INFORMATICS EUROPE

# INFORMATICS EDUCATION IN EUROPE:
Institutions, degrees, students, positions, salaries.

## Key Data 2010-2015

Cristina Pereira

# Informatics Education in Europe: Institutions, Degrees, Students, Positions, Salaries. Key Data 2010-2015

## An Informatics Europe Report

*Informatics Education in Europe: Institutions, Degrees, Students, Positions, Salaries. Key Data 2010-2015*

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## ABOUT THIS REPORT

The publication in 2013 of the first Key Data Report on Informatics Education in Europe, covering the 2008-2012 period, was a milestone event. For the first time, policy makers, education and research professionals and the general public could obtain precise information on the state of education in the area of highest importance for the future of Europe: Information Science and Technology. Instead of relying on rumors and guesses, discussions and decisions could now take advantage of verified data on the key parameters in various countries, beginning with the exhaustive list of institutions offering education in the field and continuing with a precise description of the degrees offered, the student and graduates numbers at every level, with distribution by gender, the maze of faculty and researcher positions and titles, and the most controversial topic of all: faculty and researcher salaries. Encouraged by the community's enthusiastic reception, we have continued, updated and improved the work, enlarging its scope and coverage, producing every year, since 2013, an annual edition of this report.

Like its predecessors, this report, the fourth edition of the series, emanates not from a government body or a group with a specific political agenda, but from academics in the field, represented by Informatics Europe (the association of academic and industrial research institutions in Computer and Information Sciences), with the sole purpose of furthering the understanding of the discipline's parameters through the provision of basic, factual data.

**Informatics Education in Europe: Institutions, Degrees, Students, Positions, Salaries. Key Data 2010-2015** provides an impressive picture of the state of Informatics education in Europe today. Based on an enormous amount of information from representative countries, it presents a wealth of fundamental data, starting from a list of institutions awarding degrees in the field and continuing with student enrollments, degrees awarded, gender information, academic titles, as well as precise and much-needed data about academic salaries across European countries.

This fourth edition has added a number of countries to those already covered. Thanks to the active participation of new collaborators, acknowledged below, the report now covers Belgium, Estonia, and Romania in addition to the countries in the previous edition (Austria, Denmark, Germany, Greece, Ireland, Italy, Latvia, The Netherlands, Spain, Switzerland, UK, and France for salaries).

The Informatics Key Data report series will continue to provide the community with the precise and objective information that is indispensable for understanding the field and making informed, effective policy decisions.

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# Table of Contents

# Executive Summary

Informatics, the science behind Information Technology (IT), is a core enabler of Europe's future success. Crucial to that success is the availability of superb Information and Computer Sciences education throughout Europe.

In this report series, the first to attempt a general study of the state of the art in European Informatics higher education, the emphasis is on raw facts and figures rather than deep analysis; it provides the material for such analyses that others may wish to perform. Nevertheless, a number of salient points emerge:

- The field in Europe suffers from a **serious branding problem**. Even after an approximate translation to English, a good dozen terms are used to denote what is fundamentally the same discipline.

- The quantity and quality of available data varies considerably from country to country. In the interest of reliability, this report has mostly used data from countries where a solid and reasonably complete picture could be drawn from official sources. Even when available, the data does not always allow direct comparisons, since definitions and methods of collection vary significantly from country to country. It is very important for the field to ensure that **consistent, solid Informatics education data becomes available in all European countries**.

- Informatics is a well-developed academic field, with **hundreds of accredited institutions** training huge numbers of students for bachelor, master and PhD degrees.

- Extrapolating from precise data in specific countries, we come to a rough estimate that:

    - more than two hundred and fifty thousand new students enroll each year in an Informatics Bachelor program in Europe.

    - overall close to a million students are enrolled in Informatics bachelor's programs across Europe; the corresponding estimated figure for master students is close to two hundred thousand.

    - more than a hundred thousand students graduate each year in an Informatics Bachelor program in Europe; the corresponding estimated figure for master graduates is close to fifty thousand.

- **Female students are strongly underrepresented in Informatics studies in Europe**. **At the bachelor level**, in all countries included in this report, excluding Romania, Greece and Estonia, **80% or more of the students enrolled or graduating in Informatics bachelor programs are male**. At the master level, female participation increases in some countries, but decreases in others; only in Romania, Greece, Estonia, Denmark, Ireland Latvia and the UK female participation in master studies exceeds 20%. No significant progress in female participation is observed over the past six years.

