above. Especially seminars and group work are well adapted to elearning since in essence it offers exceptional possibilities for discussion, shared writing and learning processes and group formation. The number of higher education history institutions using elearning is increasing and there are already some history institutions that offer half of the curricula courses as elearning. Advanced courses use learning management systems, ie. specially tailored learning platforms. Also blended elearning courses are becoming more common. The eHLEE elearning project, developed by the CLIOHnet Task Force C and funded by European Commission, is setting up a code of best practices in elearning for history and it is obvious that for some types of learning outcomes in history, elearning platforms offer particularly interesting methods. eHLEE is preparing an international cooperative history course for 2nd cycle students and is using Tuning competences and methodology in planning the course. International cooperation is particularly feasible in elearning since the access to the course is not dependent on place and students from various countries can attend the same courses.»

Finally, a relevant number of credits and hence workload for History students at all levels is normally reserved for the production of reports, theses and dissertations, based on personal study and research. Since such work is central to the subject area and involves learning, teaching and assessment, we discuss it briefly below under point 5.

In conclusion it must be remembered that each of these general typologies may have diverse specific characteristics in different systems; and are used for different purposes. In the course typologies mentioned above, different approaches —more or less input based or more or less student centred— are implemented according to national practice and tradition and staff awareness, individually and collectively.

3. ***Learning activities***

The l/t activities listed above should more properly be considered teaching formats, which may be linked to or require different learning activities on the part of the student. Although the learner is to be placed at the centre of the higher education process, most thinking and planning still centres on modes of «delivery» rather than on the «learning» activities themselves. The learning activities linked to the teaching formats described above are obvious in their general lines: to lectures corresponds «attending lectures», «taking notes», and, in most systems, «personal study»; in some cases «tutorials» or «work groups».

In most systems, History students must dedicate a relevant part of their work time to «personal study», including such activities as «formulating bibliographies», «reading and personal study of general works», «reading and personal study of monographs or scientific articles», «making outlines and summaries».

Such activities are necessary building blocks for most other activities, such as: «participating in group discussions», «participating in task or problem based learning teams», «preparation and presentation of oral reports»; and «preparation and presentation of written reports.

History students obtain ICT skills of different levels. Most learn to use basic ICT tools, for text elaboration and retrieval of information from Internet and on-line sources. Also useful for History graduates, but not always implemented, are more advanced ICT activities, forming the more sophisticated abilities necessary to find and use digitalised sources and images, to create maps, databases and websites, on-line inventories and so forth. Elearning is also developing an ever greater role among the tools used for History learning and teaching.

Particularly significant for the History Subject Area is «work in archives» or similar (work where original sources are preserved or may be found or accessed). According to the period studied the specific characteristics of these activities varies, but in all cases they represents a necessary phase in formation of research competences. Preparation for individual research work may be carried out through «group reading and comment of texts or sources», specialised tutorials or workshops or the like.

Placements, as mentioned above, in those systems where they are used, commonly take place in libraries, museums, publishing houses or in offices of local bodies or even in universities themselves; for future teachers, in schools as teachers or teaching assistants. In these contexts the work of history students can be useful to the employer or host of the placement period. The placements are clearly useful for the students themselves, as they will gain «real-life» experience in such areas as organisation of activities, of source materials and library resources, creation and updating of information for the public, of shows and exhibits. An emerging area is that of private, city or company archives which second cycle students may be able to reorganise and catalogue or inventory.

Other forms of learning activities with which history students come into contact are language learning, and in general, learning linked to other disciplinary areas.

4. *Assessment*

In the History subject area, assessment methods are largely determined by national tradition or even by national legislation or by the organisation of studies. For example, in many countries examinations are written. The use of «external examiners», as in UK, makes nearly inevitable the use of written exams which can be re-examined at different times by different persons. In some systems the oral examination before a board of at least two teachers is nearly universal (e.g. Italy) whereas in other countries it is not much practiced.

At present, assessment criteria are not always stated (although good practice would require this). They are often considered to obvious or intuitive. For example, for all forms of assessment, it is very often considered self-evident that assessment of the student's performance will take into account clarity of presentation, precision of contents and relevance of contents, good written —or spoken— style, and so forth.

Clearly, though, if an output-competence-based approach is properly implemented, the competences emphasized in programmes as a whole and each course unit must be stated and provided for in designing the relevant approaches to learning/teaching and assessment. Assessment must be designed to ascertain whether or not the announced competences have been formed to the level required by the minimum learning outcomes; moreover the assessment criteria must allow the learner to demonstrate higher levels of achievement.

The more usual forms of assessment used in the subject area are:

Written exams, which may be more or less elaborate and challenging. Written exams may be used at midterm, at the end of term or even more frequently. Usually the student is asked either to answer questions, to comment texts or to write themes. Written examinations may be quite brief or last up to several hours.

They are usually distinguished from quizzes, which are simpler, but also quicker and more «objective» means of ascertaining whether the student possesses certain factual information. Quizzes are «short-answer» or «multiple choice» and are not much used in history studies except as a tool for understanding the initial level of student knowledge at the beginning of a course unit or study programme.

In some systems oral exams are used more commonly than written ones, or even exclusively.

Students may be asked or required to present written or oral reports based on specific reading assignments or circumscribed research tasks. The reports are assessed and the assessment usually is taken into consideration in the final grade or mark for the course unit. In some cases the entire course work may consist of one or more oral or written reports and the assessment hence constitutes the final result in its entirety. In some traditions reports have a codified scheme according to which the argument must be treated (France); in other countries the form is freer (usually the approximate length is specified), although general indications about form may be given. The reports are judged by the interest and accuracy of the contents and usually on the basis of clarity, efficacy and correctness of expression, although these criteria may not be stated.

Classroom discussion/participation: in many of the «teaching formats» identified under point 2, students are encouraged, asked or expected to enter into discussion, asking questions, formulating comments or giving information. The discussion styles in different countries (and even with different teachers) are markedly varied. In some instances, performance in discussion is taken into account in a precise way; in others assessment of discussion is only used as a general indicator of the interest and preparation of the student, to integrate the results of exams or reports; in still others, assessment based on performance in classroom discussion is specifically avoided, in order to encourage students to express themselves freely and to use the discussion in a non-prescriptive, unstilted, brain-storming style.

As mentioned above, a very significant method of both learning/teaching and assessment is based on theses, dissertations or research papers. As this method is central to the subject area, we examine it briefly as a separate point, here below.

5. *Theses, dissertations and research papers*

For some first cycle students, most second and, particularly, all third cycle students in the field of History, the written research thesis or dissertation has a fundamental role both in learning/teaching and in assessment. The production of such a piece of work constitutes an important phase for the learner, who must develop to a higher degree and use «in the field» the competences which have been initially formed in other contexts. The object of producing such a work is both to demonstrate that the learner possesses the competences to carrying out professional historical research, and to enhance or perfect the formation of those competences. Equally important, those competences, both subject specific and generic, must be integrated and coordinated so that the resulting piece of work is original, well structured, scientifically founded, written in correct narrative and linguistic form and organised according to the canons of the discipline. Although the length of the text and the degree of difficulty of the research undertaken varies greatly, according to the level of studies and the national or institutional tradition, assessment always takes into account, more or less explicitly, all the above criteria.

In the case of theses and dissertations, the mechanics of assessment varies considerably in the different national contexts. There may be a specific commission or a single advisor who directs or advises on the preparation of the work; this same or another advisor or commission may be responsible for evaluating the final result. The dissertation may be presented and discussed publicly or not; the public presentation and discussion may be a pure formality, or it may influence or determine the final outcome. In some countries qualifications are awarded with a numerical indication of achievement, based on course work and/or on the dissertation; whereas in others this is not the case.

The third cycle has not yet been systematically considered by the History group, which will take up this task in Tuning 3. Here we may stress simply that research papers, first and second cycle theses and dissertations represent in most systems an important means of forming competences and assessing them in action, and that doctoral dissertations are the fruit of the same kind of activity on a larger scale.

6. *Linking L/T and Assessment methods to specific competences*

As explained above, in order to investigate the ways in which today the subject specific (and generic) competences are formed or in which they could be formed, the members of the Subject Area Group chose a certain number of competences from the list established already. These were chosen on the basis of their perceived relevance (using the results of the Tuning 1 consultation) for the first two cycles and in such a way as to include a variety of different kinds of competences. Members of the subject area (two for each competence) were asked to describe each competence and discuss the ways it is perceived, taught and assessed —or if this does not happen today, how it could be best taught and assessed in the national context in the future. The results of this analysis showed many interesting aspects: first of all it was striking to see how the various competences were interpreted differently in different countries, and second (partly as a consequence) how learning teaching strategies designed to form seemingly identical competences may actually be quite different.

Both observations suggest that, to ensure transparency, an agreed series of terms and definitions will be needed.

Competence 1	Critical awareness of relationship between present and past.
Teaching Method	Confronting students with the fact that current events and issues have historical roots, precedents and/or analogies; showing how historiographical debate is formed and is related to current events and issues; sometimes course units are designed specifically to do this.
Learning Activities	Attending lectures or course, reading assigned bibliography, participating in discussion groups, using e-learning materials, writing papers or making presentations; in some cases by comparing specific historical events or processes to comparable present events or processes.
Way of Assessment	This competence, or awareness, permeates the t/l activities and is not necessarily assessed separately; however when specific course units or activities address this issue it is explicitly taken into account.
Notes	

Competence 2	Awareness of the differences in historiographical outlooks in various periods and contexts.
Teaching Method	Lectures, and group work discussing, presenting examples of historical texts.
Learning Activities	Attending lectures or course, reading assigned bibliography, participating in discussion groups, using e-learning materials, writing papers or making presentations, comparing and contextualising historiographical texts relative to different periods and orientations.
Way of Assessment	Written and/or oral examinations; assessment of presentation, and participation in discussion groups or exercise course.
Notes	

Competence 2	Detailed knowledge of one or more specific periods of the past.
Teaching Method	Lectures, group work, site visits.
Learning Activities	Attending lectures or course, reading assigned bibliography, participating in discussion groups, using e-learning materials, writing papers or making presentations, reading and contextualising texts relative to the period.
Way of Assessment	Written and/or oral examinations; assessment of presentations, and participation in discussion groups or exercise course.
Notes	

Competence 5	Knowledge of the general diachronic framework of the past
Teaching Method	Lectures, exercise courses and/or tutorials on different periods of history or diachronic themes;
Learning Activities	Attending lectures or course, reading assigned bibliography, participating in discussion groups, using e-learning materials
Way of Assessment	Written and/or oral examinations; assessment of participation in discussion groups or exercise course
Notes	

Competence 12	Ability to write in one's own language using correctly the various types of historiographical writing.
Teaching Method	Reading and commenting historiographical texts either in class assisted by the teacher or autonomously.
Learning Activities	Writing assignments to practise producing, different kinds of texts such as essays reviews and summaries.
Way of Assessment	Correction of text and written and oral feed-back to the student, including comparison of their own products with expected results.
Notes	A particular problem to be considered is that of countries in which historiographical texts are largely read and studied in languages other than the local one, creating difficulties in finding appropriate translations for historical concepts and terms, leading to problems of conceptual clarity.

Competence 14	Knowledge of and ability to use information retrieval tools, such as bibliographical repertoires, archival inventories and e-references.
Teaching Method	Presenting the most important tools, explaining the different citation criteria, providing with lists of reviews, reference books, visiting libraries and archives, showing how to find materials or repertories preserved electronically, teaching not to trust references without checking.
Learning Activities	Learning by doing, carrying out tasks, finding and using books and other materials, catalogues and inventories, finding electronic materials and so forth.
Way of Assessment	Checking result of the exercise and giving feed-back and advice.
Notes	

Competence 23	Awareness of and ability to use tools of other human sciences.
Teaching Method	Some institutions allow or require students to take courses in other disciplines. In others, students acquire knowledge of other human sciences from lectures and reading books or articles from related fields. For some directions of study, tools from other disciplines are necessary, such as quantitative methods.
Learning Activities	In addition to the coursework, sharing experiences with students studying in related fields.
Way of Assessment	Assessment according to the methods used in the related field, such as examinations and field work or anthropology and archaeology, tests for statistics and so forth. When the specific tools are required in history courses the ability to use them appropriately and correctly is assessed.
Notes	

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Competence 28	Ability to give narrative form to research results according to the canons of the discipline.
Teaching Method	Assigned papers, workshops, specific activities for guidance in writing and giving references, individual tutoring.
Learning Activities	Writing (drafting, correcting).
Way of Assessment	Papers prepared for courses are corrected and feedback given, final year dissertation or thesis is discussed and corrected before final presentation.
Notes	

Second Cycle:

Competence 9	Ability to communicate orally in foreign languages using the terminology and techniques accepted in the historiographical profession.
Teaching Method	Language courses and laboratories, history courses in foreign language, reading history texts in other languages, Erasmus mobility experience or similar (including virtual mobility).
Learning Activities	Grammatical and lexical study and practice, practice in speaking, oral presentation and discussion in the language, working with foreign students of the required language, video conferencing.
Way of Assessment	Oral exams, assessment of presentations and participation in discussions.
Notes	This competence has a different weight in different countries.

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Competence 15	Knowledge of and ability to use the specific tools necessary to study documents of particular periods.
Teaching Method	Generally, exercise courses using original documents, also study of appropriate languages, and other tools, courses in text analysis, image analysis and so forth.
Learning Activities	Reading, observing analysing documents and other sources and objects, studying how they have been produced and preserved; evaluating and contextualising the information they provide.,
Way of Assessment	Assessment is based on accuracy of transcription and quality of interpretation.
Notes	

Competence 22	Knowledge of world history.
Teaching Method	Lectures, workshops.
Learning Activities	Attending lectures and reading assigned bibliography on histories of peoples of other continents and of global processes; workshops.
Way of Assessment	Written and oral exams, assessment of reports, presentations and participation in discussions.
Notes	

Competence 25	Defining research topics suitable to contribute to historiographical knowledge and debate.
Teaching Method	Research seminars and individual supervision.
Learning Activities	Participation in seminars and scientific conferences; preparation and choice of topic, compilation of bibliography, survey of sources.
Way of Assessment	Evaluation of project by tutor/supervisor and by fellow students.
Notes	

Competence 26	Ability to identify and utilise appropriately sources or information for research project.
Teaching Method	Research seminars and individual supervision, workgroups, and small exercise courses on specific source typologies and methodologies.
Learning Activities	Critical examination of specific sources by individuals or in small groups, comment and criticism of sources.
Way of Assessment	Evaluation of performance in above activities.
Notes	

Competence 29	Ability to comment, annotate or edit texts and documents correctly according to the critical canons of the discipline.
Teaching Method	Presenting and explaining to students good examples of editions of different kinds documents and texts.
Learning Activities	Learning by doing: preparation of text or documents for edition with proper apparatus.
Way of Assessment	Assessment according to scholarly standards, feedback to the students and comparison of the work done by fellow students.
Notes	

Competence 30	Knowledge of didactics of history.
Teaching Method	Lectures, workshops, placements.
Learning Activities	Study of theoretical and practical aspects of educational sciences as they pertain to history; planning courses (cognitive maps), teaching materials, including multimedial materials; taking part in practical exercises in class and in schools; exercises in didactics for museums.
Way of Assessment	Oral exams, assessment of presentations and performance in placement, self evaluation journal or log, joint assessment with secondary school teachers acting as supervisors.
Notes	This competence has a different weight in different countries: in some countries pedagogy or didactics is taught separately from disciplinary courses; in others teaching aspects are part of the history curriculum.

7. ***Conclusions***

Many of the findings indicated or hypothesised in Phase 1 of Tuning have found confirmation in Phase 2. Here it is useful to restate, schematically, the following:

1. Each national system can and must be seen as a coherent whole, in which the order, the contents, the teaching/learning and assessment methods are related to each other.
2. All the systems are in agreement as to the general ethical and heuristic reasons for studying-learning-teaching History, and aim to encourage critical historical perspective in their students. This aspect of the subject area is summarised in the «overarching» competences or attitudes which we indicated in the Cycle level descriptors given in Tuning 1.
3. Contents (factual knowledge) and the order in which study of contents is organised in each national system vary very widely. Nonetheless comparability and transparency are possible using a competence-based approach.
4. History studies can form a basis for a variety of professions, not all of them explicitly linked to the subject area. Some subject specific competences are of interest and benefit for all citizens; and some key generic competences are formed effectively through History studies.
5. Other disciplines and competences (relative to the learner's own language, other languages, such related fields as philology, geography, archaeology, social sciences etc.) are essential for the formation of a historian or more generally for the formation of a critical historical mentality and hence must be included in history study programmes.
6. The subject specific competences and the valuable generic competences which history studies form can only be fully developed if the learner is exposed constantly to original sources and to professional historical research. Textbook level teaching of contents does not encourage or even allow the formation of the desired competences.

Above and beyond the general findings listed above, the analysis carried out in Tuning 2 of the ways in which history higher education endeavours —or could endeavour— to form the subject specific and generic competences defined has yielded important and significant results. It is true that the main methods of teaching learning and assessment can be described as variants of certain nearly universally used typologies (e.g.

lecture, seminar, written exam, paper, oral exam). However it is in the highly variable details of each that there is most to learn.

Traditions and practices specific to one or a few national systems may be completely absent in other systems. Sharing knowledge and insight about learning, teaching and assessment methods can yield important benefits. Overall, with respect to the other subject areas, the History subject area offers particular experience in forming not only its own competences such as «placing processes and events in a chronological framework», but also competences that are generally relevant, such as «ability to gather and integrate information from a variety of sources», «appreciation and respect for diversity and multiculturality». This knowledge can be shared, and in any case all those students who take some course units in History, although their degree programme may be in another subject area, will benefit by making explicit efforts to form the key history competences.

On the other hand, History studies are not always organised in such a way as to encourage the formation of some other generic competences which would be of use to History graduates, both in their profession, in particular those regarding interpersonal skills. For example, where as «teamwork», «decision-making», «ability to communicate with experts in other fields» etc. may be considered very important in other subject areas, they are often ignored or not specifically provided for in History studies.

Consequently, History graduates and historical studies will have much to gain if innovative approaches to learning, teaching and assessment are taken into consideration explicitly and implemented. Sharing the knowledge and experience available in the subject area and, particularly, adapting and utilising that existing in other subject areas, will be important tasks for the future.

Prepared by Ann Katherine Isaacs

ANNEX

List of Subject Specific Skills and Competences for History

Note: Those examined for the first cycle appear in ***bold italics***; those for the second cycle in **normal bold.**

1. ***A critical awareness of the relationship between current events and processes and the past.***
2. ***Awareness of the differences in historiographical outlooks in various periods and contexts.***
3. Awareness of and respect for points of view deriving from other national or cultural backgrounds.
4. Awareness of the on-going nature of historical research and debate.
5. ***Knowledge of the general diachronic framework of the past.***
6. Awareness of the issues and themes of present day historiographical debate.
7. Detailed knowledge of one or more specific periods of the human past.
8. Ability to communicate orally in one's own language using the terminology and techniques accepted in the historiographical profession.
9. **Ability to communicate orally in foreign languages using the terminology and techniques accepted in the historiographical profession.**
10. Ability to read historiographical texts or original documents in one's own language; to summarise or transcribe and catalogue information as appropriate.
11. Ability to read historiographical texts or original documents in other languages; to summarise or transcribe and catalogue information as appropriate.
12. ***Ability to write in one's own language using correctly the various types of historiographical writing.***
13. Ability to write in other languages using correctly the various types of historiographical writing.
14. ***Knowledge of and ability to use information retrieval tools, such as bibliographical repertoires, archival inventories, e-references.***
15. **Knowledge of and ability to use the specific tools necessary to study documents of particular periods (e.g. palaeography, epigraphy).**
16. Ability to use computer and internet resources and techniques elaborating historical or related data (using statistical, cartographic methods, or creating databases, etc.).
17. Knowledge of ancient languages.
18. Knowledge of local history.
19. Knowledge of one's own national history.
20. Knowledge of European history in a comparative perspective.
21. Knowledge of the history of European integration.
22. **Knowledge of world history.**

23. ***Awareness of and ability to use tools of other human sciences (e.g., literary criticism, and history of language, art history, archaeology, anthropology, law, sociology, philosophy etc.).***
24. Awareness of methods and issues of different branches of historical research (economic, social, political, gender related, etc.).
25. **Ability to define research topics suitable to contribute to historiographical knowledge and debate.**
26. **Ability to identify and utilise appropriately sources of information (bibliography, documents, oral testimony etc.) for research project.**
27. Ability to organise complex historical information in coherent form.
28. ***Ability to give narrative form to research results according to the canons of the discipline.***
29. **Ability to comment, annotate or edit texts and documents correctly according to the critical canons of the discipline.**
30. **Knowledge of didactics of history.**
31. Other (specify).

3.5.2. **Nursing**

Good teaching means that Faculty, as scholars, are also learners.

Boyer 1990:23-4

There is a well established knowledge and evidence base associated with the learning, teaching and assessment of nursing and nurses: some illustrative texts are outlined at the end of this paper. Boyer's scholarship typology can be aptly applied to nursing in so far as he considers four types of scholarship: that of discovery/research, integration, application/service and that of teaching itself. Nurse learners, whether before or after qualification, are by definition adult learners undertaking an academic, professional/vocational programme of studies that includes both theoretical and practical knowledge, behaviours and attitudes and the ability to perform in routine and unpredictable situations. The pedagogical knowledge base includes concepts and research associated with andragogy, experiential learning, work based learning, organisational cultures and learning, decision making, development of leadership skills, social psychology of learning, values, ethical and emotional literacy to name but a few.

The different approaches to learning have all been included in the history of curriculum design and implementation, for example cognitive, behavioural, constructivist and post modern approaches to nursing and nurse education. Theories of competence acquisition, clinical decision making, mentorship, expert practice (Benner), tacit knowledge (Polanyi) and reflection (Schon, Johns, Gibbs) are well established. Theories or models that have been applied to nursing include Bloom's cognitive taxonomy of learning, Steinaker and Bell's experiential taxonomy; Dreyfus and Dreyfus and Benner's work on novice to expert development. There is an increasing emphasis on collaborative learning styles, especially at second cycle level. With at least fifty per cent of the registration programme being practice based, understanding and applying the evidence based of how students learn and develop in practice is crucial. A typical developmental model is that of Benner outlined in Box 1.

Box 1 Benner 1984. Novice to Expert - a developmental model

Benner conducted research using the Dreyfus Model (1981) which posits that the acquisition and development of a skill a student passes through 5 levels of proficiency

- —novice.
- —advanced beginner.
- —competent
- —proficient,
- —expert.

These stages reflect changes in 3 general aspects of skill performance

(1) Movement from the reliance on abstract principles to the use of past concrete experience as paradigms.
(2) From learning pieces to a complex whole with the ability to focus on relevant components at a time.
(3) From detached observer to attached performer.

Example using Blooms cognitive taxonomy: applied to the theoretical comprehension of medications

Level 6: Valuing	Draw conclusions, defend, and make decisions *Realizes patient is in pain, reviews medication chart and following patient assessment and dialogue, chooses appropriate medication from prescription list. Suggests change in therapy following evaluation of effectiveness.*

Level 5: Synthesis	Draw conclusions, find connections, derive, make comparisons *Patient complains of dizziness, especially on getting out of bed. Reviews patient and realizes that two medications may be interacting to the patient's detriment.*
Level 4: Analysis	Find parts in a whole and connections, discern, criticize, and make comparisons. *Reviews a patient's health status and medication regime and can explain the rationale behind the medication therapy for this particular patient.*
Level 3: Application	Demonstrate, explain, make use of knowledge *Knowledge of action of steroids enables student to explain to patient the importance of glucose monitoring while on these drugs.*
Level 2: Understanding	Formulate knowledge in own words, explain, account for, show differences *Able to recognize the difference between diuretics that are potassium sparing and those that are not.*
Level 1: Basic knowledge	Define, declare, count, recognize Can identify normal therapeutic range of common drugs.

The concept of *differentiation* is crucial to nursing to enable development, progression and achievement of safe, intelligent practice in the «real» world of patients and their families/loved ones. This is why we argue for a sub first cycle level descriptors en route to the first cycle achievement of competence. Many typologies of learning do not accord value to the role of apprenticeship, craft knowledge and skill acquisition that are often fundamental to learning in a person based practice.

Models of learning and teaching

Through analysis of nursing in our representative 13 countries, we considered that while there is a place for many different models of learning and teaching in nurse education, the models are used in different proportions according to the resources available and the developmental stage of the learner (e.g. Figure 1). Typically there are the (1) traditional methods of instruction (2) behavioural and instructional models (3) constructivist models and (4) collaborative approaches to learning. However, as previously indicated, there is often insufficient attention to experiential learning, learning in the workplace and the established and extensive research base in this field. The traditional model —or apprenticeship model still has an important place in learning nursing for novices or at the novice stage of a more complex competence acquisition. These methods are relevant to the development of safe practice, for examples learning lifting and handling of patients and the safe and precise acquisition of procedures. Craft knowledge is often passed on traditionally and it is appropriate to do so in workplaces where role modelling and coaching develop practises ahead of the evidence base: this applies to both novices and experts.

Many first cycle programmes have increased their emphasis upon collaborative learning approaches as evidenced by enquiry based and action learning styles. Behavioural, instructional and constructivist models are often used for teaching skills. In contrast, second cycle programmes tend to focus more upon constructivist and collaborative models of learning.

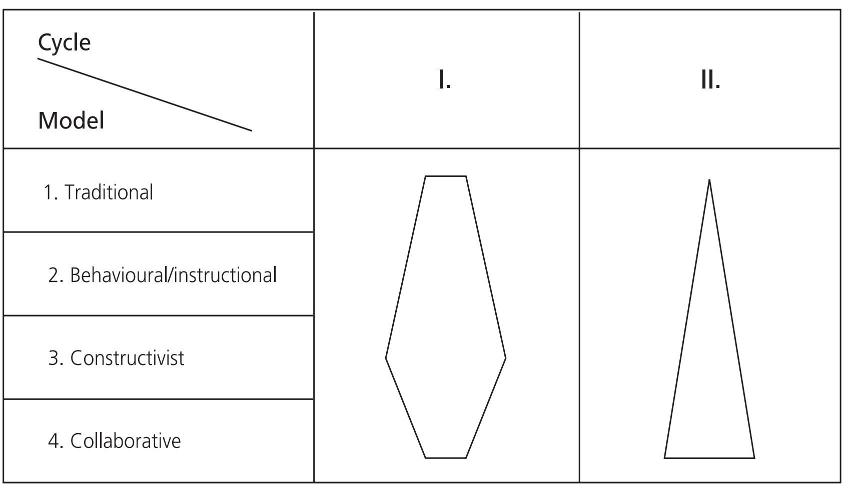
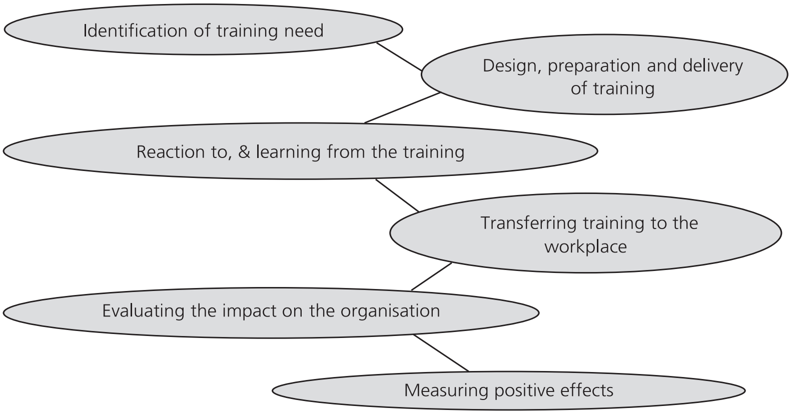


Figure 1

A theoretical conceptualisation of how the four models may be balanced within first and second cycle curricula

When human and material resources become available, there is a rise in small group work and technology assisted teaching/learning. During recent years there has been an increasing use of reflective, critical approaches to learning matched by the use of informatics to support web based and work place learning. Practical skills are often developed through observation of practice, demonstrations, simulations, role play and exposure and engagement in real clinical experiences. However, many countries reported the challenges encountered during work placed learning placements when there may be problems with student supervision and the quality of patient care. To this end, where available, resources are now being allocated to support learners in practice, to prepare students for practice through clinically based wards, clinical skills laboratories and through the use of simulations or virtual practice.

Critical enquiry has been fostered by enquiry, problem, scenario and action based learning. Role play and other experiential modes are adopted in a variety of forms to develop communication skills, team building and to sensitise students to the experience of patients and clients (e.g. blind walk, being fed on one's back); to enable rehearsal of skills and emotions (breaking bad news); decision making and prioritisation (games, simulations). Interprofessional learning is now more common and is developing its own evidence base (Barr 1998). Training Needs Analysis combined with workforce review and skill mix analysis are often used to identify education and training needs, particularly in post qualifying education. Here is a typical model.



Training needs analysis

Adapted from Spilsbury M 1995 Measuring the Effectiveness of Training, IES, Brighton; Figure 3.1. p. 12.

Teaching terms/ methods See reference list for definitions	Typical use by Tuning Departments in nursing: Frequently/Sometimes/Rarely												Definition or meaning if used in your country for nursing (or give reference to a defined text commonly used- see Annex 3)
	B	**D**	**F**	**G**	**H**	**I**	**M**	**Ne**	**No**	**Sk**	**Sp**	**UK**	
Lectures	F	F	F	S	F	F	F	F	F	F	F	F	Teacher led session largely informative
Tutorials	S	F	F	F	S	F	S	S	S	F	F	F	Teacher facilitated topic based interactive session for one or more students
Small group	F	F	F	F	F	F	S	S	F	F	F	F	Varies upon course and no of students
Large group teaching	S		S	R	F	F	F	F	F	F	F	F	
Practicals	F		*	*	F	F	S	S	F	F	F		Rehearsing practical skills in a non clinical environment
Practice in clinical areas	F	F	S	*	F	S	F	F	F	F	F	F	Nursing experience
Laboratory work	F	S	*	*	F	F	*	*	F	S	F		Using scientific laboratories for experiments or investigations
Reading	S	F	F	F	F	F	F	F	F	F	F	F	
Guided study	f	F	F	F	F	F	F	F	F	F	F	F	Prepared work for students on given topics
Workbook	F	F	S	R	F	S	F	F	S	F	F	S	Structured theoretical tasks that are recorded in written format
Discussion	F	F	F	F	F	F	S	S	F	F	F	F	Oral exchange of ideas
Debates	S	F	F	F	F	S	S	S	F	F	S	S	Contesting and defending ideas
Role play	F	S	R	S	F	F	S	S	S	S	F	S	Acting a part
Simulation	F	R	R	R	F	R	S	S	S	S	F	F	Practising situations that are not «real»
Observational visits	S	R	S	R	F	R	S	S	S	S	S		
Visits to …	S		R	S	F	S	S	S	S	F	S	S	Institutions, departments
Problem based learning	S	S	S	S	F	F	S	S	F	F	S	F	

Teaching terms/ methods See reference list for definitions	*Typical use by Tuning Departments in nursing: Frequently/Sometimes/Rarely*												*Definition or meaning if used in your country for nursing (or give reference to a defined text commonly used- see Annex 3)*
	B	***D***	***F***	***G***	***H***	***I***	***M***	***Ne***	***No***	***Sk***	***Sp***	***UK***	
Virtual learning	S	F	F	S	S	R	R	R	F	R	S	F	
Enquiry based learning	S		S	S	F	F	S	S	F	S	S	F	
Portfolio development	R	S	S	S	F	F	F	F	F	S	S	F	
Interprofessional learning	F	S	S	S	F	F	S	S	F	F	F	F	Two or more professional disciplines learning together
Life long learning	S		F	F	F	S	F	S	F	S	R	F	
E learning	S	S	F	S	S	R	R	S	F	S	S	F	
Distance learning	R	R	F	R	S	R	R	R	F	S	R	R	
Discovery learning	R		S	S	S	S	S	S	F	S	S	R	
Experiential learning	F		F	F	F	S	S	F	F	F	F	F	
Information technology based or web based	S	F	F	F	F		R	F	F	F	S	F	
coaching	F	F	F	F	F	F	S	F	F	F	F	S	
supervision	F	F	S	*	F	S	S	S	F	F	F	F	Supervisor in clinical setting
games	S		R	R	F	R	R	R	S	S	R	R	
internship	R		*	F	F	*	*		S	S	R	R	
Clinical teaching	F	F	R	*	F	S	S	F	F	F	F		
shadowing	S	R	S	*	F	*	*	F	S	F	F	R	Observing and following a practitioner to learn their role and actions
Video/audio tapes	F	F	S	F	F	S	R	F	F	F	F	S	
drama	S	R	R	R	S	R	R	R	S	R	S	R	
Special studies/ projects/ dissertations	F		F	F	F	F	F	F	S	F	S		All have a final year special project but some may have other projects.

Learning nursing in the practical/clinical setting

As previously noted, at least 50 % of the registration programme currently comprises clinical, practical or work based learning. This environment is often described as the clinical learning environment: «an interactive network of forces influencing student learning outcomes in the clinical setting» (Dunn and Burnett, 1985). Various names are given to the clinician who teaches, supervises and assesses the student nurse in practice. These include; mentor, coach, supervisor, teacher, assessor. There is a confusion of terms and their application between and within countries. Simms (1993) suggests that the following elements are part of the role of the supervisor in practice:

Roles of supervisor in practice (Simms, 1993)

Symbol	Colleague
Communicator	Role Model
Disciplinarian	Human Being
Mentor	Advocate
Teacher	Guide
Enabler	Consultant
Assessor	Decision Maker

The roles and respective accountability for the quality of the clinical learning environment are outlined in appendix. This table demonstrates the complex stakeholder involvements in student learning in practice and the role of competent authorities. In the first cycle with registration programme, clinical or practical education of the student is required to enable the student to meet the aims, outcomes and competences of the curriculum so the student may be competent as a practising nurse. In some countries, there are now requirements for competences after registration with the development of advanced, specialist nurse practitioners (e.g. Republic of Ireland)

There is significant evidence to confirm that quality in the clinical learning environment is related to how students are treated (humanistic or not), team spirit, leadership and management style of the senior clinician and available support for teaching and learning. Audits of clinical learning environments may be undertaken by the educational provider, regulatory bodies or quality assurance agencies. In these situations it is typical for the following items to be considered: (see also table)

—Number, experience, qualifications and mix of clinical staff.
—Motivation of staff.
—Research or evidence base of clinical practice.
—Patient/staff ratios.
—Relationship between educationalists and clinicians.
—Philosophy of nursing care.
—Learning opportunities and supervision of students.
—Development of staff.
—Quality of patient care.

In the example below, we have used real curriculum issues from Hungary to demonstrate how the various learning theories relate to developing nursing practice. The way that curricula are developed is not only cultural, but in nursing reflects the stage of nursing within that country and where it is situated and controlled. Historically, there is tendency for nursing to initially reflect a biomedical model before emerging its own models and theories of practice. As the model changes so do the pedagogies and assessment strategies. Curriculum expression reflects also the curriculum design, resources available and teacher/student capabilities. Assessment strategies in nursing at first cycle with registration need to address both theoretical and practical based competences. Diverse strategies are used to reflect the assessment of knowledge, skills, attributes and professional values. In the interests of public safety, each programme will identify core components that must be passed in order to achieve the necessary licence/registration to practice. These assessment strategies range from examinations of theory and observed episodes of practice to continuous assessment, viva voce, portfolio use and project work.

This next example is based upon a draft, constructed and used by College of Health Care of Semmelweis University Budapest. With permission, this example has been adapted and augmented by the Tuning nursing group. The italicised comments indicate associated learning, teaching and assessment theories.

The instructions and requirements of the nursing clinical practice educational process have to be gradually built stage by stage

Level 1

At the beginning the practice room is designed to be life —like using ward equipment and audio-visual demonstrations. Nursing procedures are introduced by a university teacher assisted by a demonstrator (often a former successful student). Here, in the practice room, students can observe not only the entire activity, but also its component parts augmented by teacher commentary and student /teacher interaction. More complicated exercises are shown a couple of times, in order to enable the students to learn the entire task.

This is classical skill teaching incorporating humanistic, behavioural approach to skill acquisition. The whole performance (gestalt) is shown first at normal speed and quality, followed by the demonstration and rehearsal of the logically derived components or steps of the skill. Once the individual components are successfully learnt, the whole skill is practised.

The exposure level of Steinaker and Bell's taxonomy where role modeling by the teacher and demonstrator are essential. Novice stage of Benner's model.

Level 2

Following the observation of the skill/activity, under the supervision of the demonstrator, the student practices individual elements of the skill. The practice of the activities takes place on this level in individual, couple or teamwork, depending on the skill/tasks. The teacher and the demonstrator are continuously supervising the work of the students and supply them with support and information or help executing the nursing procedure if needed.

This reflects the participation level of Steinaker and Bell's taxonomy. Coaching is evident in this stage. Advanced Beginner stage of Benner's model.

Level 3

Here, the student can complete the activities, skills or tasks in their entirety. Minimal supervision should be required for safe, effective performance. Students should now be able to outline the indications and contra-indications of single nursing procedures, the equipment needed for the intervention, the somatic and psychic preparation of the patient and the execution of the activity. Students should be able to manage a practical example within the practice room and be examined in this context.

At this point, within the practice room context the student has reached the competent stage (Benner) and the identification stage (Steinaker and Bell). However to be competent in practice, the student has to be able to apply this learning and performance to the real life contexts with real patients and staff. In this respect the student has not yet demonstrated competence in the clinical environment.

Level 4

During guided clinical nursing practice, students are enabled to learn, practice, check and evaluate nursing procedures in real-life situations. At this stage, the leader of practice (supervisor of practice) promotes the recall of the students' knowledge in connection with the given activity, and then presents the student with a practical example in the real-ward (e.g. the care of a patient confined to bed). The student then practices the activity under the supervision and evaluation of the leader of the practice. On this level, the leader of the practice is present at every activity of the student.

The student should be demonstrating safe and effective performance and thus competence. This should be the internalization stage of Steinaker and Bell

Level 5

This is the last stage, which leads to the final exam. Here, students are capable of independent work, although they are still supervised and evaluated. During this clinical practice they will need to proved that they comprehend the daily routine, and can demonstrate adequate knowledge concerning the given nursing actions and interventions. The activities are executed with maximum precision, students are aware of their competences and the methods to avert possible complications, thus the leader of the practice can entrust to the students the organization of the daily routine and individually performing patient-care in the practice room and the real situation.

In this stage, students are ready for practice and fit for the purpose of being a registered nurse. They can identify with being a nurse (Steinaker and Bell) and for the more able student can teach their juniors (dissemination phase of Steinaker and Bell). Students may still be context bound in their learning and revert to previous levels of competence if they are unable to transfer their competence to different client groups or contexts of care where the salience of cues, signs and actions may be different (Benner)

All levels of the practical training are «Guided Clinical Nursing Practice» where the continuous activity and control of the leader of the practice is needed; the student cannot be left alone. Meanwhile the style of the leader's supervision, teaching and support of the student will vary according to the student's competence, the context and the complexity of the client's care and needs. *The models of teaching to complement the development of the student are different and are outlined by both Benner and Steinaker and Bell.*

Assessment issues

Assessment strategies in nursing at first cycle with registration need to address both theoretical and practical based competences. The range of assessment strategies incorporated within nursing are diverse to reflect the assessment of knowledge, skills, attributes and professional values. As curricula move from a biomedical based content driven approaches to nursing, health needs and outcome or competence based curricula, the assessor and their role changes. For example the extent to which medical/scientific staff are involved in the delivery and assessment of the curriculum diminishes. Conversely, when there is a significant social sciences content, students may be taught by non nurse academics like ethicists, psychologists and sociologists until there are nurse teachers with this expertise. Inevitably, the focus and type of assessment will then reflect the tradition of the teacher. For example emphasis on disease orientation, social structures, person centricity with or without application to nursing practice and theory. As the academic nature of the programme rises, there is a move from content recall assessment to critical appraisal and scenario based assessments. Some of these various differences are illustrated in Annex 1 and 2.

Annex 1 from Hungary represents what would be termed as a biomedical approach to nursing. It includes the criteria for clinical examinations and assessment in clinical practice and has a clear medical focus in language and content. In contrast, annex 2 from Norway outlines the purpose, organization and application of practical nurse training. This model reflects a more contemporary nursing focused curriculum and is derived from their «General Plan and Regulations for 3 year Training Programme in Nursing» dated January 2000. The 2004 updated version of this national framework has not yet been translated into English.

Some illustrative texts used for the learning and teaching of nursing

Annex 3 provides **a few** examples of the many texts available; we have tried to use different texts for the English speaking countries to offer broader perspectives. This list should not be seen as a list of recommended texts, rather an indication of the depth and breadth of material available. The list includes (1) texts used for the students at first cycle level for clinical teaching, (2) texts used for the theoretical teaching, as well as (3) texts regarding the pedagogy or didactics of nursing. Definitions of terms will be found in the didactic texts.

This paper has tried to encapsulate the diverse and common threads within the learning, teaching and assessment of nurses and nursing. We have indicated how the development of nursing within a country is influenced by its status, history, the role of women in society, the resources available, the relationship with medicine, the Universities and the health services. Together, these and other factors shape the nature of the nursing curriculum, where it is taught, what the balance of the curriculum may be and who may teach/assess the student nurse in both theory and practice. Not withstanding these differences, we have also shown that nurse education involves a range of diverse pedagogies as it endeavours to enable students to be safe and competent practitioners within an ever changing environment.

Prepared by Mary Gobbi with contributions from Sandor Hollos, Bjorg Dale, Grace Jaccarani

ANNEX 1
Example from Hungary

1. **Abilities for collecting data**

During the student's practical activity we are eager to know how precise and deliberate his/her collection of data is, if he/she uses the direct and indirect communication techniques.

1.1. *Anamnesis*

—complete anamnesis,
—adequate technique/culture of interrogation,
—correct examination of the problems,
—the art of hearing.

1.2. *Objective data*

—complete execution of viewing and observation,
—helping the physical examinations appropriate for the illness,
—ordering laboratory and other examination and organizing their execution,
—executing examinations with tools and instruments.

1.3. *Documentation*

—systematizing the patients' data,
—accurate formulation of the information,
—precise and brief record of data,
—registering the time and result of the interventions.

1.4. *Case-review*

—nursing anamnesis covering every need and problem,
—recording accurate nursing status,
—recording former illnesses, operations, examinations and medicine allocation,
—brief and clear professional report on the patient.

2. Clinical decision-making abilities

In this field of the student's practical activity we want to know how precisely established his/her decisions are, if he/she knows the outcome of his/her decisions, if he/she is able to apply problem-solving in nursing.

2.1. *Making a nursing plan*

—very accurate collection of data,
—setting up correct nursing diagnosis,
—choosing the right nursing interventions from the alternatives,

—activity done according to the changes of the patient's condition,
—evaluating the result of the intervention,
—doing the necessary modifications.

2.2. *Executing the therapeutic plan*

—precise allocation of medicines,
—professional execution of therapeutic interventions,
—ordering examinations with tools and instruments, the organization of their execution,
—detecting complications and adequate action,
—using cost-effective medicines, bandage and medical aids.

2.3. *Work organization*

—keeping order, discipline and hygiene,
—correct division of work among members of the nursing team,
—good cooperation between the members of the health care-team,
—adequate communication with the diagnostic departments,
—ensuring medicine, bandage and medical aid necessary for patient care,
—supplementing the lacking or malfunctioning tools in time.

3. Role-development

During evaluation we would like to know what changes the student's personality has undergone during practice, if he/she corresponds to required behavioural expectations of nurses.

—uses effective communication skills,
—building up good relations with his/her patients and co-workers,
—making decisions according to his/her competences individually,
—knows the legal-ethical relations of his/her work,
—his/her behaviour always corresponds to the given situation,
—able to work effectively as a member of the health care-team,
—able to continuously develop him-/herself.

ANNEX 2

Example of practical training curriculum from Norway (based on 2000 Regulations)

1. The aims of practical training

The aims of practical training: The student must

—study, learn and participate in practical nursing in medical and surgical wards, in mental treatment, in services for the elderly, and in home care as part of the total treatment that the patient is in need of;
—have knowledge about and acquire nursing experience and experience in cooperating with other occupational groups in preventive health care and in prenatal and postnatal care.

In the course of the practical training, the student must

—study, experience and develop nursing competence in relation to different diseases and in different patient situations, both in specialist services and in municipal health services;
—under supervision practice, reflect upon and develop knowledge, skills and attitudes in direct interaction with patients, next of kin, and other occupational groups;
—develop nursing competence in cooperation with experienced professionals, and acquire insight into one's own limitations and the qualifications of others;
—reflect upon and discuss ethics, patient care and practical nursing;
—develop the competence and will to cooperate with different occupational groups;
—instruct and supervise patients and next of kin;
—develop the competence to communicate with different patient groups and their next of kin;
—assess and get experience with the structure and organization of health and social services;
—gain experiences which may be discussed at the college and used as a basis for further learning.

2. Fields and duration of the practical training

The practical training must constitute a total of 30 credits. The duration of practical training in the various fields is described in terms of weeks. 30 credits correspond in this plan to a total study period of 60 weeks. At least 50 of these weeks must consist of practical training with patients and next of kin. 10 weeks may be used to acquire skills, and for preparation and reflection upon the practical training periods. The curriculum guidelines of the college describe how the practical training periods are planned in relation to other study

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methods, such as individual study, project-oriented learning and study periods in connection with the practical training. The college's curriculum guidelines give a closer description of distribution, sequences, guidelines and aims of the practical training. The distribution of the practical training periods presupposes that the practical training in an institution takes up on average 30 hours per week.

An outline of the fields and duration of the practical training periods

A. Skills, preparation for and reflection

Upon the supervised practical training	**10 weeks**
B. Practical training with patients and next of kin. . . .	**50 weeks**
Specialist health services:	
Practical training in medical and surgical wards . . . . The practical training must be of minimum 6 weeks in a Medical ward and minimum 6 weeks in a surgical ward	minimum 16 weeks
Municipal health services:	
Nursing services in municipal health services, care for the elderlyand home care . . . . Of these must minimum 8 weeks be practical training in home-based services or in nursing homes	minimum 12 weeks
Specialist or community health services:	
Practical training in the first year of training.	minimum 4 weeks
Practical training in mental health care	minimum 8 weeks
Other types of practical training in the B category	maximum10 weeks

The practical training in health services must include training in an out-patient surgery, operating rooms, intensive care units, in preventive care, and prenatal and postnatal care. This practical training may take place both in fields where a minimum duration is given or in «Other types of practical training in the B category». However, practical training under «Other types of practical training in the B category» should primarily take place in fields where a minimum duration is given.

3. **Detailed description of practical training**

When learning practical nursing skills, interaction and communication with patients, next of kin and other occupational groups, the student must be given a practical training which enables her or him to benefit from other people's experiences within the requirements of rules and regulations and based on the patient's integrity and self-determination. During the supervised practical training periods nursing students must gain experience from working in cooperation with others. The practical training is divided into practical training in the first year of study, supervised practical training, and observation training.

Practical training in the first year of study

The purpose of practical training in the first year is to give students early in the study an understanding of nursing as a profession, and the role of nursing in large organizations. The practical training should preferably take place in the first semester and have the duration of minimum 4 weeks. The college determines whether the training should take place in municipal or specialist health services, and whether the training should be supervised or not. The experiences should form the basis for the college-based academic and practical introduction to nursing as a subject. The college cooperates with the institutions where the practical training takes place when developing the guidelines for the organization and implementation of the training programme.

Supervised practical training

The purpose of supervised practical training is to give the student optimal operational competence in order to meet the nursing needs of patients and society as part of a complete health service. The student must have supervised practical training of minimum 8 weeks within each of the following fields: medicine, surgery, mental health care and municipal health services. (The minimum requirement for medicine or surgery is 6 weeks.) All students must have supervised practical training in home-based services. Supervised practical training implies that the college's teaching staff supervises and organizes good learning environments. Thus, the college has the main responsibility for the quality of the supervision; a responsibility that requires frequent supervision and presence of teaching staff in the practical training periods. The nurses working in the institution where practical training takes place are responsible for the supervision and instruction in the specialist nursing skills required in that particular field. In many nursing services learning situations may take place night and day. The student organizes the practical training in such situations in cooperation with the nurses and the college's teaching staff.

During the supervised practical training the student must be supervised continuously preferable by nurses with supervision competence and at least one year of work experience as a nurse. The college is responsible for offering nurses at institutions where practical training takes place courses or education in supervision. Before every practical training period the college and the institution where the training takes place must in cooperation formulate concrete plans for the practical training which describe what the students may learn at that particular institution. The college has the main responsibility for ensuring that the plans are in agreement with the curriculum guidelines and the general plan. The institution where the practical training takes place is responsible for realizing and describing learning situations and nursing and cooperation challenges which are present at its institution.

Observation training

The purpose of observation training is for the student to experience different and important parts of nursing services. Observation training is short periods of practical training which are normally not subject to evaluation. The student's experiences will lead to an incomplete operational competence, which may be developed by training and further education into an operational competence.

All students must have experience with patients in preventive health services and in prenatal and postnatal care. The college determines whether the training takes place in specialist services or in municipal health services. All students must also have experience from surgical wards, intensive care units and outpatient clinics.

Learning practical nursing skills

Practical nursing skills are learnt through practical training and experience. Nursing skills cannot be taught by an academic approach only, but require practice based on attitudes to nursing as a profession and the learning environment. The acquirement of this type of practical knowledge presupposes the availability of clinically experienced people who are able to demonstrate skills and correct mistakes, and that the student can practice practical skills in interaction with patients and other students. Learning practical skills implies that the student practices and reflects upon important skills required in professional nursing. The students come close when they practice their skills on one another. It is important to make use of this closeness in the learning process, in order for the student to learn about her or himself and gain experience of other people's reactions in relation to the body, to physical contact and interaction. The training of practical skills may take place at the training unit at the college itself or in connection with practical training periods outside the college. The areas and aims of learning practical skills must be regarded in relation to the learning of the total nursing competence, and these must be described in the college's curriculum guidelines. The college is responsible for developing training and study methods which ensure that the students gain operational competence in basic skills. Practice and training at training units, in demonstration rooms, and by interactive computer and video equipment may be highly educational and may contribute to simulate realistic exercises. These types of simultaneous learning presuppose training in groups of maximum 10-15 students, and a supervisor with educational and clinical competence. The college is responsible for the availability of relevant equipment.

Evaluation of practical training

Cf. §50, No 1 and 2 in the Universities and Colleges Act No 22 of 12 May 1995. Also cf. § 4 in the regulations. Evaluation is a continuous and obligatory part of the supervised practical training, cf. 11.3.

The College Board specifies the aims of each period in the curriculum guidelines, and lays down criteria which must be satisfied in order to pass the practical training. At the end of every period of supervised practical training there must be an evaluation in agreement with the aims of the training. At the final evaluation there must be two other persons than the student present: one teacher from the college and one supervisor from the institution where the practical training has taken place. In case of doubt, the teacher's evaluation will be decisive.

An evaluation of the student's practical nursing skills must be based on a total evaluation of the student's ability to practice as a nurse. In the evaluation of the practical training the marks *pass* and *fail* will be used.

ANNEX 3

Some illustrative texts used for the learning and teaching of nursing

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Denmark

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Germany

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   ARETS, J. *et al.* 1999: *Professionelle Pflege 1. Theoretische und praktische Grundlagen.* Hans Huber Verlag: Bern u.a.
   ARETS, J. *et al.* 1999: *Professionelle Pflege 2. Fähigkeiten und Fertigkeiten.* Hans Huber Verlag: Bern u.a.
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4

Quality enhancement

QUALITY ENHANCEMENT AT PROGRAMME LEVEL: THE TUNING APPROACH

1. **Introduction**

The Tuning project recognises the growing interest in *quality* in higher education all over Europe. There is a growth in the number of quality units at institutional level looking at internal quality as well as an increase in newly created quality agencies evaluating quality from the perspective of external agents. Furthermore, there is a firm belief among the relevant players that quality is at the heart of the construction of the European Higher Education Area. This is reflected in the ENQA policy paper *Standards and Guidelines for Quality Assurance in the European Higher Education Area* which has been endorsed by EUA, EURASHE and ESIB and approved at the Bergen summit by the European ministers of education.

The term «quality» in higher education is often ambiguous. It is commonly used as a kind of short hand, to represent different understandings of what the essential components of quality are, and what the best methods of creating or guaranteeing their existence might be. Tuning keeps in mind that the general objective of the entire higher education sector must be to create, enhance and guarantee the best and most appropriate experience of higher education possible for the student. Different strategies and various actors, working at different levels of the process certainly must be involved in the process of guaranteeing that quality in this general sense is achieved. However Tuning members believe that in final analysis the responsibility for developing, maintaining and increasing quality in higher education lies with Universities and their staff, with the contribution of students and other stakeholders. Other actors and levels have important roles in stimulating and in checking achievement, but if academic staff and students are not deeply, sincerely and intelligently involved in developing and enhancing quality, outside agents will be able register the existence of problems, but they will not be able themselves to create and implement quality programmes.

Tuning's specific task is to create common understanding and appropriate tools for Universities to develop, maintain and improve quality in higher education programmes in the broad European context. In this chapter we will concentrate on what we see as the most important strategy towards building mutual trust and understanding, as well as ensuring recognition of qualifications and periods of study, that is, developing quality at the level of study programmes.

In the Bologna context any programme should be of relevance for society, lead to employment, prepare for citizenship, be recognized by academia and sufficiently transparent and comparible to facilitate mobility and recognition. Furthermore, it should be understood, valued by and thought to be sufficiently attractive to appeal to significant numbers of good students, either in a national and/or an international context. The adequacy of the approach to achieve the objectives, consistency and coherence of the constituent elements of the programme are further proofs of its quality.

The Tuning project has provided a foundation for quality enhancement by developing appropriate transparency tools and a dialogue with stakeholders. The creation of an environment where more than 135 acknowledged European experts from nine different subject areas have been able to work together constructively, has allowed them to reach points of understanding and convergence; they have been able to reflect jointly on the meaning of quality, and respond to its growing importance in the higher education sector, offering guidance especially for the design, implementation and delivery of curricula.

Among the various criteria used in judging quality, we find the terms «fitness **for** purpose» and «fitness **of** purpose». The former, often used in quality assurance activities, means determining whether the academic strategies are suitable for achieving the declared aims of a programme. The latter means determining whether the aims of the programme are suitable or not. In the Tuning view, to develop true quality, «fitness for purpose» has meaning only when the fitness of purpose itself is thoroughly established and demonstrated. As a consequence Tuning holds that quality in programme design and delivery means guaranteeing both «fitness for purpose» (i.e. suitability for achieving the declared aims of each programme), and «fitness of purpose» (i.e. suitability of the aims of each programme: these should meet the expectations of students, academic staff, employers and the broader ones foreseen in the Bologna Process). Guaranteeing «fitness of purpose» requires a strong connection with research and academic standards as well as a consideration of employability which is only implicit in the «fitness for purpose» definition.

Tuning sees its particular role as that of encouraging *quality enhancement* at programme level and providing tools to develop it. As a working definition for Tuning, *quality enhancement* means *a constant effort to improve quality of programme design, implementation and delivery». The Tuning approach is based on a set of consistent features:*

- *an identified and agreed need;*
- *a well described profile;*
- *corresponding learning outcomes phrased in terms of competence;*
- *the correct allocation of ECTS credits to the units of the programme;*
- *appropriate approaches to teaching, learning and assessment.*

All this delineates and depends on establishing an on-going process based on built-in quality enhancement mechanisms and an awareness of its importance, that is, a «quality culture».

2. **Tuning methodology**

The Tuning project has drawn attention to the importance of competences as the basis for the design, implementation and delivery of study programmes. The concept of competences implies the use of learning outcomes as well as credits, preferably ECTS credits, as guiding principles. Tuning distinguishes subject specific competences and generic competences. According to the Tuning methodology learning outcomes should be expressed in terms of competences. Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of learning. They can refer to a single course unit or module or else to a period of studies, for example, a first or a second cycle programme. Learning outcomes specify the requirements for award of credit. Learning outcomes are formulated by academic staff. Competences represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering competences is the object of educational programmes. Competences are formed in various course units and assessed at different stages. Competences are obtained by the student. Competences can be developed by the student to a higher (or lower) degree than expected by the learning outcomes. The level to which competences are obtained is expressed in a mark or a grade.

Study programmes which have been set up according to the Tuning methodology are output- oriented and, preferably, modularized. A modular system has the advantage of being transparent. It will promote and facilitate finding of a correct balance between learning outcomes and their related student workload expressed in ECTS credits.

For Tuning the design of a programme is a decisive element for its quality and its relevance for society. Badly designed programmes will not only have a negative effect on the output of the number of successful students and the average time to finish the programme, but also on the level of citizenship and employability of its graduates.

As part of the first phase of the project, Tuning developed a step by step approach for designing a study programme[28]. This model identifies the following key elements:

— Necessary resources must be available;
— A need must be demonstrated and be established through a consultation process of relevant stakeholders;
— The degree profile must be well described;
— A set of desired learning outcomes have to be identified and expressed in terms of generic and subject specific competences;
— Academic content (knowledge, understanding, skills) and structure (modules and credits) must be estabished and described;
— Appropriate teaching, learning and assessment strategies to achieve the desired learning outcomes must be identified;
— An appropriate evaluation and quality assurance and enhancement system focussing in particular on the consistency and implementation of the curriculum as a whole must be set up.

It must be remembered that each programme is a unit with its own identity, defined aims and purpose. Therefore, quality indicators need to be built from within as a normal and substantial element, not in the sense that they should be standardised norms, but rather that they

[28] Julia González and Robert Wagenaar, eds., *Tuning Educational Structures. Final Report. Phase One* (Bilbao-Groningen, 2003, p. 51.

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should be criteria which respond to the uniqueness and coherency of the specific plan[29]:

In the framework of this paper it seems useful to discuss the elements listed above in greater detail:

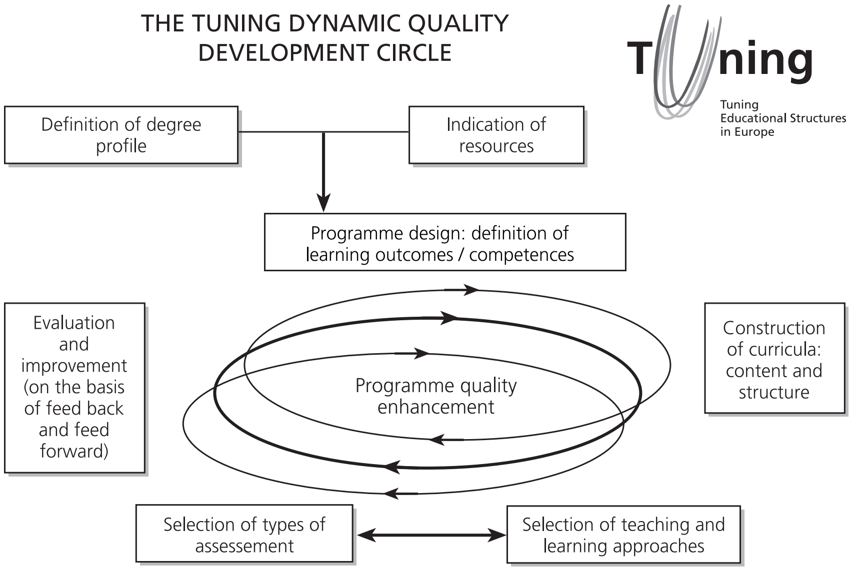
1. A pre-condition for delivering a programme is the availability of **resources**. The quality of these resources directly affects the quality of the programme. Resources include the availability and quality of academic staff, supporting staff and, in the case of workplace learning, the workplace supervisors. The environmental conditions and facilities available for teaching and research are also relevant. Both require permanent monitoring and improvement. In the case of academic staff this means for example that opportunities are made available and promoted for making staff aquainted with new approaches to learning and teaching.
2. To demonstrate the **need** for a degree programme a broad consultation process is required. This consultation process should not only include the academic community, but also professionals and professional bodies and employers and other stakeholders. To obtain useful information Tuning has developed a set of questionnaires focussing on generic as well as subject specific competences. The outcome of these questionnaires forms input for the definition of international reference points for a subject area. Other input comes from the (global) academic community of the specific field. This community has a decisive role in defining the academic reference points for this field. However, in the end it is the academic staff responsible for the programme, taking into account the identified reference points and the orientation and competences of available members of staff, which actually designs the programme. Although diversity of competences and orientation is necessary in order to have quality in departments, faculties and universities, there must also be coordinating structures which guarantee coherence and make **change** possible. Crucial in this respect are the so-called change agents, e.g. directors of studies, heads of departments, executive boards and councils etc., responsible for the design, approval, delivery and management of programmes. Changes

[29] JONES, W. Gareth (2003): Discussion Paper. Physic group. Imperial College, London, based on similar principles adopted in the IDEA League. See also: QAA, *Code of practice for the assurance of academic quality and standards in higher education. Section 7: programme approval, monitoring and review* (London, May 2000).

are difficult to implement when they are not widely supported. Therefore, a broad spectrum of academic staff and students' views should be consulted so that the curriculum and educational approach is understood and supported by both staff and students.

3. For each study programme there should be a degree or qualifications **profile** that clearly defines the aims and purposes of the programme. Further clarity can be obtained by formulating these aims in the form of intended learning outcomes (statements of what the graduates should know, understand and be able to do), expressed in terms of the subject-specific and generic competences to be achieved. Curriculum design and student assessment should be coherent with this degree profile.
4. The curriculum design process should consider the **academic content** and **level** to be reached but it should also consider that one major goal in higher education is to promote autonomous learning and autonomous learners —which has implications for teaching and learning methods and the overall student **workload** in terms of ECTS credits. The curriculum should not overload students with excessive and redundant content. Curriculum design should consider the employability of graduates and the development of citizenship as well as their academic and intellectual training.
5. An **evaluation** scheme should be in place to monitor and review the operation of each study programme. The monitoring process should involve the systematic collection and analysis of statistical information on key indicators such as examination success rates, progression of students to employment or higher degrees, student recruitment numbers, response to evaluative questionnaires, feedback of partner institutions, etc. The results should be made known within the university. Various **feedback and feedforward loops** should be in operation. These should involve students, alumni and academic staff, operating on the same or different time-scales. In particular, there should be provision for obtaining and acting on information from student questionnaires and from student representatives. The purpose of the feedback loops is to correct deficiencies in delivery and/or design of the curriculum. The feedforward loops are intended to identify expected developments, which should be taken into account when improving and/or developing programmes. In the case of programmes incorporating workplace learning or professional competences, feedback should be obtained from the stakeholders involved as to the suitability in practice of the students' competences and hence their employability.

The above listed principles for setting-up and improvement of programmes have been visualized by Tuning in the *dynamic quality development circle*: already presented above, in the discussion of Tuning methodology in chapter 1.



This model is based on the assumption that programmes can and should be enhanced on the basis not only of feedback but also of feed forward by taking into account developments in society as well as the academic field concerned. This is illustrated by the progressive spiral loops in the diagram.

In order to facilitate institutions in programme design, implementation and delivery, Tuning has developed a comprehensive **List of key questions** to be considered in initiating or developing a degree programme.Its usefulness has already been validated in practice as is shown in the examples annexed to this paper. This tool is included in this paper as Annex 1

Because society is always changing and academic fields are developing, education has to be a dynamic process. Tuning is convinced that periodic external or internal quality assurance checks are insufficient for developing and maintaining true quality. The focus, rather, should be on the constant improvement and updating of the programme. It follows that the evaluation process(es) must be carried out in a particular way. Individual teaching and learning units / modules should not be assessed and evaluated by themselves, but rather in the framework of the overall programme.

A curriculum evaluation can be considered under three main headings:

— the educational process,
— the educational outcome and
— the means and facilities required for programme delivery.

Each of these main headings contains a number of elements to be considered:

— **Educational Process:**

- degree profile (aims of the educational programme),
- learning outcomes to be achieved and competences to be obtained,
- degree/educational programme structure and order of programme components to ensure progression,
- coherence of degree / educational programme,
- division of workload over the semester and the academic year,
- feasibility of programme (check),
- teaching, learning and assessment methods,
- connection with secondary education,
- international cooperation and student mobility.

— **Educational outcome:**

- study rate, cessation of study and switch-overs (output),
- output of 1st and 2nd cycle,
- employability.

— **Means and facilities required:**

- structural and technical facilities,
- staff and material means,
- student support: student counsellors.

The different elements identified above are proposed in a **Checklist for Curriculum Evaluation**. The checklist is based on 14 «premises» or statements which describe an ideal situation. In practice this ideal will be difficult to realize, but it is *the responsibility of academic staff* *and students* to come as close to it as possible. The Checklist is annexed to this chapter as Annex 2. It can be used in combination with the **List of Key Questions** included as Annex 1. Both should be seen as practical tools to help programme committees to design, implement, deliver, monitor and enhance study programmes.

3. Tuning's further role in quality enhancement

Besides offering methodological frameworks and practical tools for the design, implementation and delivery of study programmes, Tuning has a further role in that it is a pan-European network of academics. The potential role of networks with regard to the issue of quality is mentioned in the Berlin Communiqué. Tuning is a network of academics representing both European countries and their own institutions, which formally selected them for the project. The key role of academics within institutions is stressed in the Trends III report, where it is said:

> «If the enormous potential of using the Bologna objectives as a trigger for long-needed, fundamental and sustainable reforms of higher education in Europe is not to be wasted, the voice of the academics, within the institutions, will need to be heard and listened to more directly in the Bologna Process».[30]

Networks of academics can significantly contribute to the appreciation of the value of quality as well as to the elaboration of concepts in terms that are meaningful in different cultural contexts. This, in relation with quality, is a great asset, as the creation of shared meanings can contribute greatly to the development of a quality-oriented European Higher Education Area. Networks can also have an effective role in the dissemination and socialization of these concepts.

The Tuning project works in a European, transnational context, where recognition is one of the central issues. Recognition based on comparability and transparency is at the core of the Tuning project. A basic task of Tuning is to provide useful reference points for creating comparable, readable, programmes based on degree profiles described in a language of learning outcomes. Learning outcomes are expressed in terms of generic and subject-specific competences, with a clear

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[30] «Trends III, Conclusions» (*op. cit.*).

definition of level and a well-focused teaching, learning and assessment approach. This is a significant step forward along the path towards recognition, as it provides a basis on which to:

- —Formulate reference points based on internationally shared concepts and contents regarding what constitutes each subject area in the broad sense, distinguishing specializations and study programmes based on mapping;
- —Develop mutually shared criteria and methodologies regarding quality assurance at programme level;
- —Offer elements of comparability at national and international level;
- —Build trust in internal evaluation systems that are mutually understood and jointly built;
- —Enhance interest for recognition procedures at programme level within the institutions.;
- —Facilitate ENICS and NARICS in their work of recognizing the degrees;
- —Use available resources effectively to develop systems of reference and data keeping which can be compared and understood in the different countries.

As a transnational network, Tuning provides a unique platform for implementing the *principles* which have already been identified as *underpinning quality in European higher education*:

Relevance. In a student-centred educational system obviously a key value for any degree programme is its relevance for students as well as society. A programme should be based on academic, professional and social development, intellectual endeavour, employment and citizenship in an European environment. Being competence-based, the Tuning approach facilitates dialogue with employers and social actors. It pursues the identification of relevant academic and professional profiles and demands clarity about the needs that degree programmes intend to meet.

Comparability and compatibility. Using the Tuning methodology European degree programmes can be designed as compatible and comparable with other European programmes, through the use of common reference points, jointly agreed and expressed in generic and subject related competences. This methodology allows for true comparability, while showing a clear respect for the diversity of curricula, paths of learning and culturall ethos. The inclusion and development of ECTS also provides higher levels of comparability and compatibility through the use of student workload as a tool for planning and monitoring whole degree programmes as well as their component parts.

Transparency. This is a necessary characteristic of any study programme and must be built into it from the beginning. There must be transparency in the outcomes, in the process, in the learning resources, in the quality systems and in data maintenance. Transparency is connected to readability, requiring the use of a language which can be understood by students, employers and other stakeholders alike in a transnational society. Transparency includes a correct use of ECTS credits for defining student workload and of the Diploma Supplement as well as of the other ECTS tools.

Mobility and transnational education. The creation of the European Higher Education Area requires a reliable and high quality mobility system. In turn, the experience of mobility contributes greatly to the full development of a strong and vital European Higher Education Area. Physical mobility, for well-structured periods of study as well as for complete degree programmes, increases quality with respect to the European dimension of education, the capacity for professional employment in the European labour market and European citizenship. Transnational education is a powerful force for bringing institutions together and for developing common quality enhancement mechanisms.

A high quality system of mobility must guarantee full recognition of periods of studies and degrees, as well as appropriateness for the student of the activities undertaken at a host institution. ECTS is the key system on which to build recognition. Tuning has facilitated recognition by fully developing the ECTS accumulation function, through the consistent use of learning outcomes, expressed in terms of competences, as well as workload.

Attractiveness. In a European education area which seeks to be attractive to third countries quality must be guaranteed. The quality mechanisms developed at the national level by the different countries must be combined and further developed in order to be perceived and understood as a European system. The Tuning project provides a quality enhancing methodology for designing degree profiles and developing curricula, including those for joint degrees, formulating learning outcomes and competence and measuring student workload. It already provides a common language for the teaching, learning and assessment of competences, which will be further developed to include quality indicators.

Universities are creating their own methods and systems for the development of an internal quality culture. They need to monitor the start-up and the development of their academic activities and programmes in a way which is coherent with core academic values and with their specific mission.[31] Tuning provides an approach for designing or redesigning and developing study programmes according to the tenets of the Bologna process.

The general results of Tuning provide useful input for all Higher Education institutions, while the results regarding subject areas offer specific European reference points which can be used for quality enhancement at disciplinary level.

The subject area/disciplinary level is the appropriate context for:

- —using the experience of academics representing different educational traditions;
- —requesting the views of professional bodies and other related stakeholders in each field, thus maintaining a dynamic dialogue about social relevance and adequacy;
- —focussing on developments in each subject area, thus developing a dynamic approach to thresholds and reference points;
- —relating courses and degrees to maps of professions and academic and professional profiles in an international context;
- —promoting a shared vision of quality development within a subject area while recognising and respecting the diversity of the approaches being used;
- —comparing curricula and approaches to learning, teaching and assessment, in order to map the areas, facilitate mutual understanding, identify core competences and common standards at the different levels;
- —encouraging employability studies at the European level with an emphasis on diversity and innovation;
- —contributing significantly to the development of cycle(level) descriptors used in the construction of national and European Frameworks of Qualifications.

It is within a subject-area that the level of academic development of a programme can be best understood and measured in terms of quantity as well as quality.

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[31] SURSOCK, Andrée, «Reflection from the Higher Education Institutions Point of View. Accreditation and quality Culture on the European Dimension of Quality», *Working on the European Dimension of Quality. Report of the conference on quality assurance in higher education as part of the Bologna process Amsterdam, 12-13 March 2002*, eds. by Don F. WESTERHEIJDEN and Marlies LEEGWATER, Zoetermeer, 2003.

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4. **Some practical tools and examples of good practice**

In this chapter, the importance of the development of a quality culture at programme level is stressed, focussing on design, implementation and delivery. Different elements around which such a culture have been identified. Special attention is given to the role of Tuning in this respect. Two practical tools, already been mentioned above and annexed to this paper: will be useful in the process of designing or redesigning, improving and evaluating curricula. These are the *Tuning List of Key Questions* (Annex 1) meant as a basic tool for programme design, delivery, maintenance, monitoring and improvement in a national as well as an international setting. Annex 2 offers a *Tuning Checklist for Evaluating Curricula*. A third annex offers five examples of good practice, showing how the Tuning approach or a number of its elements can be and have been used in practice. The first three examples show how the Tuning approach can be used to (re)design study programmes according to the Bologna three cycle system at institutional and faculty level as well as at the level of a department and a study programme. The last two examples focus on the evaluation process. What all have in common is the objective to enhance the quality of study programmes in a coherent and transparent way.

The first example is that of Groningen University, in particular the Faculty of Arts, where in a systematic way a large number of study programmes have been re-designed according to the basic assumptions of the Bologna three cycle structure by using the Tuning approach. It offers —in more general terms— an overview of the steps that have been made during the process of redesigning, planning and implementing the new bachelor and master programmes. As a follow-up of the reform process the Faculty of Arts developed its own Tuning based internal quality culture system which became operational in the Spring of 2005.

The second example, presented by the Department of History of the University of Coimbra shows, at departmental level the usefulness of the Tuning methodology for re-defining a study programme (History in this case), on the basis of a profile and related learning outcomes. It also makes clear the relevance of this approach for assuring programme quality.

The third example gives an overview of the principles underlying university degree programme design and quality management as developed and used in the Physics Department of Imperial College London, which were subsequently adopted and enhanced by the IDEA League. These principles are fully in accordance with the Tuning approach concerning curriculum design, delivery and enhancement.

The fourth example, developed by the University of Helsinki, offers a methodology for the enhancement of the quality of study programmes on the basis of an evaluation matrix. The matrix focusses on eight areas of quality or results: teaching and research, teaching goals, leadership of teaching, teaching, learning results (including assessment), resources, feedback and follow and postgraduate studies. It distinguishes four levels of quality: only satisfactory, needs developing, good and excellent.

The University of Deusto offers the fifth example of good practice. This example shows how in a systematic way competences can be evaluated. The generic competence «teamwork» has been chosen as an example of this approach.

5. Using Tuning to enhance quality in programme design and delivery

To sum up, Tuning offers powerful tools for enhancing quality in programme design and delivery. Of course, quality is also affected by elements depending on national, local or institutional contexts. Nonetheless Tuning findings and Tuning tools can be used by institutions and their staff everywhere to manage programme development in the Bologna context in an effective way that fosters learner-centred cultures.

Tuning provides an overall framework for developing student-centred degree programmes. It shows how to design programmes with full consideration the final result —that is, how the graduate will be equipped for life in the real world after completing the learning process— while keeping in mind professional and personal development as well as citizenship. It also makes it possible to describe programmes by using a language that is understood in the same way across Europe and beyond, thus ensuring comparability, transparency and attractiveness.

In fact, Tuning's starting point is to design programmes which can achieve meaningful learning outcomes within a given time framework. Learning outcomes are not formulated in terms of disciplinary contents but rather in terms of knowledge and abilities acquired. Such knowledge and abilities are expressed and conceptualised as subject specific and generic competences, that is, what a student will know and be able to do at the end of a given learning process.

The Tuning competence-based approach makes it possible to consult stakeholders, including students, and to describe in clear language what the specific goals of each programme are. These «goals» constitute the degree profile, which is connected to the professional role the graduate is expected to carry out and to the academic standards s/he is expected to achieve in the subject area. By using workload-based credits, learning and teaching activities can be organized in a consistent and efficient way.

Any degree programme must develop subject specific competences, that is, knowledge, skills, abilities and values, specifically needed for the subject area(s). Tuning already provides discipline-based reference points for subject specific competences in many subject areas: it has established an approach and a common language through which similar tools are being developed for the remaining subject areas.

Each of the subject areas already involved in Tuning has also defined the level to which the various competences must be developed in a first or a second cycle degree. These are general descriptions which can be used for reference in any institution or in any country, while respecting any national or local academic tradition and any cultural, economic or social consideration. In the future, Tuning expects to produce cycle-level descriptors for the third or doctoral cycle as well.

Particularly novel in Tuning is the focus on «generic competences», which until now have not been explicitly taken into account in most academic programmes. For each programme choices will be made about which generic competences are most relevant for its graduates and appropriate learning/teaching/assessment activities will be organised on that basis. Tuning not only provides a common language for defining generic competences; it also furnishes many concrete examples from a wide variety of subject areas on how to foster and enhance them.

Naturally, in planning learning and teaching activities to achieve the intended learning outcomes, institutions must be constantly aware of the time framework established. Workload-based ECTS credits make it possible to plan activities effectively as they take into account all the time that must be dedicated to learning, teaching and assessment activities and hence provide a crucial tool for effective programming.

ECTS credits are only one of the Tuning tools for creating environments in which the necessary learning outcomes can be achieved. Each country, each discipline and even each institution has its own teaching/learning and assessment tradition. Tuning has put these traditions into contact: by sharing knowledge and experience, a wide range of effective methods and techniques for forming individual competences has been gathered and described. This material concerns both subject specific and generic competences and comes from many subject areas. It is available for institutions to use, in order to develop their own approaches. Tuning findings indicate that using a variety of approaches to learning and teaching in each programme gives the best results.

Assessment should be the crucial tool for understanding whether a degree programme is successful. It should be based on ascertaining whether the learner has actually achieved the planned goals. Since these are formulated in terms of learning outcomes expressed in competences, assessment must be conceptualised and organised in such a way as to evaluate to what extent those competences have been achieved.

Again Tuning has gathered and elaborated examples of good practice coming from a variety of countries and subject areas. These are available for institutions and can be utilised to design assessment methods suitable to a competence-based approach.

Naturally, programme design and delivery must be continually monitored and evaluated to find out whether the aims are actually being achieved and whether they continue to be appropriate or should take into account changes and developments in the subject areas and in society. An increasingly important element will be changes and development in each subject area in the pan-European context. The Tuning tools and approach will allow institutions to monitor, evaluate and improve both their own programmes and their joint and international degree programmes in this broader context. Thus Tuning provides a path for quality enhancement at programme level.

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Annex 1

TUNING List of Key Questions for Programme Design and Programme Delivery, Maintenance and Evaluation in the Framework of the Bologna Reform

Programme design

Items	Key questions
Degree profile	—Has the **need for and the potential** of the (new) degree programme been established comprehensively fully and clearly? —Does it aim to satisfy established or new professional and/or social demands? —Was there a **consultation** with stakeholders? Did they identify the need for the degree programme? —Was the **approach** used for the **consultation adequate**? Were the groups selected the relevant ones for the degree programme considered? —Are the **definition** of the profile, the identification of the **target groups** to be addressed and its place in the national and international setting **clear**? —Is there convincing evidence that the profile will be **recognized** in terms of **future employment**? Is it related to a specific professional or social context? —Is this profile **academically challenging** for staff and students? —Is there **awareness of the educational context** in which the programme is offered?
Learning outcomes	—Have **clear and adequate learning outcomes** been identified at the level of the programme as a whole and of each of its components? —Will they result in **the profile** identified? Are they adequately distributed over the various parts of the programme? —Is the **progression and coherence** of the programme and its units sufficiently guaranteed? —Are the learning outcomes **formulated in terms of subject-specific and generic competences** covering knowledge, understanding, skills, abilities and values? —What guarantee is there that the learning outcomes will be **recognized and understood** within and outside Europe?

Items	***Key questions***
Competences	—Are the **competences** to be obtained by the student clearly **identified and formulated**, both subject-specific and generic? —Is the **level** of the competences to be obtained appropriate for this specific degree programme? —Are the competences to be gained expressed in such a way that they can actually **be measured**? —Is **progression guaranteed** in the development of the competences? —Can the competences obtained be assessed adequately? Is the **methodology of assessment** of the competences clearly specified and suitable for the **expressed learning outcomes**? —Are the approaches chosen for **learning and teaching** the competences clearly **specified**? What evidence is there to assure that the results will reached? —Are the approaches chosen sufficiently **varied and innovative / creative**? —Are the competences identified **comparable and compatible** with the **European reference points** relative to the subject area? (if applicable)
Level	—Has the **entrance level** of potential students been taken into consideration when identifying their learning needs? —Does the level of learning outcomes and competences correspond to the **level(s)** of the degree (cycle) foreseen in the **European and National Qualification Framework**? —If sublevels are included, are these described in terms of learning outcomes expressed in competences? —Are levels described in terms of: • acquiring knowledge, understanding, skills and abilities • applying knowledge, understanding, skills and abilities in practice • making informed judgments and choices • communicating knowledge and understanding • capacities to continue learning

Items	*Key questions*
Credits and Workload	—Is the degree programme **ECTS based**? Is it in alignment with the **ECTS key features**? —Have **credits** been allocated to the programme? How is the adequacy of this **allocation** guaranteed? —How are credits related to the **learning outcomes** of this programme? —How is the **correlation** between **workload and credit** allocation checked? —How is a **balanced** student **workload** guaranteed during each learning period in terms of learning, teaching and assessment activities? —What mechanisms are used for **revision** of credit allocation and learning, teaching and assessment activities? How are the students involved in this process? —Is **information** on the programme (modules and/or course units) presented as described in the **ECTS Users' Guide**? —How is **student mobility** facilitated in the programme? —How are **students advised** about mobility? —How are the **key documents of ECTS** used for mobility? —Who is responsible for **recognition** and which are the procedures used?
Resources	—How is the **formal acceptance** of the programme and the resources required to deliver it, guaranteed? —Is the **staffing** (academic and supporting staff and workplace supervisors) for delivering the programme guaranteed? Does the programme require the use of teaching staff from outside the department/institution? —Is **staff development** foreseen in terms of (new) approaches to learning, teaching and assessment? —How are the necessary **structural, financial and technical means** (class rooms, equipment, health and safety procedures etc.) guaranteed? In the case of workplace learning/placements, are there sufficient and suitable **placements** guaranteed?

Programme delivery, maintenance and evaluation

Monitoring	—How is **the quality of delivery** of the programme and its components monitored? —How is **staff quality and motivation** for the delivery of the programme monitored? —Are there systems in place to **evaluate** the quality of the learning environment in **workplace learning/ placements**? —Is the **quality of class rooms and the equipment** (including workplace environments) required to deliver the programme sufficient? —How is the **entrance level** of potential students monitored? —How is **student performance** monitored in terms of quality of learning outcomes to be obtained / competences to be achieved and time required to complete the programme and its components? —In what way is the **employability** of graduates monitored? —How is the **alumni database** organized? —Are data collected on the **graduates' satisfaction** with the programme?
Updating	—How is the system for **updating / revision** of the degree programme organized? —In what way can changes related to **external developments** in society be incorporated in the programme? —How is **staff development** related to programme updating organized and guaranteed?
Sustainability and responsibility	—How is the **sustainability** of the programme guaranteed? —How is it guaranteed that the relevant bodies take **responsibility for sustaining and updating** of the programme?
Organisation and Information	—How is the **updating of information** regarding the degree programme organized and guaranteed? —How is the adequacy of the system of **student support, advising and tutoring** ensured? —Is a **Diploma Supplement** issued to the students automatically and without charge in a widely spoken European language?

ANNEX 2
TUNING Checklist for Curriculum Evaluation

The following elements can be distinguished within the framework of curriculum evaluation: the educational process, the educational outcome and the means and facilities required for programme delivery.

Educational Process:

—degree profile (aims educational programme);
—learning outcomes and competences to be achieved;
—degree/educational programme build-up and order of programme components (to realize progression);
—coherence of degree / educational programme;
—division of workload over the semester and academic year;
—feasibility of programme;
—teaching, learning and assessment methods;
—connection of secondary and higher education;
—international cooperation and student mobility.

Educational product / outcome:

—study rate, cessation of study and switch-overs (output);
—output of 1st and 2nd cycle;
—employability.

Means and facilities required:

—structural and technical facilities;
—staff and material means;
—student support: student counsellors.

EDUCATIONAL PROCESS

1. **Degree / programme profile**

Premises:

The degree programme has a clearly defined profile which is based on the demands set by an academic degree on the one hand, and by the needs of society on the other hand by taking the future labour-market of graduates (of that particular programme) into consideration.

Questions:

To what extent do the available data show that the programme profile meets the demands set to it? If necessary, which adjustments are thought to be desirable?

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2. **Learning outcomes and competences at programme level**

Premises:

The degree programme has clearly defined learning outcomes that reflect the programme profile. The learning outcomes are described in terms of competences to be attained by the students (knowledge, understanding and skills).

Questions:

To what extent do the learning outcomes and competences to be attained by the students correspond with the programme profile? If necessary, which adjustments are thought to be desirable?

3. **Learning outcomes and competences of the (separate) programme components**

Premises:

For each degree programme component a total of about five learning outcomes has been formulated, which clearly contribute to realizing the learning outcomes at programme level. The learning outcomes are described in terms of competences to be attained (knowledge, understanding and skills)

Questions:

Are the learning outcomes (explicitly) mentioned in the course syllabus of each programme component (module or course unit), and explained further when required? To what extent is it clear from the descriptions that specific competences are practised? Is indicated which level of the competences is aimed for.

4. **Curriculum set-up and the sequence of programme components / educational modules**

Premises:

The curriculum is structured in such a way that coherence is assured within the total programme, in the various phases of the programme, and the separate programme components, and continuous progression is made with regard to the generic and subject-specific competences that have to be attained in terms of knowledge, understanding and skills.

Questions:

To what extent is it clear in practice that the programme is structured in such a way that coherence is assured and that progression is made with regard to knowledge, understanding and skills in relation to the learning outcomes and competences to be attained? If necessary, which adjustments are thought to be desirable?

5. **(Division of) workload**

Premises:

The programme is structured in such a way that a well-balanced division of the total workload is realized for the programme as a whole, for and within the separate academic years, and for and within both semesters. The calculated workload per programme component must correspond with the time that a typical student needs to attain the required learning outcomes.

Questions:

To what extent is it shown in practice that the total workload is divided according to the premises in the above? If necessary, which adjustments are thought to be desirable?

6. **Feasibility of degree programme**

Premises:

The programme is set up in such a way that it is feasible for a typical student (to complete the programme within the given time frame). This implies a good mixture of teaching, learning and assessment methods, no unnecessary impediments between programme components, and sufficient supervision/tutoring by the teaching staff.

Questions:

To what extent are guaranteed that a well-balanced combination of teaching and learning and assessment methods is applied, sufficient supervision by teaching staff is available, and entrance requirements for programme components are only required when a motivation with regard to educational content can be given? If necessary, which adjustments are thought to be desirable?

7. **Teaching, learning and assessment methods**

Premises:

The teaching, learning and assessment methods used are varied and have been chosen because they are particularly well-suited to achieving the formulated learning outcomes and competences.

Questions:

To what extent does the available information, in particular the educational and assessment regulations and course syllabi, assure that the formulated premises are being met? If necessary, which adjustments are thought to be desirable?

8. **Connection of secondary and higher education**

Premises:

The programme has been set up so that it takes into consideration the entrance level of students. For first cycle programmes it concerns the connection to secondary education, and for second cycle programmes it concerns the connection to first cycle programmes (that give entrance to the second cycle programmes).

Questions:

To what extent is made certain that the programme is set up in such a way that a good transition is provided with regard to entrance qualifications for first and second cycle? If necessary, which adjustments are thought to be desirable?

9. **International cooperation**

Premises:

There is structural cooperation with foreign partner institutions. This cooperation can be joint degree programmes and/or facilitating student exchanges and recognizing the academic achievements undertaken at the partner institutions.

Questions:

In what way is it guaranteed that students do not get behind schedule if they take part of their programme at a foreign partner institution, except when they are responsible for it themselves (e.g. because they have changed their programme without consultation, or because they have not completed programme components successfully). If necessary, which adjustments are thought to be desirable?

EDUCATIONAL PRODUCT

10. **(Realized) output of 1st or 2nd cycle**

Premises:

The Faculty/School aims to achieve the following aims: successful completion of the first year of study xx% (maximum two years after starting the programme), completion of a first cycle degree based on a completed first year xx% (four years after starting the educational programme), completion of a second cycle degree xx% (two or three years after starting the educational programme).

Questions:

Does the programme realize the set percentages? If not, why? Which suggestions are made in that case to bring about improvement?

11. **Employability**

Premises:

The degree programme meets a need in society as can be concluded from the fact that the transition to the labour market in a broad sense is good.

Question:

Do graduates find (suitable) employment within a reasonable period of time that fits the profile and level of the degree programme?

REQUIRED FACILITIES AND MEANS

12. **Structural and technical facilities**

Premises:

Sufficient structural and technical facilities and provisions are available for the delivery of the degree programme.

Question:

Are any bottlenecks apparent in practice in the delivery of the programme with regard to facilities and provisions?

13. **Material and personnel means**

Premises:

For the delivery of the programme sufficient quantitative and qualitative personnel means are made available in terms of teaching and supporting (administrative and technical) staff. Each programme / organizational unit has sufficient means for the delivery of the programme (guest lecturers, materials etc.)

Question:

To what extent are the assigned means sufficient in practice to deliver the programme according to its original premises and set-up?

14. **Student support, advising and tutoring**

Premises:

A system for student support, student advising and tutoring is available to students.

Question:

In what way is the demand/need met for an adequate system of student support, advising and tutoring?

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ANNEX 3
Examples of Good Practice

1. University of Groningen: Faculty of Arts

At the Faculty of Arts of the University of Groningen in the Netherlands the shift from single four year degree programmes to two-cycle programmes was based on the Tuning approach. For the design of 19 bachelor and 25 master programmes special committees were established, which obtained the task to develop detailed proposals. These committees received a set of guidelines to follow. In these guidelines the concept to be applied was explained in detail. This was necessary because a change was made not only to a two-cycle sytem, but also from a semester to a trimester system, from a staff oriented to a student-centred approach; a modularized system and a major-minor system was also introduced. Detailed information was given about cycle descriptors and intermediate level descriptors to be used as one of the basic elements in the design of the programmes as well as information regarding a step-by-step approach to follow and ways to calculate student workload.

As a first step the committees were asked to identify the profile of each of the programmes and translate these into learning outcomes expressed in subject specific competences (knowledge and technical skills) and generic competences. The profiles and the accompanying learning outcomes at programme level were checked by the responsible authorities before the next step could be made: the conversion of these outcomes into modules. For each of the modules it was asked to identify the competences to be formed. These had to be visualized in a grid, which was supposed to show that not only all learning outcomes were covered, but also that progress was guaranteed with regard to the learning outcomes to be achieved and the competences to be obtained during the programme. Before individual staff members were asked to design the course units in terms of teaching, learning and assessment approaches, the overall design of the degree programmes was assessed and, if required, adjusted.

The design of the course units again was based on the concept of learning outcomes and competences taking into account the number of ECTS-credits allocated to each of the modules and their accompanying student workload. The process described above took place from spring 2001 until the winter of 2002/2003. In September 2003 all existing programmes were replaced completely by the new programmes. For current students transitional arrangements were made. In 2004 the benefit of the approach used was proven when the external review of programmes had to be prepared. It proved relatively simple to prepare the self evaluation reports because most of the material and information required to answer the questions was already available. In this respect, it was also very valuable that the programme design committees had been asked to base their programmes on national and international reference points. As a follow-up of the reform as well as the external evaluation of its degree programmes, the Faculty of Arts developed its own internal quality culture system which became operational in the spring of 2005. This system is based on the approach presented in this paper.

2. **University of Coimbra: Department of History**

The History degrees of the University of Coimbra underwent little change from 1986 to 2000. The participation of the University in Tuning I in 2000 and in the TEEP-2002 pilot project in transnational evaluation, framed a curricular and quality assurance reform that started delivery in 2003. Procedures, tools and strategies had to be designed to make the Tuning approach operational and, most important, «quality assurance» friendly. What follows are some highlights of the Coimbra experience regarding curricular reform, profile, and handling subject specific and generic competences from an internal QA perspective.

Lesson one: Define the programme profile and programme level learning outcomes in a useful way

When trying to define the programme objectives we found it useful to distinguish two perspectives: the «profile» and the set of subject specific and generic competences that constitute the programme level learning outcomes. The «profile» is a description of what the graduates know and are able to do, written with the potential employer in mind. In Coimbra's case it is a five point statement that defines in very general terms the professional specificity and relevance of the graduates in History. Along with the profile a set of Tuning based 14 competences, 7 subject specific and 7 generic, was defined. These constitute the learning outcomes of the cycle of studies expressed in more academic terms. The profile and the 14 competences describe the same thing: what graduates know and are able to do. But the profile reaches out to society, while the competences' descriptions reach inwards into the detailed curriculum.

Lesson two: It is difficult, but essential to define a workable strategy for linking course level learning outcomes to programme level learning outcomes

One of the concerns of QA in a Tuning inspired framework is to find a way to ensure that the learning outcomes defined by staff at the course level contribute in a coherent way to global aims of the programme. In our experience this involved three steps.

Step 1: Ensure that the competences which constitute the programme level learning outcomes are clearly understood by everyone. We found it useful to have a short document (five pages) that provided a clarification for each of the global competences that constitute the programme learning outcomes, with examples of courses or activities related the competences.

Step 2: Design a way to link individual courses to the global competences. In our case, for subject specific competences the link was created at the level of curricular structure: each course contributes to one of the 7 specific competences that form the global learning outcomes of the programme. In this way the weight of the subject specific competences is known in terms of workload in the general curriculum: it is equal to the sum of the workload of the courses that are associated with them.

A similar simple scheme for the development of the generic competences defined in the programme level learning outcomes could not be found. The problem is that competences like «planning and project management» or «teamwork», are best developed in actual situations where students exercise and improve them, and not really by «studying» them. Activities capable to improve those competences can occur in almost any course, whatever the content, if the proper environment is created —in consequence global workload per generic competences is harder to compute. In this context a progressive approach was taken, aimed at committing the staff to the concept and practice of generic competence development and to create the basis of a monitoring process that would allow later assessment and development. It was required that each professor would select, from the list of generic competences in the programme learning outcomes, those that would be promoted in each of the courses under his or her responsibility. The professor's choice was then made public in the course description and registered in the programme information system, increasing the general awareness of the effort towards the development of generic competences and strengthening the teaching staff's responsibility in that area.

From the QA point of view the fact that each course is clearly linked to the global learning outcomes is very important: it provides criteria for assessing the adequacy of individual course syllabus and allows for high level aggregation of information originated by processes of monitoring of achievement and student feed-back. These are traditionally dealt with at the course level, but, in this framework, can be also analyzed at the competence level.

Step 3: Make explicit the link to the global specific and generic competences in the course descriptions. This will ensure that the new approach is visible to all the actors, and not just a behind the scenes organization scheme.

Lesson three: Academic information systems must become «Tuning aware» to effectively support QA

Coimbra learned the hard way that is very difficult to implement any reliable QA strategy without changing what is stored in the academic information systems. More specifically it is essential that competence lists and the links between courses and competences are entered in the system that produces the public description of the programme and that processes assessment results. Free form learning outcomes in course descriptions are necessary but not sufficient Monitoring procedures for achievement and progression must also be competence aware.

Conclusion: The Tuning methodology provides an essential contribution to QA strategies at the programme level

Most real difficulties in inducing the change that emanates from the Tuning approach are, of course, related to motivating staff and students to participate in the process in a positive way. We found that Tuning makes a huge difference at that elusive level, because it provides a top down approach that conceptually frames and, in a sense, legitimizes the QA effort. At the level of global profiles and learning outcomes it is easy to reach institutional consensus. From that root curricular design flows more easily, especially if the competences are clearly formulated and understood and a clear method of mapping of courses to them exists. The programme structure acquires a sense of order and purpose while a decade ago there it would have been little more than a list of courses. In this context quality assurance becomes a natural step, well grounded in high-level consensual decisions.

3. **Imperial College London: Physics Department**

Principles Underlying University Degree Programme Design and Quality Management as developed and used in the Physics Department of Imperial College Lond,on and subsequently adopted and enhanced by the IDEA League:

1. The general purposes and goals of each study programme should be stated and should take into account both the needs and expectations of students and also the academic character of the discipline. External influences and changes, both national and international, should be considered as well as the mission of the university.
2. For each study programme there should be a qualification profile that clearly defines the aims and objectives of the programme. Extra clarity can be obtained by expressing objectives in terms of the intended learning outcomes, i.e. statements of what the graduates should know, understand and be able to do, and also in terms of the general skills and wider competences to be achieved. Curriculum design and student assessment should refer to this qualification profile of the graduates. Ideally, each intended learning outcome should be assessed using a scale representing the degree to which it has been achieved.
3. Within an academic department, there should be a small group (e.g. a teaching committee) led by an experienced and senior academic (e.g. Director of Studies) that has the main responsibility for the design and management of the delivery of each study programme. Student views should be heard and considered in this group either directly or through an associated body with strong student representation. A broad spectrum of academic staff views should also be heard so that the

curriculum and educational approach is understood and supported by both staff and students.

4. The curriculum design process should consider the academic content and level to be reached but should also consider teaching and learning methods, and the overall workload placed on the students. So long as the objectives of the programme are met, the curriculum design should not overload students with excessive and redundant content. Curriculum design should consider the employability of graduates as well as their academic and intellectual development.
5. An evaluation scheme should exist to monitor and review the operation of each study programme. This should consider both educational quality and academic standards. The monitoring process should involve the systematic collection and analysis of statistical information on key indicators such as examination success rates, progression of students to employment or higher degrees, student recruitment numbers, response to evaluative questionnaires etc. The review process should be periodic and should involve experienced external subject experts as well as quality specialists from the same university. The results of the reviews should be published within the university.
6. Various feedback loops should operate. These should involve students, alumni and academic staff but may operate with different time-scales. In particular, there should be provision for obtaining and acting on information from student questionnaires and from student representatives. The purpose of the feedback loops is to correct deficiencies in delivery and/or design of the curriculum.
7. Since physics is a discipline with strong international research connections, the appointment of academic staff with a high international activity and standing in research is crucial to the aim of educating students in a research environment. Potential excellence in teaching ability should also be an important criterion in such appointments. Staff training in teaching techniques should be made available and promoted.

5. **University of Helsinki**

Teaching Evaluation Matrix

The evaluation matrix presented here was finalized in the Spring of 2004 and has been used successfully evaluate the quality and results of teaching during the period 2004-2006. The matrix distinguishes four levels of quality of outcome of the evaluation process: only satisfactory, needs developing, good and excellent.

It has to be kept in mind that the categorisations found in the «excellent» column are also found in the «good» column. The category of excellence is based on the same elements as that found in the «good» column; these elements have not been repeated in the last column.

The evaluation matrix has been compiled mainly from the point of view of the Department but, in places, the viewpoint of the Faculty, the programme, or the discipline may also be adopted. The matrix should be applied with flexibility, bearing in mind the differences between the various disciplines.

The evaluation is based on eight facets or areas including feedback and follow-up and postgraduate studies.

Area of Quality or Results

1. TEACHING AND RESEARCH
   - 1.1. Teaching, studies and research
   - 1.2. Pedagogical research as a support for teaching
2. TEACHING GOALS
   - 2.1. Teaching goals and core elements
   - 2.2. Student-centred teaching
3. LEADERSHIP OF TEACHING
   - 3.1. Teaching Strategy
   - 3.2. Quality control in teaching
   - 3.3. Educational planning
   - 3.4. Pedagogical merit in filling teaching posts
   - 3.5. Teaching development projects
   - 3.6. Internationalism
4. TEACHING
   - 4.1. Teaching methods
   - 4.2. Supervision of learning and individual feedback
   - 4.3. Study guidance and counselling
   - 4.4. Use of information technology in teaching
   - 4.5. Study material
   - 4.6. Contacts with the job market
5. LEARNING RESULTS
   - 5.1. Core syllabus
   - 5.2. Acquiring good learning strategies
   - 5.3. The exam system and learning evaluation
   - 5.4. Grading criteria
6. RESOURCES
   - 6.1. Human resources
   - 6.2. Pedagogical skills of teachers
   - 6.3. Premises and equipment
   - 6.4. Student recruitment

7. FEEDBACK AND FOLLOW-UP

   7.1. Student feedback
   7.2. Feedback from working life
   7.3. Employment

8. POSTGRADUATE STUDIES

   8.1. Recruitment and position of postgraduate students
   8.2. Supervision and teaching
   8.3. Schools for Advanced Studies and postgraduate cooperation
   8.4. Specialisation

SELF-ASSESSMENT FORM

STATISTICS

AREA OF QUALITY OR RESULTS	Only satisfactory quality and results	Quality and results need developing	Good quality and results	Excellent quality and outstanding results
1. TEACHING AND RESEARCH				
1.1. Teaching, studies and research	The teaching tradition at the Department is teacher-focused and textbook-reliant. Many feel it is not possible to apply a scholarly method and use the latest research findings as materials in basic-level teaching.	There are research-groups and/or individual teachers in the Department who combine their teaching with research-work.	The Department has made sure that, from the beginning of their studies, students are acquainted with the research done at the Department. Professors are involved already in first-year teaching. Introducing latest research is part of the teaching programmes. Teachers are encouraged to integrate their teaching with their own research and Department projects.	The teaching practices of a scholarly community are clearly understood at the Department: the students are seen as members of the scholarly community, and both teachers and researchers contribute in organizing the syllabus. The teachers see it as their task to acquaint the students with the latest research in their own field, and with new methodology in a larger area of research. Study, teaching and research are integrated during the whole course of the studies.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
1.2. Pedagogical research as a support for teaching	Research on university pedagogy is not known in the Department, nor is there any interest in applying it to teaching methods.	Individual teachers are acquainted with research, university pedagogy, and the latest innovations in the use of information technology in teaching. The Department allows this although it does not actively support it.	Teachers are encouraged to acquaint themselves with university pedagogical research and to apply the results in their own teaching. The Department is known for experimental teaching.	International university pedagogical research is used as a teaching development aid and as a methodological base in teaching. The practices which are found most useful are adopted. Many of the teachers in the Department actively review their own teaching and they report on their experiments both in Finland and abroad.
2. TEACHING GOALS				
2.1. Teaching goals and core elements	The goals and teaching plans are included in the study guides. They bear little relevance to the teaching plans of individual teachers. Both the teachers and the students are uncertain about how, and when, the goals could be implemented. What constitutes the core of the teaching has not been specified. The students cannot tell what is the core expertise essential for an expert in the field.	Teaching goals are discussed in the Department only when the whole degree structure or the syllabus are undergoing fundamental reforms. Then, the goals and roles of different sectors are agreed upon together. The teaching material is updated. An analysis of the core curriculum is known but no steps have been taken to implement it.	Teaching and goals are discussed and regularly followed up on at the Department. The demands of the work market have been taken into account when agreeing about learning goals. The Department has made an analysis of the teaching material for the core curriculum, and the syllabus is reformed accordingly. The syllabus makes a clear distinction between the core curriculum, compulsory to all, and the optional material. There is also room in the programme for supplementary studies.	Course contents and learning goals have been set so as to form a balanced whole, catering both to academic demands and working life. International research and results are used as reference material in the Department when deciding upon degree requirements. Both teachers and students know what the requirements are for the core curriculum, forming the essential core of expertise in the field. They also actively define and evaluate the core curriculum. The definition of a core curriculum is re-evaluated at regular intervals. This is done in accordance with feedback from the labour market and international developments.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
2.2. Student- centred teaching	The teaching plan does not take into account the skills and needs of students. The students have no observable influence on the studying methods or work or teaching methods. The syllabus offers very few optional elements or alternatives. The students are not offered flexible ways to study via the Internet.	Many teachers use methods which require active participation from the students. The students are given optional ways of fulfilling study requirements. Individual teachers give personal feedback to support the learning process.	The Department has adopted versatile teaching methods, and teachers are trained to use them. Student feedback is gathered throughout the syllabus and students are also given feedback on their learning. Individual study plans are in use and they are monitored in connection with supervision. The Department also offers students optional, Internet-based support instruction.	Student results and the quality of their learning is the measure of success in teaching used in the Department. Variation in individual types of learning are taken into account. In accordance with the principle of student-centred teaching the most important teaching goal is seen to be that the students learn through true understanding and acquire high quality expertise. The teaching and study methods, grading system and feedback mechanisms are in harmony with this principle. The students take part in the planning of goals and contents of teaching.
3. LEADERSHIP OF TEACHING				
3.1. Teaching Strategy	The Department is not acquainted with teaching strategies at University or Faculty level, nor does it have a perspective on it. It is unclear who is in charge of teaching guidelines, decision-making, and the division of tasks.	University and Faculty strategies are known and have been discussed, but the Department's views have not been taken note of. No decisions on departmental guidelines or adaptations have been made.	The Department has its own teaching strategy which is in harmony with the University and Faculty strategies. The Head of Department and the steering committee are active in carrying out the teaching strategies.	Department heads and steering committees are committed to carrying out the strategies and monitors their effects. The division of tasks among the teaching personnel and the channelling of resources is done in accordance with the strategic guidelines. The strategies are planned and carried out in cooperation with the entire teaching staff and students.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
3.2. Quality control in teaching	The quality of teaching is left to the integrity of the teacher; there is no quality control. There is no exact information on student progress or the quality of their learning.	The quality of teaching and student progress has been discussed, and individual teachers develop their teaching methods in accordance with this feedback. Student learning results and progress have occasionally been charted.	The Department has adopted a feedback system which takes into account both teaching and learning. The results are seen as a whole and they affect the planning and carrying out of teaching so that students can also see the effect. Also the advancement of studies and the achievement of learning goals are systematically monitored.	The Department has adopted a quality control system which covers not only the teaching and learning goals, but also teaching support both for teachers and students. The criteria for good teaching have been defined. The Department quality control system is linked with that of the Faculty. Feedback is effective in the Department, and new teachers are acquainted with the quality control system.
3.3. Educational planning	Neither the Department nor the teachers have a complete picture of the educational programme. Teachers do not know what their colleagues are teaching. The effectiveness of the teaching programme is not monitored.	There are individual teachers who try to ensure the compatibility of their own teaching with that of other courses, and who are aware of the demands of the strategic apparatus in teaching. No practices have been developed that would support an efficient and comprehensive planning of the teaching programme.	Both teachers and students know what the particular discipline's share of the degree programme is. Centrality and load distribution analysis and compatibility between courses are developed systematically. The Department expects teachers to continually develop the contents of their teaching, eliminate any obstacles to learning and make sure their teaching forms a sensible whole. The teaching plan takes into account the possibilities offered by the JOO-studies and the Finnish virtual university.	The Department has a clear teaching plan which is comprehensively applied. The Department also ensures that the teaching and supervision offered at the Department form a constructive element of the degree programme. The whole Department, including the students, takes part in the planning. Goals are set in accordance with international standards in the field. Levels of goal achievement are monitored through student results and progress.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
3.4. Pedagogical merit in filling teaching posts	Pedagogical merits, such as pedagogical training and the multilateral use of information technology in teaching, are not taken into account when teaching posts are filled. Such merits are viewed with suspicion or disparagement.	Teachers have academic portfolios which are used when applying for a position. It is unclear, however, how pedagogical merits are measured and what the Department's view of them is.	The Department has drawn up a consistent set of principles according to which pedagogical merits are considered and measured. The Faculty principles and practices are adopted fully when posts are filled (e.g. evaluation of teaching skills). Teachers are encouraged to compile portfolios, and the acquisition of pedagogical merit is an advantage.	Department heads and steering committees are committed to consistently promoting and underlining the value of teaching merits and high quality teaching. This is a generally accepted practice and shows continuous results. The Department and the Faculty make sure that these principles prevail when posts are filled.
3.5. Teaching development projects	There are no ongoing teaching development projects in the Department. Teaching development is not part of the work requirements for teachers.	Individual teachers are arbitrarily involved in development projects outside the Department, or have their own, private projects. Teachers are not encouraged to experiment but are nevertheless free to develop and be innovative in their own teaching.	The Department has taken part in several development programmes and makes use of their results. Teachers' initiative and ideas are taken into account in the teaching plan and the task distribution. Students participate in the experiments.	The Department is in the forefront of many innovations. Development projects are an integral part of other activities, and results are used as a basis for planning. All teachers and students may participate and get information about the experiments. The Department also follows and learns from experiments made in other departments or universities. The Department collaborates actively with the teaching development network in its field.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
3.6. Internationalism	Internationalism is not seen as a significant factor in the quality of teaching. There are few if any visiting foreign scholars/teachers or exchange students. The Department does not encourage its own students to study abroad.	Individual teachers have taken part in exchange programmes and make use of their contacts both in their teaching and to encourage student mobility between universities. Studies abroad can be partly integrated into the degree programme.	Teachers' international contacts and cooperation networks are used in teaching. Students are encouraged to study abroad. There are several foreign teachers and students at the Department.	Internationalism in teaching is purposefully promoted. Teachers are encouraged to teach internationally and they are given opportunities to do so. The Department takes an active role in international teaching networks and other cooperation. Foreign teachers and students are well integrated into the Department.
4. TEACHING				
4.1. Teaching methods	Teaching methods are not consciously evaluated. The teaching is based on traditional and 'safe' methods.	Individual teachers learn and try out new teaching methods and find out about different options.	The Department supports the development of teaching methods. The matter is discussed openly in the Department and the connection with teaching goals and teaching evaluation is understood. Teachers are encouraged to experiment and acquire pedagogical training. Teachers are allowed to choose the teaching media according to the contents and goal of their courses.	Teaching methods support the learning goals. The importance of employing a relevant pedagogical apparatus for the various teaching situations is understood, and there is a diverse methodological range of options available at the Department. The teachers are systematically encouraged, through materials and training, to get acquainted with teaching methods and their fundamental principles. The Department follows the latest pedagogical publications.

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AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
4.2. Supervision of learning and individual feedback	Students do not receive individual feedback for their learning, know how, or academic progress. There are no teacher tutors. The main bulk of the teaching is in the form of mass lectures or book exams, and it is not necessary to consult the teacher in order to receive results.	Some teachers organise their teaching in a way that allows them to give individual feedback to students. Individual teachers may act as tutors but this is not taken into account in the task division or the salary.	The Department actively develops supervision arrangements and organises a teacher tutor system. Students are offered supervision and tools for making their personal study plans, and the subsequent development of their studies is monitored. Group study is encouraged. The Department also offers Net-based supervision.	Supervision development and the teacher tutor system are part of the Department's teaching development strategy. Individual feedback is intended to support long-term learning. Students make a personal study plan according to which their study schedule is agreed upon. Teacher tutors give students guidance and support in their choices. Supervision and tutoring are seen as legitimate parts of delegating teaching tasks.
4.3. Study guidance and counselling	Study guidance is restricted to reception hours. There is no division of tasks or responsibilities.	The Department organises the division of tasks and the allocation of persons responsible. Study guidance is clearly allotted to certain people and it is followed through.	Study guidance is seen as an important task of the whole Department staff and as part of the support system for the students' academic progress. Supervision is highly valued and is counted in the working hours.	There is sufficient study guidance at every level of the syllabus. Task division between those involved in supervision is clear and teachers are well informed about each other's work. Cooperation is efficient. There is a clear study guidance strategy and it is followed through systematically and updated annually. The Department has a continually maintained high quality internet-based study guidance service.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
4.4. Use of information technology in teaching	The Department does not invest in the use of information technology, though individual teachers may do so.	Teachers are enthusiastic in applying new media and technology in developing the learning environment. The Department/ Faculty has a strategy for the use of information technology in teaching.	The Department has invested a great deal in both material and non-material resources in teaching technology. The Department/Faculty has a strategy for the use of information technology in teaching, and its execution and monitoring is well organised. The Department/ Faculty web-pages include teaching development services.	There is a clear and practical vision and strategy about the use and significance of information technology in teaching, and results are monitored. The use and development of teaching technology is seen as a significant teaching aid and is applied relevantly. Active, nationally and internationally acclaimed research is done in the field of teaching technology.
4.5. Study material	The material is often gathered hastily: handouts, transparencies, slides etc. lack cohesion and a pedagogical foundation.	Individual teachers have attempted to develop their teaching material, such as handouts, text books and web-based courses, but the Department takes no interest in their efforts.	The Department coordinates and supports the preparation, availability and distribution of diverse teaching materials. It invests in pedagogical quality and supports the use of teaching technology. Teachers are encouraged to learn new ways of producing teaching material.	The whole department, including students, is involved in the development of teaching material. The principle of cooperation is a fruitful one in the planning of teaching material. All the material is public and available to all teachers.
4.6. Contacts with the job market	Work experience cannot be integrated into the study programme. The teachers' and researchers' contacts are not made use of in planning the contents or methodology of teaching.	Students can gain work experience but in the degree structure it is often categorized as part of extra studies. The student is responsible for finding work. Teachers may provide some contacts with the job market.	Work experience is part of the degree and the Department arranges the work opportunities. In most cases, the trainee is paid a salary, but not always. Through work experience the students get an idea of the skills needed in working life. The Department also offers information on the skills/ abilities required.	Work experience is an essential part of studies and the degree. The Department is up to date with regard to the demands of working life. Work experience is integrated into the study programme so as to enhance the swift employment of graduates. The experience and skills acquired during work experience is followed up by means of student reports and contacts with employers.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
5. LEARNING RESULTS				
5.1. Core syllabus	It is not clear whether students attain a command of the essential elements demanded of an expert in the field.	Individual teachers follow student results and attempt to chart their command of the core syllabus.	The department has made a core syllabus analysis, and student results will be monitored in the future.	Both teachers and students know what is part of the core syllabus and they take part in evaluating the students' command of it. Achievement of learning goals is followed systematically.
5.2. Acquiring good learning strategies	Acquiring good learning strategies is not seen as part of the teaching and is not viewed as being part of the Department's domain.	Individual teachers are acquainted with different learning and studying techniques. On their own courses, they try to support different types of learners e.g. by offering a variety of ways of completing the course.	The Department has invested in developing studying skills. Students with learning difficulties or who find it hard to complete their studies can also be directed to support services offered by the Faculty or the University.	The Department takes into account the aspect of acquiring good learning strategies. It is seen as a significant skill for graduates in their working life. The principle of lifelong learning is introduced to students as an integral part of the work of the expert in the field.
5.3. The exam system and learning evaluation	Examination takes place in a traditional manner. Evaluation is seen mainly as a form of control.	Individual teachers experiment with examinations and are interested in exam feedback so as to develop the system to better correspond with the students' wishes.	The Department has a diverse and flexible exam system. Exams are developed from a pedagogical starting point at department level. It is understood that the learning evaluation methods are a powerful influence on students' learning.	The Department has a diverse and pedagogically well founded learning evaluation system. Teachers are trained to plan and carry out evaluation. Evaluation of their learning and the corresponding feedback help the students to deepen their understanding of the learning process. The evaluation methods support the learning goals and the teaching methods used.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
5.4. Grading criteria	There are no statistics about course or paper grades. Teachers are not familiar with each other's grading policies, and the students are not familiar with grading criteria.	Teachers compare their grading policies with each other, and some have made their criteria available to the students. The students have arbitrary information about the policies. The grading scale for papers and masters' theses is arbitrary and inconsistent.	There is systematic information on grades and grading systems, and teachers have instructions on these. In addition, students receive information on them. Teachers are instructed to use the grading scale fully and consistently.	The grading criteria have been decided upon together and their application is monitored. The department has information on the international learning goals of the field. Students get clear, reliable and well founded information on what is expected of them at each phase of their studies. Feedback is used to enhance the students' depth of learning.
6. RESOURCES				
6.1. Human resources	There is not enough teaching staff and the Department has not really succeeded in guaranteeing scholarly competence or other necessary know-how. The teachers are overburdened and they have no clear idea of the Department's financial situation.	The lack of teaching resources is known in the Department. Some individual solutions may have been made to help the situation in some subject or field. No permanent solutions have been found.	To ensure a good level of scholarly competence and know-how among the teaching staff the Department has a personnel plan. Many researchers teach and supervise students, and long-term investment is made in web-based teaching. Students participate in the future planning of teaching.	Personnel policies are carried out systematically. The whole staff, including researchers and students, are involved in planning and carrying out the teaching programme. New solutions have been found for the shortage of resources, and plans for the future are more long term.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
6.2. Pedagogical skills of teachers	Teachers have no pedagogical training, and pedagogical skills are not taken into account in any way in the Department. The Head of Department is not informed of the teachers' qualifications. There are no staff meetings dedicated to development in this area.	Some teachers have taken the initiative to acquire pedagogical training or training in the use of information technology in teaching, even though this is not encouraged at the Department. Development meetings are familiar as a concept but they have not yet been employed.	Most of the teachers have acquired pedagogical and IT-training and the Department encourages them to develop their skills. Student feedback shows appreciation of high-level teaching. The Head has development meetings with the teachers, the information flow has improved and the meetings help in e.g. planning the teaching.	The consistent goal is that all teachers, including non-permanent staff, receive pedagogical training and training in the use of information technology in teaching. A variety of pedagogical know how is taken into account in many ways in departmental planning or organisation. New teachers are made familiar with the teaching task in accordance with the Department's philosophy. Pedagogical know how, career development, and future work are discussed in the development meetings between the Head of Department and teachers. Teachers are more motivated in their work than earlier.
6.3. Premises and equipment	The Department premises are insufficient in size, equipment and versatility. Teaching, research and studying takes place in several different locations. The students have no room of their own, nor do they have computers at their disposal at the Department.	Problems concerning the premises have been noticed and there are plans to resolve them. However, the Department will have to settle for temporary premises for still some time, and there are not enough resources for temporary renovations. Students tend to use the services of the Faculty library or other learning centres and they are not much seen at the Department.	The Department premises are well established and equipped, also from the point of view of IT. Teachers, researchers and students are satisfied with the premises. The students have their own room at the Department, which has improved cooperation and interaction between teachers and students.	The Department premises are adequately equipped, versatile, and well suited for the use of information technology in teaching. Teachers, researchers, and students can work in the Department premises and engage in fruitful interaction. Neighbouring departments and faculties have joined forces and found satisfactory solutions to particular mutual needs. There is access to the web in every room.

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AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
6.4. Student recruitment	Student intake follows traditional means. It is not seen to be necessary to invest resources in reforming it.	Reforming the intake process of new students is seen as important, but finding new methods is seen as a difficult challenge. Individual changes have been made, but there is uncertainty about their real effects.	By reforming the intake process the Department wishes to increase the motivation and skills of new students. Consistent development work has been done and the results are systematically monitored. There are different channels for different applicant groups. The Department has also invested in marketing.	Student recruitment is part of the Faculty teaching strategy. The selection process is made as efficient and expedient as possible. Achievement of goals and the student quota of different fields is monitored. Marketing and communication is arranged adequately.
7. FEEDBACK AND FOLLOW-UP				
7.1. Student feedback	There is no comprehensive feedback mechanism in the Department. Individual teachers may ask for feedback for their own purposes. The students have no established feedback channels at their disposal. The Department does not make use of information technology to collect and analyse feedback.	The Department tries to maintain a student feedback system. Continuity is uncertain, however, because students are passive and teachers are unwilling or unable to make use of feedback in their teaching. Collecting feedback is seen as important, but also difficult, troublesome, and even daunting.	The Department tries to make sure that the feedback mechanism works in spite of the difficulties. The system is continually developed and students are involved in this development. Feedback is appreciated and it is taken into account. This is regularly reported back to the students. Information technology is made use of in collecting and analysing feedback.	Department heads and steering committees are unambiguously committed to the efficiency of the feedback process. Feedback must be obtained and it must show at the practical level. There is a safe and trusting atmosphere between teachers and students. Criticism can be severe but it is always taken constructively. There is feedback both for learning and teaching.

AREA OF QUALITY OR RESULTS	*Only satisfactory quality and results*	*Quality and results need developing*	*Good quality and results*	*Excellent quality and outstanding results*
7.2. Feedback from working life	No feedback is collected from working life. There is no precise knowledge about where graduates go after their studies.	Individual surveys have been made among graduates regarding satisfaction with their education.	Some information has from time to time been gathered on employer satisfaction and that of employees who are Department graduates. The Faculty or the Department has an advisory committee which communicates with interest groups in the field.	Feedback from working life is gathered systematically using various channels. Contacts between the Faculty or Department and the interest groups and alumni are solid. The information gathered is used in planning the training programme.
7.3. Employment	There is no precise information about the employment situation of Department graduates.	Organisations in the field produce information about the employment situation of graduates. The Department is following the situation.	The Department gathers information about the employment situation of graduates. They are also informed about the future labour market needs for graduates in the field.	The Department is well informed about the educational needs of the field and the employment situation of graduates. This information is used in the planning of the operations of the Department. Students receive information about employment prospects in the field already at an early stage in their studies.
8. POST-GRADUATE STUDIES				
8.1. Recruitment and position of postgraduate students	The basis for admission in the postgraduate programme is unclear and there is no cohesion between the different departments. It is difficult for students to find information on the curriculum and funding. There is no up to date information on the number of postgraduate students or the stage of their studies.	There is information available on how to apply for the postgraduate programme, but it is still arbitrary and there are inconsistencies between different disciplines. Registration is arbitrary and it is difficult to obtain up-to-date information on the progress of postgraduate studies.	The Faculty and the departments have consistent rules on postgraduate studies and application. All postgraduate students have been registered and their studies are registered in Oodi. Funding advice is available.	The Department actively recruits postgraduate students and makes sure they begin their studies successfully. Their progress is followed up by means of an up-to-date register.

AREA OF QUALITY OR RESULTS	Only satisfactory quality and results	Quality and results need developing	Good quality and results	Excellent quality and outstanding results
8.2. Supervision and teaching	A postgraduate student is appointed a formal supervisor. There is little teaching specifically intended for postgraduates. The Department has not coordinated teaching and supervision.	There are individual teachers at the Department who invest particularly in postgraduate supervision. Research groups are separate from the department. Postgraduates who are involved in research groups are likely to get better supervision than those who are not.	The Department has invested in the equal treatment of all postgraduate students. The organisation of teaching is coordinated. A student interested in postgraduate studies can choose a research-oriented line already at undergraduate level. International exchange programmes are a natural part of postgraduate studies.	Each postgraduate student has a personal study and supervision programme which is checked from time to time. Supervisors take an active interest in the progress of their students. Teaching is multifaceted and is carried out using all the potential of cooperation. Teaching also takes into acount the demands of the job market.
8.3. Schools for Advanced Studies and postgraduate cooperation	There are no schools or cooperation in advanced studies in the field, and there is no interest in these at the Department.	Postgraduates in the field have taken part in some curricular activities in some schools for advanced studies. There is no exact information available.	There is/are school(s) for advanced studies in the field and researchers' posts are popular. There has been investement in the funding and organisation of postgraduate studies.	The schools for advanced studies in the field are well established and their results are internationally acclaimed. Quality and results are monitored and evaluated.
8.4. Specialisation	There is no possibility of specialisation in the field.	Specialisation is arbitrarily possible, and it is funded sporadically. The level of need for specialisation is unclear, even though there seems to be a market for it.	There are adequate and organised opportunities for specialisation. It is possible to do a Licenciate degree with a vocational or specialized (ammatillinen) emphasis.	Specialisation in the field is established. Quality of training is ensured in cooperation with the job market, teachers and students, making use of different feedback mechanisms.

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Teaching evaluation matrix / APPENDIX 1: SELF-ASSESSMENT FORM

AREA OF QUALITY OR RESULTS	Only satisfactory	Under developed	Good	Excellent
1. TEACHING AND RESEARCH				
1.1. Teaching, studies and research				
1.2. Pedagogical research as a support for teaching				
2. TEACHING GOALS				
2.1. Teaching goals and core elements				
2.2. Student-centred teaching				
3. LEADERSHIP OF TEACHING				
3.1. Teaching Strategy				
3.2. Quality control in teaching				
3.3. Educational planning				
3.4. Pedagogical merit in filling teaching posts				
3.5. Teaching development projects				
3.6. Internationalism				
4. TEACHING				
4.1. Teaching methods				
4.2. Supervision of learning and individual feedback				
4.3. Study guidance and counselling				
4.4. Use of information technology in teaching				
4.5. Study material				
4.6. Contacts with the job market				
5. LEARNING RESULTS				
5.1. Core syllabus				
5.2. Acquiring good learning strategies				
5.3. The exam system and learning evaluation				
5.4. Grading criteria				
6. RESOURCES				
6.1. Human resources				
6.2. Pedagogical skills of teachers				
6.3. Premises and equipment				
6.4. Student recruitment				
7. FEEDBACK AND FOLLOW				
7.1. Student feedback				
7.2. Feedback from working life				
7.3. Employment				
8. POSTGRADUATE STUDIES				
8.1. Recruitment and position of postgraduate students				
8.2. Supervision and teaching				
8.3. Schools for Advanced Studies and postgraduate cooperation				
8.4. Specialisation				

Teaching evaluation matrix / APPENDIX 2: STATISTICS

	1999	2000	2001	2002	2003
New students/year					
Number of active students					
—undergraduates					
—postgraduates					
—minor subject students					
Graduates/year (BA, MA, PhD)					
Total time of study					
—MA					
—PhD					
Drop outs					

Employment					
Undergraduates/teachers					
Postgraduates/professors or senior researchers					
Study weeks/ teacher					

Foreign exchange students					
Foreign degree students					
Teacher exchange					
Studying abroad					

Equipment (computers) / student/teacher					
Number of courses with IT-based teaching					

University pedagogical training for personnel (5 study weeks)					

5. **University of Deusto**

The University of Deusto* has developed a systematic approach to evaluate competences which is presented here on the basis of one example: the generic competence *teamwork*. For all other Tuning generic competences a comparable matrix have also been designed.

COMPETENCE: TEAMWORK

Definition: it is the ability to integrate oneself, and actively collaborate with other people, in different areas and organisations in the achievement of common goals.

The achievement of this competence is closely related to: Good social skills, and high levels of interest in interpersonal relationships. Well-defined social values that lead to a belief in the integrity, honesty, and ability of others. Competence in interpersonal communication. Sufficient capacity to be able to deal with different opinions. Belief in the efficiency of shared work. Willingness and interest for the free exchange of ideas and information. Appreciation of the values of collaboration and support.

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* Responsible for the development of this methodology was a team of experts consisting of Manuel Poblete (Coord.), María García Feijoó, Ana García Olalla, Gonzalo Malla, José Antonio Marín, Josu Solabarrieta and Aurelio Villa.

LEVELS OF ACHIEVEMENT	INDICATORS	DESCRIPTIONS				
		1	2	3	4	5
FIRST LEVEL OF ACHIEVEMENT: Actively participates and collaborates in team tasks, and encourages trust, friendliness, and focus on the common goal through the attitudes they convey.	Completes group tasks that have been assigned to them within the required time frame.	Does not complete assigned tasks.	Partly completes tasks, or does so but with delay.	Completes the required tasks on deadline.	The quality of the task completed makes it significantly useful to the team.	As well as completing the required task, the work done guides and facilitates the work of the rest of the group.
	Actively participates in team meetings, sharing information, knowledge, and experience.	Is frequently absent from group sessions and, when present, their presence is irrelevant.	Participates little, and then only at the suggestions of others.	Generally active in participation at group sessions	Their intervention encourages participation and improves the quality of the team's work as a whole	The contributions are fundamental both to group dynamics and to achieving a quality result.
	Cooperates in the definition, organisation, and distribution of group tasks.	Resists the organisation of teamwork.	Involvement limited to accepting the organisational plans offered by other team members.	Participates in planning, organisation, and distribution of group work.	Is organised and efficiently distributes tasks.	Encourages organised working, making the most of the resources of every team member.
	Aims at achieving agreements and common objectives, and is committed to them.	Achieves their own personal objectives.	Has difficulty integrating personal objectives with those of the group.	Takes on group objectives as their own.	Promotes the clear definition of objectives, and group integration in relation to achieving them.	Mobilises and encourages the group to be cohesive when dealing with demanding objectives. Groups in which they participate are outstanding in their performance and quality.
	Takes into account the points of view of others and gives constructive feedback.	Does not listen to the suggestions of the colleagues, and systematically dismisses them. Wants to impose their own opinions.	Listens little, does not ask questions, does not care about the opinions of others. Their intervention is redundant and of very little use.	Accepts the views of others and knows how to put across their own in a constructive manner.	Brings about constructive dialogue and encourages other groups members to make high quality contributions.	Assimilates the opinions of others and integrates them so as to make a stronger whole, while maintaining an attitude of cooperation and support.

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LEVELS OF ACHIEVEMENT	INDICATORS	DESCRIPTIONS				
		1	**2**	**3**	**4**	**5**
FIRST LEVEL OF ACHIEVEMENT: Actively participates and collaborates in team tasks, and encourages trust, friendliness, and focus on the common goal through the attitudes they convey.	Accepts and follows group guidelines.	Does not accept or follow group guidelines.	Questions group guidelines, and tries to adapt them so as to suit personal interests.	Accepts and follows group guidelines.	Takes part in decisions concerning the establishment of group guidelines.	Proposes guidelines for the improvement of group management and dynamics. Supervises the following of these guidelines.
	Contributes to the establishment and application of teamwork processes.	Is unaware of, or does not pay attention to, methods and procedures agreed upon by the team.	Has problems understanding and applying established work patterns.	Follows methods and procedures adequately for the efficient carrying out of team work.	Plays an active role in the design of teamwork procedures.	Brings about change in teamwork procedures, so as to improve their quality.
	Acts constructively when faces with conflict within the group.	Provokes group conflict without suggesting solutions.	Avoids involvement in conflicts.	Acts for the positive resolution of any conflicts that arise within the team.	Notices the first signs of conflict and acts quickly so as to avoid it.	Acts so as to bring a bout constructive solutions to problems, avoiding their prolongation or extension.
	Contributes to the cohesion of the group through their manner of communicating and relating to people.	Acts aggressively, criticising or questioning the ability of the group to reach agreements.	Is passive, and communicates little with other group members.	Communicates their ideas and opinions to the rest of the group clearly and directly.	Has a positive relationship with all group members, supporting and encouraging them.	Suggests meetings further to the formal ones, so as to improve group cohesion.
	Shows interest in the importance to society of the work being undertaken by the group.	Denies or questions the usefulness or importance of teamwork.	Shows an interest in encouraging others to participate in common activities.	Supports and defends the usefulness and importance of teamwork. Provides positive evaluations.	Has a firm belief that the work of the individual is vital for the successful achievement of group goals.	Encourages others to see that what they are doing has wider repercussions for other groups and bodies.

LEVELS OF ACHIEVEMENT	INDICATORS	DESCRIPTIONS				
		1	2	3	4	5
THIRD LEVEL OF ACHIEVEMENT: Is capable of running work groups, guaranteeing the integration of all group members, and their focus on an excellent level of work achieved.	Actively cooperates in the planning of group work, the distribution of tasks, and deadlines.	Does things without any prior planning	Makes last minute plans, and leaves loose ends. Unrealistic deadlines.	Makes concrete suggestions for the distribution of tasks, and sets reasonable deadlines.	Stimulates the participation of other group members, coordinating their contributions.	Distributes feasible tasks to members, along with clear aims, in timepressured situations when there are many elements to be dealt with.
	Efficiently manages meetings.	Is not capable of coordinating a meeting for which they are responsible.	Attempts to manage the meeting but is not in control of the timetable, commitments made,	Efficiently manages meetings, and achieves their objectives.	Efficiently manages meetings, achieving balanced participation from all those present.	Achieves balanced participation and commitment from all team members.
	Suggests ambitious and welldefined goals for the group.	Is incapable of forming clear objectives for the group.	Suggests ‘fuzzy’ goals that confuse the group	Suggests attractive goals for the group, and defines them clearly.	Encourages the team, defining achievable goals and a clear vision for the future.	Energises the team so that they take on group objectives as their own.
	Facilitates the positive management of differences, disagreements, and conflicts that arise within the team.	Encourages conflicts by exaggerating differences.	Gets lost and does not know how to reconcile differences expressed by others without completely removing themselves from the situation.	Faces up to conflicts, dealing with all contributions and differences that there are in the team.	Faces up to conflicts, balancing contributions, and coming out successfully.	Makes others see differences as enriching, and enabling the achievement of agreements pleasing to everybody.
	Encourages all team members to commit themselves to the management and running of the group.	Does not make a personal commitment, damaging group dynamics	Finds it difficult to achieve a basic commitment from members for the functioning of the group.	Gets the commitment of every participant, meaning that the team works as such.	Gets a personal and collective commitment from the team with regards all key aspects of the project.	Achieves a state in which team members show commitment and accept the suggestions of others as their own.

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PART TWO

5

Subject Specific Competences

5.1. BUSINESS ADMINISTRATION

Background

As there is a great diversity in the ways in which business programmes can and have been designed, it is difficult to come up with a single standard for the aims, contents and subject specific competences that are to be achieved at first and second cycle business programmes around Europe. However, across institutions there do exists a number of similarities in aims, contents and views on subject specific competences in first cycle programmes, whereas opinions differ more at second cycle programmes. In Tuning 1 the business group succeeded in developing a framework for describing business programme contents, which has been a main contribution to describing in more details subject specific competences to be achieved in relation to the field of business. This paper takes a very general view on the tasks of a business organisation and the tasks business graduates are expected to be able to perform. These views led to an academic description of the more business-generic tasks graduates are expected to be able fulfil, resulting in level descriptor at first and second cycle based on the framework developed during Tuning 1.

Characteristics of a business organisation and the tasks of business graduates

In general, the characteristics of the work and the aims of a business organisation can be described from many different perspectives. One of the most frequently used is the view that the basic function of a business organisation can be identified using a value chain perspective, which then leads to the following primary functions of a business organisation:

—Procurement.
—Manufacturing product and/or services.
—Selling.
—Service before, during and after sale.

And in addition a number of supportive functions such as design, development and maintenance of:

—company infrastructure,
—company structure and systems,
—information systems.

Assuming that business graduates will mainly be involved in the economic, planning and human resource management aspects of a business organisation, HE institutions should develop subject specific skills and competences in relation to these functions and tasks. From a general theoretical point of view this leads to a focus on the following generic abilities required in different types of organisations and within different subject areas to prepare graduates for an ever changing business environment:

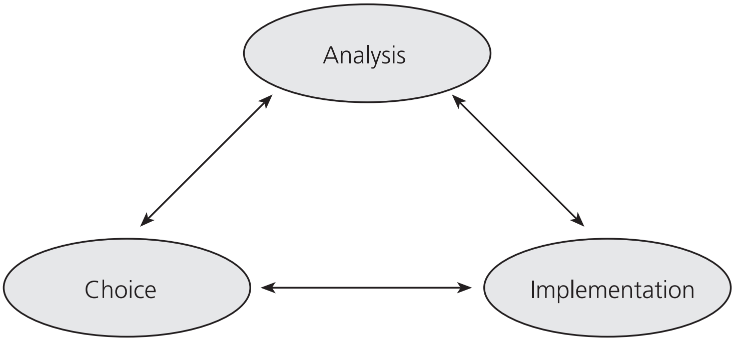

Figure 1

Generic abilities

Analysis implies abilities in identifying:

- —The environment in which problem solving takes place.
- —Assumptions and objectives for solution of problems.
- —The resources and competences required to solve the problem.

Choice means for instance:

- —Being able to make decisions.
- —Being aware of the uncertainties and risks associated with making choices.
- —Stating the implications and consequences of the choice made.
- —Being able to argue and defend a choice.

Implementation requires abilities in:

- —Planning and organising.
- —Creating the right setting.
- —Managing change.
- —Argumentation and follow-up.

Towards level descriptors

In the Final Report from Tuning 1[32], the business group developed a taxonomy which, from a theoretical point of view, could be useful when characterising business courses, dividing business courses into 3 main categories:

1. Core-Knowledge courses.
2. Knowledge-deepening courses, with the possible orientations:
   - —Vertical.
   - —Horizontal.
   - —Diverse.
3. Generic-skills courses (subject independent), divided into:
   - —Instrumental competences (personal).
   - —Interpersonal competences (organisational and communications skills).
   - —System competences (transferable skills).

Core knowledge means the insight into basic theories on functions necessary to be able to work as a business graduate in an organisation.

[32] P. 101-110.

Knowledge deepening means widening or/and deepening the insight into theories on functions, and *system competences* relates to skills enabling the graduate to do the job and to relate and/or see the consequences of a function in relation to the entire organisation and its environment.

During the work of the business group, it has become evident that categorising courses and programmes by means of this taxonomy is useful, and in particular useful to describe expected contents of first cycle degrees. Although some diversity exist among HE institution in business around Europe, it proved possible to identify a number of core-knowledge and generic-skills courses recognized by the business group as prerequisite courses either for second cycle programs or in order to perform business functions in a company. As for second cycle programs, most institutions focus on knowledge-deepening elements and generic-skills building However, due to major differences in orientation (vertical, horizontal or diverse), the business group did not find sufficient common course elements at second cycle programmes in the institutions to establish a catalogue of common course elements at second cycle business programmes. The group, however, was able to list a general set of level descriptions.

Course elements recommended to be included at a first cycle business programs in Europe

Based on the analysis made by the business using the value-chain perspective of a business, business programmes at first cycles are expected to include the following courses, based on the taxonomy:

1. **Core Knowledge (and to some extent 2. Deepening)**

—Operations management/logistics.
—Sales and Marketing.
—Supportive functions represented by courses such as:

- Organisation.
- Human Resource Management.
- Finance and Accounting.
- General Management.

3.a. **Instrumental skills**

—Economics (micro and macro).
—Quantitative methods (mathematics, statistics, market research).

—Law (national and/or international).
—IT (separate or integrated into other courses).

3.b. **Competences in personal organisation and communication skills**

—Language (separate or integrated into other courses).
—Presentation/communication/teamwork (separate or integrated into other courses).

3.c. **Systemic skill (transferable)**

—Either a Bachelor thesis, internship, or activities documenting ability to solve problems across different business subject areas.

As for the scope and extent of core knowledge (1. above), the business group recommends that at least 50 percent of the credits of a first cycle program are allocated to the subjects of core knowledge, and as for instrumental skills, economics should account for at least 10 percents of credits, while the quantitative methods, law and IT each should have at least 5 percent each of the credits in a program.

Second cycle

Due to the diversity of second cycle business programmes at universities and business schools in Europe, the group found it impossible to make general descriptions and classifications of the wide range of courses at second cycles. Seen in the light of internalisation and exchange programmes, the variety in second cycle programmes represents a necessary and welcome specialisation to the benefit of students, academics and business, and as a means to develop comparative advantages, which is totally in line with the ideas behind the Bologna Declaration. Therefore the group will not put forward specific guidelines on the subjects to be covered at second cycle programmes, but only list general level descriptors of courses typically found at second cycle.

Teaching and assessment constitute the basis for level descriptors

The previous paragraphs have mainly dealt with the subject specific course contents, and as already mentioned a number of common basic knowledge and instrumental skills courses can be identified at first cycle.

However, it should be emphasised that course contents should be seen in conjunction with the assessment of courses in order to evaluate the level of development of communication, organisation and system skills.

Each individual course in a curriculum should set up expected learning objectives, and any assessment of whether the outcomes have be achieved should be judged by including both the teaching methodology and the evaluation form. For example, a course taught in lectures to a large group of students, which means that mostly knowledge and understanding are achieved; however, if the course claims to achieve eg. abilities in communication and decision making, then the type of evaluation should reflect that; otherwise the expected learning objectives should be revised. The same argumentation goes for entire programmes, where a variety of different teaching and evaluations forms aims to build up a variety of skills and competences. Programmes entirely based on lectures and written exams cannot be expected to build up a variety of competences, such as communication skills, ability to organise etc.

Level descriptors

For students to be able to achieve the abilities necessary to analyse, make choices and implement in a business organisation or other environment, the following level descriptors for first and second cycle skills and competences should be included.

The level descriptors reflect the great variety of tasks a business graduate should be expected be able to perform in relation to the many and diverse business functions. The descriptors should apply for both first and second cycles, and at the same time have a natural progression and be linked.

The business group finds that high ethical standards always should be a foundation of teaching and learning and always be a main objective for students and graduates in their approaches to the *analyses, choices* and *implementation efforts.*

First cycle level descriptors

Students should be able to:

a) Use and evaluate tools for analysing a company in its environment.
b) Work in a subject specific field of a company, and be a specialist to some extent

c) Interface with other functions.
d) Have self-awareness.
e) Be able to argue for the principles to be used in finding a solution to a problem mainly at an operational or tactical level.
f) Defend the proposed solution.
g) Prepare for decision making at mainly operational and tactical levels.

As already mentioned, there is a great diversity in the length and contents of first cycle business programmes around Europe, which in turn influences the length, contents and objectives of second cycle programmes, and makes it difficult to set up firm levels descriptors for second cycle programmes. However, the business group suggests the following intentional level descriptors for second cycle.

Second cycle level descriptors

Students should have:

a) Skills enabling them to participate in strategic decision making.
b) Ability to do guided research.
c) Ability to work independently.
d) Skills to perform holistic judgement and abilities to make critical assessments on strategic solutions.
e) Skills to manage change.
f) International mobility and cultural understanding.

In order to establish whether an entire programme content is in accordance with the level descriptors, the expectations built up among stakeholders in terms of learning outcomes should be considered. It is recommended that HE view the abilities reached after completing a programme by including in their reflection whether the students have acquired in their learning process the abilities to formulate:

1. Background.
2. Research question.
3. Methodology.
4. Analyses.
5. Conclusion.
6. Recommendations.
7. Literature.
7. Presentation/language/communication.

when faced with a problem originating within a business context. These assessment criteria are the criteria often used by academics in the assessment of seminars, projects, thesis scientific papers etc.

Conclusion

This paper focuses on the general tasks of business organisations and the roles and tasks business graduates are supposed to perform in business organisations. Based on this, a taxonomy for business programme contents is established, leading to recommended course elements at first cycle programmes. These common guidelines can be used not just for developing future first cycle programmes, but also allow HE in business to develop and specialise their second cycle programmes, which may eventually increase not just student, but also academic mobility in Europe, leading to an increase in the exchange of academic and cultural values and traditions across European institutions.

The fact that it has not been possible for the group to describe common course elements at second cycle should not be seen as an obstacle,; on the contrary, it reflects the diversity due to cultural differences across Europe, allowing specialisation, which according to conventional economic wisdom creates comparative advantages, leading to increased need and willingness to exchange goods and services, including teaching and research. Some similarity in the contents and evaluation of first cycle courses and programmes is, however, a prerequisite for fostering this development.

A cornerstone in this development is the level descriptors recommended, which in fact are the assessment criteria not just for courses or entire programmes, but quality descriptors ensuring more transparency among HE in business, and common quality standards. It is very important to emphasise that the level descriptors are holistic in the sense that they should not just be used to evaluate course contents or evaluation forms, but seen as descriptors ensuring that promised learning outcomes from courses and programmes at different levels have indeed been achieved. The level descriptors also support the most important and needed generic skills found in the surveys made in the Tuning Project 1.

Prepared by Volker Gehmlich and Peder Ostergaard

5.2. EUROPEAN STUDIES

Introduction

For mapping the area of European Studies it should be stressed at the very beginning, that this area is both multi-disciplinary and inter-disciplinary, as explained below. European studies programmes are provided by different faculties and departments and their primary disciplinary orientation has a decisive effect on the character of the European studies programme within the Institution. Moreover the relationships between the structure, content and approach to teaching also differ considerably in the various European countries. Nevertheless, there are also similarities that provide an identity to European Studies as a distinct subject area. The purpose of this paper is not to consider the time allocations for the different components, which vary from programme to programme, but to deal with the overall structural issues in the subject area.

Structure of University Programmes

There is a great deal of variation between the individual study programmes of the universities participating in the project. In particular:

a) Programmes exist in such faculties/department as law, arts, economics, history, business administration, politics and sociology and the character of the programme is influenced by the nature of its home faculty/department. Because European studies is a relatively young subject area, most of the programmes are based in a distinct faculty/department. Nevertheless, there are some faculties/departments that concentrate exclusively on the subject area of European studies.
b) There is also a difference in the perspective of individual universities on the content of European studies as a subject area, with two main tendencies identified. The first is mainly represented by universities from countries that have been members of the EU for some time, while the second one is more typical for universities from «new» EU countries. European Studies at the first group of universities is mostly viewed as studies of various subject areas within a European context, eg. sociology, policy, history, culture etc. However the approach of the other group is a little different, for the programmes at these

universities are especially aimed at educating experts for EU administrative structures.

Nevertheless, the European studies group was able to identify the following subject specific competences at its first meeting in Brussels in May 2003:

1. Ability to comment on or annotate documents appropriately in relation to critical issues in European Studies.
2. Ability to communicate orally in foreign languages using the appropriate terminology in this subject area.
3. Ability to communicate orally in one's own language using the appropriate terminology.
4. Ability to define suitable research topics contributing to debates on European integration.
5. Ability to identify and utilise appropriately sources of information (bibliography, documents, websites, etc) in all relevant areas.
6. Ability to organise complex research results in a coherent form.
7. Ability to work in a multicultural team.
8. Ability to work on an interdisciplinary area.
9. Ability to undertake field investigations and surveys using appropriately sensitive methodologies.
10. Ability to reflect on one's own values and to question concepts, ideas and theories.
11. Ability to interpret European events, developments and policies in national, regional and local frameworks.
12. Awareness of the complexity of the EU enlargement and integration processes.
13. Awareness of the complexity of the process of wider European Co-operation.
14. Awareness of and ability to use different disciplinary methodologies in an integrated way.
15. Awareness of and respect for points of view deriving from different European national and cultural backgrounds.
16. Awareness of and respect for points of view deriving from non-European national and cultural backgrounds.
17. Awareness of the relevance of European Studies in the contemporary development of Europe.
18. Awareness of the social chapter (welfare state, employability, higher education, etc.) in the framework of the EU integration process.

19. Awareness of the debates about European citizenship and European identity.
20. Knowledge of:

    - Business Studies.
    - Economics.
    - European Cultures.
    - Geography.
    - History.
    - International Relations.
    - Law.
    - Philosophy.
    - Politics.
    - Sociology and Demography.

21. Knowledge of and ability to use information retrieval tools.
22. Knowledge of modern European history in a comparative perspective.
23. Knowledge of integration theories.
24. Knowledge of the history of European integration.
25. Knowledge of ideas of Europe.
26. Knowledge of European Union institutions and decision-making processes.
27. Knowledge of European Union policies.
28. Knowledge of the national, regional and local impact of the integration process in Europe.

One of the striking aspects of the discussions, confirmed by the response to the questionnaire of academics in most European countries, was the great similarity of the subject specific competences for the first and second cycle, although the second cycle would lead to learning outcomes at a higher level. Following discussion at Athens in November 2003 and at Brussels in 2004, the core content for the subject area at first and second cycle were agreed as follows:

—**Core of European studies for first cycle:**

- Knowledge of ideas/concepts of Europe.
- Knowledge of European integration.
- Knowledge of European institutions and decision making policies.
- Knowledge of EU policies.
- Europe in the world.
- Ability to work on an interdisciplinary area.

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- Ability to communicate in own and an international language using the appropriate terminology.

—**Core of European studies for second cycle:**

- Knowledge of ideas/concepts of Europe.
- Knowledge of European integration.
- Knowledge of European institutions and decision making policies.
- Knowledge of EU policies.
- Europe in the world.
- Ability to use different disciplinary methodologies in an integrated way.
- Ability to interpret European events, developments and policies in national, regional and local frameworks.
- Ability to communicate in own and an international language using the appropriate terminology.

The reasons for the similarity of the competences at the two levels stimulated much discussion at both the Athens meeting and the meeting in Brussels in May 2004. One obvious factor was that students who take European Studies at Masters level have often taken a different subject at Bachelors level. They may, for example, take a subject, such as Economics, History, or Politics in their first cycle and then choose to take European Studies at second cycle level. This means that the Masters degree cannot assume familiarity with the subject area (for example, of the European Union) in the same way as in single disciplines. A further factor is that many universities tend to provide *either* a Bachelors *or* a Masters degree in European Studies and therefore the definition of the necessary components of the degrees is similar. However, in the Athens discussions the Tuning group recognised that the difference in level at first and second cycles was reflected partly in a greater emphasis on *abilities* rather than *knowledge*, and also in relation to the development of inter-disciplinarity. The latter issue was discussed in much greater depth at the meeting in Brussels in May 2004.

Multi- and Inter-disciplinarity

It was agreed that European Studies was both a multi-disciplinary and an inter-disciplinary subject area. The difference was agreed to be as follows: «*multi-disciplinary*» designates a course in which a number of disciplines relevant to, or constitutive of, European Studies are studied in parallel; «*inter-disciplinary*» indicates a course in which some or all of these disciplines are brought into sufficiently close contact for a synthesis to take place.

This distinction naturally also raises several problems of both a practical and theoretical nature. For example, in some countries there may be national jurisdictions that make the recognition of «joint» degrees rather difficult. However, the group was more concerned with some of the theoretical issues and their relationship with learning and teaching. In particular, the following questions were discussed:

- How can multi-disciplinary input yield inter-disciplinary output?
- Does an inter-disciplinary course imply multiple staffing?
- In an inter-disciplinary course, who is responsible for the integration —the student, the teachers, or all parties concerned?
- If multi- and inter-disciplinary studies coexist within a particular degree, in what sequence are they introduced?
- If there is a transition from multi- to inter-disciplinarity, at what point does it take place and what are the pedagogic implications?

These discussions led to a refinement of the distinction between first and second cycles.

- The first cycle model proceeds from a first part in which relevant component disciplines are normally studied in parallel (although some thematic elements of modules may be introduced at an early stage). After adequate induction, perhaps of one or two full-time years, the course ends with a moment of integration or synthesis, in which the different disciplines inform each other in an appropriate pedagogic and methodological environment.
- If the second cycle recruits students who have successfully completed a first cycle course of the type above, it can be wholly inter-disciplinary.
- If, however, it caters for students who have graduated via single-subject routes, it will proceed from multi- to inter-disciplinary studies, by analogy with the first cycle programme, though at a higher level.

These decisions also led to some amendment of the first and second cycle level descriptors, as shown in the next section.

European Studies level descriptors

The level descriptors for European Studies reflect the multidisciplinary character of the subject, with individual disciplines presented at first cycle at introductory level, while at second cycle they are deepened with further specialisation. The focus on inter-disciplinary studies is normally introduced towards the end of cycle 1 and reinforced in cycle 2.

First Cycle Level Descriptors

After completion of the first cycle, students in the area of European studies should be able to:

a) Work on an interdisciplinary subject area.
b) Communicate in own and an international language using the appropriate terminology.
c) Show an understanding of the multi-disciplinarity of the area and the connections between its disciplines.
d) Prove familiarity with ideas and concepts of Europe and European integration.
e) Prove familiarity with European institutions and decision making policies.

A considerable variety of first cycle European Studies programmes exists in Europe. Specification of second cycle level descriptors is accordingly difficult, since Masters degrees are tailored to the type of Bachelors courses from which their students typically come. Some second cycle programmes will move from multi-disciplinary to inter-disciplinary studies, others will be wholly inter-disciplinary. Some will retain many disciplines throughout, other still give priority to one in particular. The list below thus contains both general and specific descriptors.

Second Cycle Level Descriptors

After the completion of the second cycle, students in the area of European studies should:

a) Have an ability to interpret European events, developments and policies in national, regional and local frameworks.
b) Have an ability to use different disciplinary methodologies in an integrated way.
c) Have sufficient competences to do guided research.
d) Have an ability to work independently.
e) Be able to follow and interpret EU policies critically.

f) Be able to follow and interpret ideas and concepts of Europe and European integration critically.
g) Have an ability to communicate in own and an international language using the appropriate terminology.
h) Have an international mobility and cultural understanding.

Identification of level descriptors for the first and second cycle is based on a presumption of the existence of both Bachelors and Masters levels. However, since some universities have European Studies programmes only at either first or second cycle level, the specific level descriptors may be slightly modified.

Teaching, Learning, Assessment, Performance

While European Studies includes similar learning and teaching methods to those found in many of the other Tuning Project subjects, its distinctive multi-disciplinary and inter-disciplinary characteristics have some specific implications. Since the subject area aims to move towards greater inter-disciplinarity at more advanced levels, its pedagogy needs to reflect this goal. The following methods have relevance in this respect:

— simulation exercises,
— project work,
— inter-disciplinary seminars,
— teamwork,
— problem-based learning,
— multiple staffing, bringing different perspectives to problems, policies and themes,
— methodological and theoretical seminars,
— visiting speakers, representing professional practice,
— interdisciplinary bachelors and masters theses,
— internships in relevant organisations.

The above are used for illustrative purposes and the group stopped short of precise definition or prescription. It also noted that learning and teaching methods could reflect particular levels and modes of resource.

Conclusions

As is clear from the above analysis, European Studies programmes are usually organised according to the main subjects of the faculty/department in which the programme is based. Nor is it possible to identify differences between the *national* systems, since there are differences between universities within the same country. Since the general objective of any European core curriculum must be to keep a rich diversity of teaching and learning, attempts to bring about standardisation must be avoided.

The specified core competences should be obtained by students in ***core courses***, e.g. courses that create the backbone of European Studies. These courses should be accompanied by ***support courses***, which complement the core courses to the extent that they help to clarify particular aspects of the field and by ***specialisation courses*** (which are generally core courses in the home faculty/department).

Students should gain the core competences at any European studies programme. The nature of further specialisation is dependent on the subject area of the faculty/department in which the programme is based.

This approach will contribute to the development of an effective network among institutions providing European Studies programmes. The fact that, after obtaining common core competences at any European university, students may move to another university approaching European studies from a specialisation that they are seeking, could contribute to the creation of a network of universities for student exchange in the subject area.

Since it may be anticipated that the needs of EU administrative structures in «new» EU member countries will become saturated, we may expect continual change in the character of programmes at universities that currently concentrate on the training of experts.

Prepared by Libor Grega and Michael Newman

5.3. NURSING

Preliminary Considerations and background context

Nursing is the first health care regulated group and practical discipline to be included in the TUNING project. Indeed, as Agan (1987) pointed out, it is an occupation known by the action verb «nursing» rather than by a traditional neutral noun. Nursing is generally acknowledged to include both art and science drawing on knowledge and techniques derived from its own knowledge base and the established sciences and humanities.

The programmes designed to enable general nurses to practise in the discipline are subject to European General Directives, while other specialities in nursing are subject to the sectoral directives. These current regulations constrain any proposed changes (see Conseleg: 1977L0453 dated 31/7/2001). Nursing therefore faces the particular challenge of establishing common outcome competences for first and second cycle nursing programmes across a Pan European context where registration as a first level nurse is not uniformly associated with a required academic level outcome. The EU Directives are subject to national interpretation by the relevant «competent authority» and at present do not contain a list of competences. Rather they reflect their developmental origins in the early to mid 1970s in that they comprise a list of syllabus content and prescribed hours for clinical and theoretical instruction (for example theoretical and technical instruction in nursing, basic sciences and the social sciences; and clinical instruction in general and specialist medicine, general and specialist surgery, child care and paediatrics, maternity care, mental health and psychiatry, care of the old and geriatrics and home nursing). We consider that ECTS may be a major vehicle through which some of these historical anomalies may be addressed. ECTS and the TUNING methodology should facilitate a competence based framework with greater flexibility in an interprofessional and trans-professional health and social care environment. However the practical nature of the discipline requires level descriptors for practice. This has been one of the «Holy Grail» pursuits of nursing education and practice during the past twenty years!

Inevitably with the passage of time, while the EU Directives have contributed to a minimum standard of programme content and length, there has been a wide diversity in nursing courses both academically and professionally across the newly enlarged European Union. For example, the minimum academic level specified by the competent authority reveals first cycle programmes with registration[33] (Ireland); a programme equivalent to two thirds of a first cycle programme (England, Malta) and countries in transition from minimal higher education association to first cycle (Czech republic). Internationally, many countries have achieved —or are aspiring to attain— first cycle

[33] For the purposes of this paper, the term «registration» is used to denote the nurse who is deemed to have achieved the national qualification which complies with the General Nursing Directive. In some countries, the term «license to practise» may be used. The student nurse in this context is the one undergoing a course of study to achieve this qualification.

equivalence, frequently referred to as «graduate» status for nursing at registration level.

Within the professional /academic literature there is an extensive and established corpus of work concerning both the nature of nursing, nursing competence, nursing pedagogy, clinical learning and decision making and the struggles for professionalisation within a group that is predominantly female in many countries. Furthermore, nursing is often historically managed from Health rather than Education Ministries until Higher Education qualifications are associated with registration. At this point, there is usually a protocol which determines the nature of the collaboration between the two Ministries. While it is beyond the scope of this paper to address these numerous and complex issues, some points of reference for further detail will be identified. Box 1 offers some illustrative European definitions of the nature of nursing to guide the non specialist reader. To distinguish the different categories of nursing activity, we used the International Labour Organisation's guide (ILO, 1977) which identified three levels of nursing personnel. The first level, the professional nurse is the subject of this work and is someone who has the education and training «recognised as necessary for assuming highly complex and responsible functions and authorised to perform them».

Box 1: Some illustrative examples of definitions of nursing and nurses
«Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings. Nursing includes the promotion of health, prevention of illness, care of ill, disabled and dying people. Advocacy, promotion of a safe environment, research, participation in shaping health policy and in patient and health systems management, and education are also key nursing roles» (International Council of Nurses).
«A nurse is a person who has completed a programme of basic nursing education and is qualified and authorised in his/her country to practice nursing. Basic nursing education is a formally recognised programme of study which provides a broad and sound foundation for the practice of nursing and for post-basic education which develops specific competency. At the first level, the educational programme prepares the nurse, through the study of behavioural, life and nursing sciences and clinical experience, for effective practice and direction of nursing care, and for the leadership role» (Council of Europe, 1993, Glossary).

«The first level nurse is responsible for planning, providing and evaluating nursing care in all settings for the promotion of health, prevention of illness, care of the sick and rehabilitation; and functions as a member of the health team. In countries with more than one level of nursing personnel, the second level programme prepares the nurse, through the study of nursing theory and clinical practice, to give nursing care in co-operation with and under supervision of a first level nurse» (Basic Nurse Education —see «European Agreement of the Instruction and Education of Nurses» Council of Europe, 25 October 1967) Glossary of Council of Europe, 1993.

At the time of the original EU Directives, An Advisory Committee on Training in Nursing was set up by the Commission (see 77/454/EEC). This group has been stood down. Interestingly, one of the final reports of this group in 1998 (XV/D/8506/98-EN[34]) included recommendations for a skills /competence based framework; and to «move the entry requirements for the education and training of nurses responsible for general care towards a level which will allow access to higher or university education and training». When the Tuning project was launched, there was no common platform for activity related to the Nursing Directives and so while the work of the Tuning group is timely, it has to find, and sometimes create, the networks through which it may operate. At the time of writing however, the first meeting for a possible European Council of Deans (nursing) has been co-ordinated in Berlin 17-19th May 2004.

Following registration, many countries report limited opportunities for continuing education and specifically post graduate activity. The development of the profession is such that post graduate/second cycle studies are often undertaken in disciplines other than nursing or through «foreign» countries until the post graduate centres in nursing are established. The country profiles reveal the diversity and in some cases paucity of opportunities. Broadly speaking post graduate degrees for nurses fall into five categories:

- —Leadership, management and administration of health services.
- —Clinical nursing specialities with or without practice competences.
- —General nursing studies.

[34] European Commission Directorate General XV Document XV/D/8506/98/EN November 1998. Advisory Committee on Training in Nursing Reports and Recommendations Adopted by the Committee During its fourth and fifth terms of Office (5.2.1990 to 5.7.1998).

—Research methods in health.
—Nurse education.

In addition, nurses undertake interprofessional/multidisciplinary courses associated with health education, medicine or social care, for example studies in rehabilitation, nutrition, public health, counselling. In some countries, specialisation occurs as vocational training rather than university/higher education. In contrast, others are now developing «consultant nurses» at professional and /or doctoral (third cycle level). An eight hundred page report[35] was produced by the European Commission in 2000 analysing Specialist Nurses in Europe (XV/98/09/E). This study reviews the Profession of Nurse in the then member states giving general observations about the structure, characteristics and types of nurses within the EU. The main obstacles to mobility are identified and particular reference is made to «the direct entry of nurses with a limited sphere of training».

It is within this multifaceted and complex socio cultural and political context that the Tuning nursing group operate.

Methodology

Given that the current General Nursing Directive specifies neither an academic level nor competences as its outcome for entry to the labour market as «nurse», our first decision was to define our scope of reference from the following options:

1) Registration with first cycle competences followed by one of the following:
   a) Second cycle programme with higher order (or specialist) nursing practice competences or
   b) Second cycle programme with no higher order nursing practice competences.
2) First cycle competences following registration for all those nurses without a first cycle qualification. This may then be followed by one of the following:
   a) Second cycle programme with higher order nursing practice competences or
   b) Second cycle programme with no higher order nursing practice competences.

[35] (http://europa.eu.int/comm/internal_market/en/qualifications/nursesintro.htm)

We unanimously agreed to the establishment of competences for nursing practice and theory associated with option 1a above, namely the «graduate/bachelor/first cycle» academic status for nursing at the point of registration. During our first meeting two lists of competences were generated:

1) Generic «nursing» academic competences common to the participating countries.
2) A compilation of subject specific nursing competences that included the UK benchmark statements for nursing and any competences or standards defined in the member countries (e.g. the work of Eskola and Palopsoki in Finland).

The forty competences produced from this exercise were then distributed as a questionnaire to the Tuning members who were asked to specify the academic level that should accompany them and the extent to which they should be included within a registration programme. To do this, we needed to work to a common definition of competence and adopted that defined by the Nursing and Midwifery Council of the United Kingdom (2000), namely that competence is «the skills and ability to practise safely and effectively without the need for direct supervision». Given the interpersonal nature of nursing, we were particularly mindful of attributes and competences associated with values, attitudes and communication skills a few of which are outlined in Box 2.

Box 2: Relevant definitions of competence pertinent to nursing

«a complex combination of knowledge, attitudes and values which are needed for safe, intelligent performance in specific situations» (Gonzi, 1994).

«a level of performance demonstrating the effective application of knowledge, skill and judgment» (ICN, 1997:44).

«Competence is the state of having the knowledge, skills, energy, experience and motivation required to respond adequately to the demands of one's professional responsibility» (Roach, 1995:172).

«The ability to carry out a certain professional function which is made up of a repertoire of professional practices. Competence requires knowledge, appropriate attitudes and observable mechanical or intellectual skills, which together account for the ability to deliver a specified professional service» (WHO, 1988:68).

Feedback from this preliminary questionnaire enabled the list of competences to be reduced to 22 elating to a first cycle course with registration. This list was subject to two more iterations that enabled further refinement and was more amenable to national interpretation. During this period, the competences were compared with other national/international competence statements or standards and some minor adaptations were made to ensure a better degree of alignment (e.g. with International Council of Nursing (ICN)). With respect to nomenclature, the term «patient» was used to represent both «patients and/or clients». Finally, the agreed list of 21 competences (see Table 1) was produced and categorised under the five domains of:

- —Professional Values and the role of the nurse.
- —Nursing Practice and clinical decision making.
- —Knowledge and cognitive competences.
- —Communication and interpersonal competences (including technology for communication or «health informatics»).
- —Leadership, management and team competences.

These competences reflect the evolving and changing nature of health and social care and the rapid emergence of technology, and interprofessional activity (se WHO, 1997). We were mindful of Barr's (1998) definitions of types of competences used in interprofessional contexts, namely the importance of distinguishing between common, collaborative and core competences. Pragmatically it was recognised that due to the complex intersubjective, nature of nursing praxis, these competences were often multifaceted and could be exhibited in isolation or in conjunction with one another during particular episodes of care. In effect we were adopting Carr's (1993) two considerations of competence, namely its capacity and disposition. Capacity it is argued refers to the evaluation of persons and dispositions refers to the activities undertaken. The concept of capability is also crucial, because programme achievement provides entry to the labour market and the demands of ethical, accountable health care practice. Establishing competence therefore must acknowledge the extent to which the student is capable of being a competent registered practitioner and is *likely* to be judged so by current performance.

Issues of translation

There were some specific problems with translation in so far as not all concepts are easily translated, and indeed it is known that the word «nurse» itself is not indigenous to all languages. We are grateful therefore to those Tuning members who arranged translated versions for their home countries. This is a recognized problematic for the study of nursing.

Table 1

The original competences

Competences associated with the professional values and the role of the nurse
1) Practises within the context of professional, ethical, regulatory and legal codes, recognising and responding to moral/ethical dilemmas and issues in day to day practice.
2) Practices in a holistic, tolerant, non judgmental, caring and sensitive manner, ensuring that the rights, beliefs and wishes of different individuals and groups are not compromised.
3) Educates, facilitates, supports and encourages the health, well-being and comfort of populations, communities, groups and individuals whose lives are affected by ill health, distress, disease, disability or death.
4) Is aware of the different roles, responsibilities and functions of a nurse, and is able to adjust their role to respond effectively to population/patient needs. Where necessary and appropriate is able to challenge current systems to meet population/patient needs.
5) Accepts responsibility for his/her own professional development and learning, using evaluation as a way to reflect and improve upon on his/her performance and to enhance the quality of service delivery.
Competences associated with nursing practice and clinical decision making
6) Undertakes comprehensive and systematic assessments using the tools/frameworks appropriate to the patient/client taking into account relevant physical, social, cultural, psychological, spiritual and environment factors.
7) Able to recognise and interpret signs of normal and changing health/ill health, distress, or disability in the person (assessment/diagnosis).
8) Responds to patient/client needs by planning, delivering and evaluating appropriate and individualised programmes of care working in partnership with the patient/client, their carers, families and other health/social workers.

9)	Able to critically question, evaluate, interpret and synthesis a range of information and data sources to facilitate patient choice, and to make sound clinical judgments to ensure quality standards are met and practice is evidence based.
10)	Able to appropriately use a range of nursing skills, interventions/activities to provide optimum care. For example: a) maintains patient/client dignity, privacy and confidentiality; b) practise principles of health and safety, including moving and handling, infection control; essential first aid and emergency procedures; c) safely administers medicines and other therapies; d) considers emotional, physical and personal care, including meeting the need for comfort, nutrition, personal hygiene and enabling the person to maintain the activities necessary for daily life; e) responds to individuals needs through the life span and health/illness experience e.g. pain, life choices, revalidation, invalidity or when dying; f) informs, educates and supervise patient/carers and their families.
	Knowledge and cognitive competences
11)	Has relevant knowledge of the following and can appropriately apply this knowledge to nursing practice, patient care and situations of uncertainty: a) Theories of nursing and nursing practice b) Natural and life sciences c) Social, health and behavioural science d) Ethics, law and humanities e) Technology and health care informatics f) International and national policies g) Problem solving and decision making h) Principles of research and enquiry
	Communication and interpersonal competences (including technology for communication)
12)	Able to communicate effectively (including the use of technology): with patients, families and social groups, including those with communication difficulties.
13)	Enables patients and their carers to express their concerns and worries and can respond appropriately e.g. emotional, social, psychological, spiritual or physical.
14)	Able to appropriately represent the patient/client's perspective and act to prevent abuse.

15)	Can use a range of communication techniques to promote patient well being. For example the ability to appropriately: a) use counselling skills; b) identify and manage challenging behaviour; c) recognise anxiety, stress and depression; d) give emotional support and identify when specialist counselling or other interventions are needed
16)	Able to accurately report, record, document and refer care using appropriate technology.
	Leadership, management and team competences
17)	Realises that patient/client well-being is achieved through the combined resources and actions of all members of the health/social care team, and is able to lead and co-ordinate a team, delegating care appropriately.
18)	Able to work and communicate collaboratively and effectively with all support staff to prioritise and manage time effectively while quality standards are met.
19)	Able to assess risk and actively promote the well-being, security and safety of all people in the working environment (including themselves).
20)	Critically uses tools to evaluate and audit care according to relevant quality standards.
21)	Within the clinical context, is able to educate, facilitate, supervise and support health care students and other health/social care workers.
22)	Is aware of the principles of health/social care funding and uses resources effectively

The survey

As Table 1 demonstrates, some of the competences incorporated sub sections or illustrative points and were thus not amenable to a formal survey. Statements were derived which could be ranked by the respondents. In order to survey the competences as a whole, they were translated into the 40 summarised in Table 2. To address the possible confusion related to the levels of nursing, we included the following statement:

Indicate how important you think it is that a student should acquire the competence in his/her education for the First Cycle when *accompanied by registration/licence to practice as a professional registered nurse (International Labour Organisation first level nurse and EC Directive 1977/453).*

Table 2

The statements for survey purposes
(Those marked * were notably ranked differently for first and second cycle)

SPECIFIC COMPETENCES
Competences associated with professional values and the role of the nurse
1. Ability to practise within the context of professional, ethical, regulatory and legal codes, recognising and responding to moral/ethical dilemmas and issues in day to day practice.
2. Ability to practise in a holistic, tolerant, non judgmental, caring and sensitive manner, ensuring that the rights, beliefs and wishes of different individuals and groups are not compromised.
3. Ability to educate, facilitate, support and encourage the health, wellbeing and comfort of populations, communities, groups and individuals whose lives are affected by, ill death, distress, disease, disability or death*.
4. Awareness of the different roles, responsibilities and functions of a nurse.
5. Ability to adjust their role to respond effectively to population/patient needs. Where necessary and appropriate is able to challenge current systems to meet population/patient needs*.
6. Ability to accept responsibility for his/her own professional development and learning, using evaluation as a way to reflect and improve upon on his/her performance and to enhance the quality of service delivery.
Competences associated with nursing practice and clinical decision making
7. Ability to undertake comprehensive and systematic assessments using the tools/frameworks appropriate to the patient/client taking into account relevant physical, social, cultural, psychological, spiritual and environment factors.
8. Ability to recognise and interpret signs of normal and changing health/ill health, distress, or disability in the person (assessment/diagnosis).

9.	Ability to respond to patient/client needs by planning, delivering and evaluating appropriate and individualised programmes of care working in partnership with the patient/client, their carers, families and other health/social workers.
10.	Ability to critically question, evaluate, interpret and synthesis a range of information and data sources to facilitate patient choice*- marked difference.
11.	Ability to make sound clinical judgments to ensure quality standards are met and practice is evidence based*—marked difference.
	Ability to appropriately use a range of nurse skills, interventions/activities to provide optimum care
12.	Ability to maintain patient/client dignity, advocacy and confidentiality (using nursing skills, interventions/activities to provide optimum care).
13.	Ability to practice principles of health and safety, including moving and handling, infection control; essential first aid and emergency procedures; (using nursing skills, interventions/activities to provide optimum care).
14.	Ability to safely administer medicines and other therapies; (using nursing skills, interventions/activities to provide optimum care).
15.	Ability to consider emotional, physical and personal care, including meeting the need for comfort, nutrition, personal hygiene and enabling the person to maintain the activities necessary for daily life; (using nursing skills…).
16.	Ability to respond personals' needs through the life span and health/illness experience e.g. pain, life choices, revalidation, invalidity or when dying; (using nursing skills, interventions/activities to provide optimum care).
17.	Ability to inform, educate and supervise patient/carers and their families. (using nursing skills, interventions/activities to provide optimum care)*.
	Knowledge and cognitive competences (a tendency to incremental development at second cycle)
18.	Knowledge of and ability to apply theories of nursing and nursing practice*.
19.	Knowledge of and ability to apply natural and life sciences*.
20.	Knowledge of and ability to apply social, health and behavioural science*.
21.	Knowledge of and ability to apply ethics, law and humanities*.

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22.	Knowledge of and ability to apply technology and health care informatics*.
23.	Knowledge of and ability to apply international and national policies*-marked difference.
24.	Knowledge of and ability to apply problem solving and decision making.
25.	Knowledge of and ability to apply principles of research an enquiry*-marked difference.
	Communication and interpersonal competences (including technology for communication)
26.	Ability to communicate effectively (including the use of technology): with patients, families and social groups, including those with communication difficulties.
27.	Enables patients and their carers to express their concerns and worries and can respond appropriately e.g. emotional, social, psychological, spiritual or physical.
28.	Ability to appropriately represent the patient/client's perspective and act to prevent abuse.
29.	Ability to appropriately use counselling skills; (communication techniques to promote patient well being).
30.	Ability to identify and manage challenging behaviour (communication techniques to promote patient well being).
31.	Ability to recognise anxiety, stress and depression (communication techniques to promote patient well being).
32.	Ability to give emotional support and identify when specialist counselling or other interventions are needed (communication techniques to promote patient well being).
33.	Ability to accurately report, record, document and refer care using appropriate technologies. (communication techniques to promote patient well being).
	Leadership, management and team competences ** all in this section marked difference at second cycle*
34.	Ability to realise that patient/client well-being is achieved through the combined resources and actions of all members of the health/social care team. *-marked difference

35.	Ability to lead and co-ordinate a team, delegating care appropriately*- marked difference.
36.	Ability to work and communicate collaboratively and effectively with all support staff to prioritise and manage time effectively while quality standards are met*-marked difference.
37.	Ability to assess risk and actively promote the well-being, security and safety of all people in the working environment (including themselves)*- marked difference.
38.	Critically uses tools to evaluate an audit care according to relevant quality standards*- marked difference.
39.	Within the clinical context, ability to educate, facilitate, supervise and support health care students and other health/social care workers *- marked difference.
40.	Awareness of the principles of health/social care funding and users resources effectively*- marked difference.

Findings and analysis

Generic competences

The most distinguishing, but not surprising, feature of the generic academic competences is the marked first preference for the capacity to apply knowledge to practice as being the most important competence. The remaining competences were clustered in six groups with interchangeable ranking within the group. The second group comprised ethical commitment and the skills of analysis, synthesis, problem solving and interpersonal skills. The third group predominantly comprised skills relating to the capacities to learn, reflect, adapt and make decisions in an interdisciplinary context. The least important competence was knowledge of a second language, while skills associated with leadership, management, research and enterprise were found in the fifth and sixth groups. Not withstanding these differences, the lowest score ranking was 2.9 for three competences, while all the rest were over 3, that is to stay the majority of the competences were rated as being at least «considerably» important.

With respect to the second cycle, each competence gained in importance with the most marked difference being in the competences that were in the fifth and sixth groupings, namely leadership, management, research where they have an increased importance. Once again, these are not surprising findings and reflect the natural career progression of a registered nurse.

Specific competences

First cycle

It is important to note that the mean scores for the importance of each of these competences is at least 2.6 (minimum range at 2.3), with 33 competences being ranked 3 or over. The competences rated below 3 were once again those associated with policy, leadership, evaluation, fiscal matters, research, supervision and the assessment of risk. These are all competences that one would **not** expect a student to be experiencing with any degree of autonomy. Indeed, ethically and professionally it would not be appropriate for them to do so.

Second cycle

Table 2 indicates where there were marked differences between the first and second cycle mean ratings. The responses were all within the range of 3.5 or above indicating that the competences are very important for professional practice and its study. While the highest ranking competence at 3.9 demonstrated the importance of self reflection, accountability and continuous learning (no 6), the top 8 scores were associated with competences associated with the professional role of the nurse, leadership and management and problem solving.

Differences between first and second cycle rankings reflect the nature of professional practice and its study. In some areas an acquired competence would be expected to be sustained (e.g. health and safety, medications), in others its importance would gain significance (leadership, management, research, communication) and in others the development would be incremental (nursing practice, decision making, knowledge).

Given the tendency for agreement within these results, there would appear to be a degree of consensus as to the competences that are appropriate at first and second level for a degree associated with registration and its subsequent development. Country differences did not appear significant, tending to reflect cultural differences and the developmental stage of nursing within that country (for example knowledge of a second language and the ordering of research skills). Further work is now required to refine the competences as a consequence of stakeholder consultation.

Annex 1 summarises the findings from Spain, where the competence component of the Tuning methodology was applied within the nursing profession.

Stakeholder engagement

This aspect of the methodology is not as yet completed and is the subject of ongoing work. The Tuning members have been appropriately consulting within their own countries according to the national cultural and political traditions. To address stakeholder involvement across the newly enlarged EU is an ambitious but necessary undertaking if the Tuning work is to have practical outcomes. This is the challenge of a regulated group! The possible stakeholders to be engaged include:

— Other Higher Education institutions in countries not represented by the Tuning membership.
— Chief Nursing Officers of the Member states, and through them the relevant Health Ministries and employers.
— The competent authorities.
— The professional associations and trade unions significantly representing nurses.
— Student associations.

In addition, there is a significant case for involving service users. At the next meeting of Tuning, we will be refining our strategy to enable maximum involvement within the available resources. There is ongoing collaborative dialogue with the thematic network for nursing.

Conclusion

As this paper has demonstrated, there appears to be a degree of consensus concerning the nature of nursing practice, albeit that the manner of implementation would be person and context specific. The challenge now remains as to how these competences could be translated by level descriptors and performance indicators to meaningfully represent equivalence of standard in practice and client care. The work to date has not identified the level at which each competence needs to be demonstrated at the end of the first or second cycle!

Prepared by Mary Gobbi

ANNEX 1
Spanish case study- prepared by Concha Germán

Spanish Nursing ANECA study
C Germán, L Bernués, M Peya. Primeros resultados del Borrador del Estudio ANECA de Enfermería. Competencias y Perfiles. Universidades de Zaragoza y de Barcelona. 2004.

In 2003, the Spanish Agency for Quality Assurance and Accreditation commenced surveys to establish generic and specific competences in nearly all disciplines. The nursing survey involved nearly 2200 nurses of whom 50% were clinical, 25% were managers and the rest were nurse academics/educators. The study results demonstrated agreement between managers, teachers and clinical nurses on the generic competences of creativity, motivation, problem solving, independent work, team work and quality with managers giving a statistical difference for items concerning decision making, leadership skills, project management and communication skills. With respect to the specific competences, the majority (31) of the competences for the first cycle were ranked in a similar way to those of e original nursing TUNING survey. Where there were differences, analysis indicates that these reflect the socio cultural and historical contexts of Spain and the emphasis of care- for example with respect to more sensitivity to patient education and administration of drugs and therapies reflecting perhaps a more dominant biomedical approach in Spain.

Annex 2
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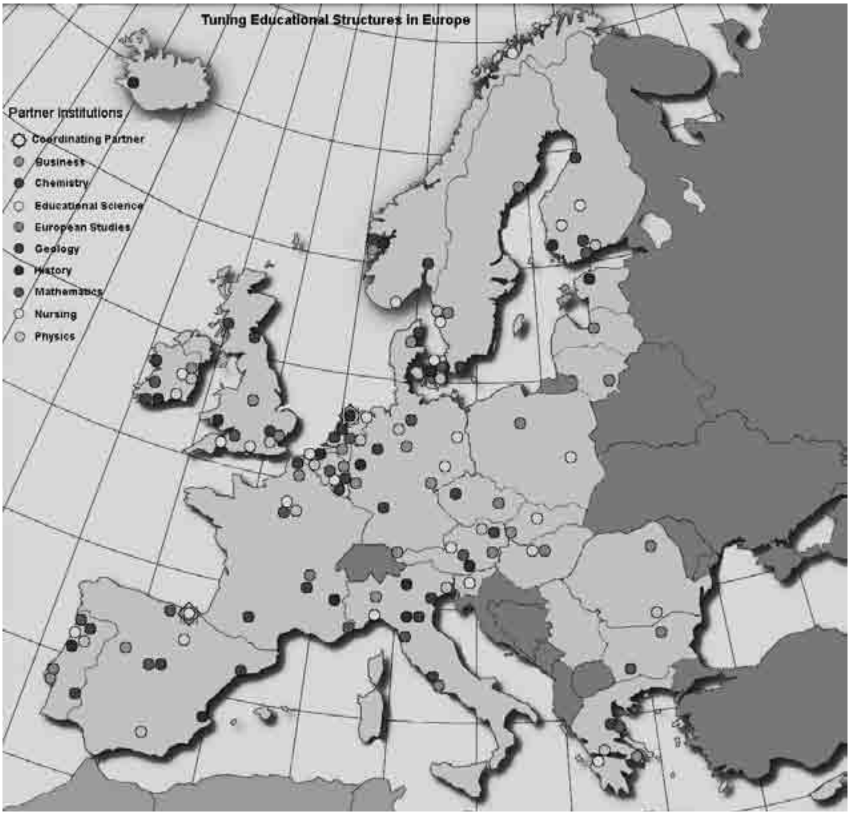
6

Participants and Organisational Structure

6.1. MAP OF INSTITUTIONS



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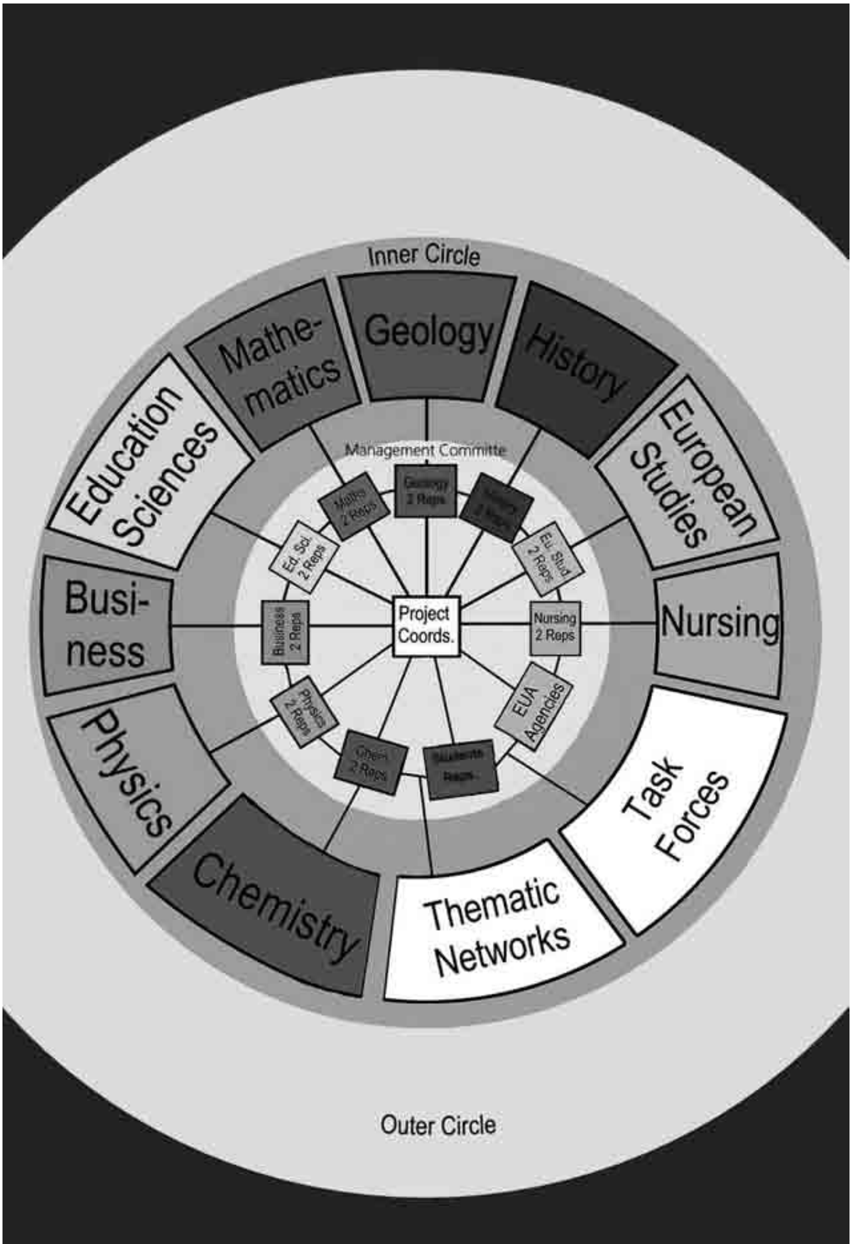
6.3. ORGANIZATIONAL STRUCTURE



7

Goldmine: relevant Websites and Bibliography

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— *Trends in Learning Structures in Higher Education (II)*
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http://www.eurydice.org/Documents/Fiches_nationales/en/frameset_EN.html

Organisations

— ERASMUS: Thematic Network Projects
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http://europa.eu.int/comm/education/programmes/mundus/index_en.html

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and
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http://www.eurashe.be

— UNESCO-CEPES
http://www.cepes.ro

— ACA - Academic Cooperation Association
http://www.aca-secretariat.be

— ESIB - The National Unions of Students in Europe
http://www.esib.org

— International Association of Universities
http://www.unesco.org/iau

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— Center for Higher Education Policy Studies (CHEPS)
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or National Reports 2003
or National Higher Education Acts

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>Agenda>18 Oct. 2004

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— Diploma supplement. E.C.
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Recognition issues

— Recognition of diplomas
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— NARIC
http://europa.eu.int/comm/education/programmes/socrates/agenar_en.html

— *The European gateway to recognition of academic and professional qualifications*
ENIC/NARIC net
http://www.enic-naric.net/

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— The National Qualifications Authority of Ireland
http://www.nqai.ie

— The National Qualifications Framework for England, Wales and Northern Ireland (NQF)
http://www.qca.org.uk/493.html

— The Scottish Qualifications Authority
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Quality Assurance

— European Network for Quality Assurance in Higher Education
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8

Glossary

Assessment
The total range of written, oral and practical tests/examinations, projects and portfolios, used to evaluate the student's progress in the course unit or module, form an assessment. These measures may be used by the students to evaluate their own progress (formative assessment) or by the institution to judge whether the student has achieved the learning outcomes of the course unit or module (summative assessment).

Assessment criteria
Descriptions of what the learner is expected to do, in order to demonstrate that a learning outcome has been achieved.

Cohort
The group of students that started a particular degree programme in the same year is known as a cohort.

Competences
Competences represent a dynamic combination of knowledge, understanding, skills and abilities. Fostering these competences is the object of educational programmes. Competences are formed in various course units and assessed at different stages. They may be divided in subject-area related competences (specific to a field of study) and generic competences (common to any degree course).

Condoning
Condoning is the term used when an examination board exempts a student from reassessment in a failed module if the other related modules are passed with sufficiently high marks.

Contact hour
A period of 45-60 minutes of teaching contact between a staff member and a student or group of students is defined as a contact hour.

Continuous assessment
Continuous assessment refers to the situation where assessment as described above takes place within the normal teaching period and contributes to the final assessment.

Convergence
Convergence involves the voluntary adoption of suitable policies for the achievement of a common goal. Convergence in the architecture of national educational systems is pursued in the Bologna process.

Course unit
A self-contained, formally structured learning experience. It should have a coherent and explicit set of learning outcomes, expressed in terms of competences to be obtained, and appropriate assessment criteria. Course units can have various numbers of credits, however see «module»

Coursework
Coursework defines required tasks within a course unit or module.

Credit
A quantified means of expressing the volume of learning based on the achievement of learning outcomes and their associated workloads measured in time.

Credit accumulation
In a credit accumulation system a specified number of credits must be obtained in order to complete successfully a semester, academic year or a full study programme, according to the requirements of the programme. Credits are awarded and accumulated only when the successful achievement of the required learning outcomes is confirmed by assessment.

Credit framework
A system that facilitates the measurement and comparison of learning outcomes achieved in the context of different qualifications, programmes of study and learning environments on the basis of student workload measured in time.

Credit level
Credit level is an indicator of the relative demands of learning and of learner autonomy. It can be based on the year of study and/or on the type of course content (for example, Basic/Advanced/Specialised).

Credit type
Credit type provides an indicator of the status of a course unit or modules in the study programme. It can for example be described as Core (major course unit), Related (unit providing instrument/support) or Minor (optional course unit).

Cycle
A cycle is a course of study leading to an academic degree. One of the objectives indicated in the Bologna Declaration is the «adoption of a system based on two main cycles, undergraduate and graduate.» Doctoral studies are now generally referred to as the third cycle.

Cycle descriptor
Generic statements of the expected outcomes of a period of study that equals one of the three cycles as identified in the Bologna Process. Such a descriptor provides clear points of references that describe the outcome of a degree programme.

Degree / Diploma
Degree describes the qualification awarded by a higher education institution after successful completion of a prescribed study programme. In a credit accumulation system the programme is completed through the accumulation of a specified number of credits awarded for the achievement of a specific set of learning outcomes.

Diploma Supplement
The Diploma Supplement is an annex to the official degree/qualification designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the holder of the degree/qualification. It is based on the model developed by the European Commission, Council of Europe and UNESCO/CEPES. It improves international transparency and the academic/professional recognition of qualifications.

Doctorate or Doctoral Degree
A high level qualification which is internationally recognised as qualifying someone for research or academic work may be designated as a doctorate or doctoral degree. It will include a substantial amount

of original research work which is presented in a thesis. It generally refers to the degree awarded after completion of third cycle studies.

ECTS (European Credit Transfer and Accumulation System)
The European Credit Transfer and Accumulation System (ECTS) is a student-centred system based on the *student workload* required to achieve the objectives of a programme of study. These objectives should be specified in terms of *learning outcomes and competences* to be acquired. ECTS is based on the principle that 60 credits measure the workload of a full-time student during one academic year. The student workload of a full-time study programme in Europe amounts in most cases to around 1500-1800 hours per year and in those cases one credit stands for around 25 to 30 working hours.
ECTS is a system for increasing the transparency of educational systems and facilitating the mobility of students across Europe through credit accumulation and transfer. Credit transfer is guaranteed by explicit agreements signed by the home institution, the host institution and the mobile student.

Examination (Exam)
The term examination normally refers to a formal written and/or oral test taken at the end of a course unit or module or later in the academic year. Other assessment methods are also in use. Tests within the course unit or module are classed as continuous assessment if they contribute to the final assessment.

First degree
A first cycle qualification, as defined by the Bologna Declaration, normally awarded after successful completion of a minimum of three years or 180 ECTS credits is designated a first degree.

Grade
A final evaluation based on the overall performance within an individual course unit or module in the study programme.

Graduate studies
A course of study undertaken after completion of a first degree and which normally leads to a second cycle degree.

Higher education
Higher education applies to programmes of study that may be entered by students holding either an appropriate school leaving certificate from an

upper secondary school after, in general, twelve years of schooling or other relevant professional qualifications or other approved prior learning and/or prior experience. Providers may be universities, universities of professional studies, higher education institutions, colleges, polytechnics etc.

ICT teaching
ICT teaching includes teaching/studying/learning that make use of information and communication technology. It usually takes place in e-learning environments.

Learning outcomes
Learning outcomes are statements of what a learner is expected to know, understand and/or be able to demonstrate after completion of a process of learning. Learning outcomes must be accompanied by appropriate assessment criteria which can be used to judge that the expected learning outcomes have been achieved. Learning outcomes, together with assessment criteria, specify the requirements for the award of credit, while marking is based on attainment above or below the requirements for the award of credit. Credit accumulation and transfer is facilitated if clear learning outcomes are available to indicate with precision the achievements for which the credit will be awarded.

Learning time
The number of hours an average student will need to achieve specified learning outcomes and gain credits to be awarded after assessment.

Levels
Represent a series of sequential steps (a development continuum) expressed in terms of range of generic outcomes, against which typical qualifications can be positioned.

Mark
A mark is any numerical or qualitative measure used to describe the results of assessment in an individual course unit or within a well-defined scale.

Module
In Tuning, the term module refers to a course unit in a modularized system, that is a system based on course units carrying a uniform number of credits (usually 5 or 6) or a multiple of that number.

National framework of qualifications
The single description at national level, which is internationally understood and through which all qualifications and other learning achievements may be described and related to each other in a coherent way and which defines the relation between qualifications.

Optional course
A course unit or that may be taken as part of a study programme but is not compulsory for all students is referred to as optional.

Profile
A specific subject related field of learning leading to a qualification.

Qualification
Any degree, diploma or other certificate issued by a competent authority attesting the successful completion of a recognised programme of study.

Study programme
An approved set of course units or modules recognised for the award of a specific degree form a study programme and can be defined through the set of learning outcomes to be achieved for the award of a specified number of credits.

Reference points
Non-prescriptive indicators formulated as learning outcomes expressed in terms of competences that support the articulation of qualifications (degree programmes).

Recognition
Recognition within ECTS requires that the credits achieved by a student through successful completion of course units or modules as described in the Learning Agreement at the host university must replace an equivalent number of credits at his/her home institution.

Resit examination (Exam) or Assessment
Students who have not been able to take or pass an Examination or assessment on the first date scheduled may be offered the opportunity to take a resit examination or assessment at a later date.

Second cycle degree
A second cycle degree is a higher education qualification awarded after the successful completion of second cycle studies and may involve

some research work. A student normally takes it after completion of a first degree.

Skills
Skills are abilities formed in learning activities which can be divided into «subject specific» and «generic».

Student workload
A quantitative measure of learning activities that may feasibility be required for the achievement of the learning outcomes in the given timeframe (e.g. lectures, seminars, practical work, information retrieval, private study, independent research, examinations).

Thesis
A thesis is a formally presented written report, based on independent research work, which is required for the award of a degree (generally second degree or doctorate).

Tuning
To «tune» means to synchronise a radio on the desired frequency; it means «tuning» the various instruments in an orchestra so that music can be played without unwanted dissonance. In the case of the Tuning Project, it means creating agreed reference points for the organisation of higher education structures in Europe, recognising that the diversity of traditions is a positive factor in the creation of a dynamic common higher education area.

Tutorial
A tutorial is a period of instruction given by a tutor aimed at exploring in greater depth, revising and discussing material and topics presented within a course unit or module.

Undergraduate studies
Undergraduate studies are defined as those normally carried out prior to the award of a first degree.

Workload
See student workload

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