- In almost all countries included in this report **the number of students graduating every year is less than half of the number of new enrolled students**. Students in Informatics are either taking an unusually long time to conclude their studies successfully or not concluding them at all. We don't know how completion rates compare with other disciplines.

- The **status of faculty** varies considerably across Europe. **The salaries vary even more**. Our detailed study of the salaries of faculty in twelve European countries **shows, for a similar faculty position, a difference in salaries that can reach a factor of ten or more.** For example, a full professor at the top level receives, in some countries, the salary of a high-level industry executive, whereas in others the compensation is more comparable to that of a junior engineer in the IT industry.

# 1 Introduction

The quality of higher education in Informatics, the science behind IT [1], is critical to the future of Europe. Guaranteeing and improving this quality is of paramount concern to the Informatics community; it is part of the mandate of Informatics Europe, the association of university departments and industrial research laboratories in the field, to help achieve this goal.

Any coherent attempt at improvement must begin with a clear understanding of the current situation, supported by credible qualitative and quantitative data[2]. Examples of fundamental questions that can only be answered seriously by relying on such data include:

- What exactly makes up an Informatics education program, and under what other names can such programs be found?
- What degrees are available, and how do they compare across countries?
- How many students are studying for such degrees?
- How have these student enrollment numbers evolved in response to the ups and downs of the economy and of the popular perceptions of IT, for example as a result of concerns about outsourcing?
- Are there significant differences in the state of education in different European countries? Differences with other industrialized countries such as the USA, Japan, or Australia?
- What are typical salaries in Informatics for PhD students, postdoctoral researchers, assistant professors, associate professors, full professors and other ranks for educators and researchers?

The example of the Computing Research Association's surveys in the USA — such as the annual "Taulbee Survey" on Informatics PhDs — shows that providing well-supported data can play a crucial role in the development of the community and the discipline.

Until the publication of the first Informatics Europe Key Data report in 2013, there had not been any concerted effort at a Europe-wide collection of data that would permit answering such questions on a trans-national basis. Some national repositories of data exist, but they do not readily give a general European perspective: they can be hard to find; they are at different levels of advancement, some detailed, others partial; they do not necessarily measure exactly the same things, sometimes with subtle differences; they are based on different methodologies; and, naturally enough in light of Europe's diversity, they use different languages.

The present report is the continuation of this concerted effort to provide the European Informatics community with solid information on the state of higher education. It concentrates on the following key aspects:

- Names of the "Informatics" subjects in various countries (Section 3).
- Detailed description of the different national higher education systems (Section 4)
- Student enrollment and gender information (Section 5).
- Degrees awarded and gender information (Section 6).
- Academic positions (Section 7).
- Academic salaries (Section 8).
- List of institutions teaching Informatics (Appendix A).

In this fourth edition we were able to include three new countries: Belgium, Estonia and Romania. We hope to continue expanding the country scope in the following years, with the rule that countries can only be included under the condition that precise, verified data is available. We welcome contributors willing to work on providing such data.

[1] Another term for Informatics, prevalent in the USA, is "Computer Science". For other alternative names, see Section 3.
[2] Here and in the rest of this report we follow the practice of using "data" as a singular noun.

# 2 Sources of data

## 2.1 Methodology

There is no European-wide source for data relative to the topics of this report. It consequently relies on national data repositories. Not all countries, however, have equally accessible and credible repositories.

One possible choice would have been to attempt to cover all European countries, using whatever data one can find in each case. The clear disadvantage of this approach is that the quality of the result may be determined by the quality of the weakest source. Instead, the choice was made to **limit the study to countries for which reliable statistical data was available in accessible form.** To complement this approach, some extrapolations are made to the Europe-wide situation, using simple indicators; these are only extrapolations, and should be viewed with caution.

The methodologies for data collection, analysis and reporting (documented on the web site of the organizations consulted) vary, adding to the general difficulty of cross-country comparisons.

## 2.2 Data sources for subjects, student enrollments, degrees and institutions

For subjects, student enrollments, degrees and institutions (Sections 3, 5, 6 and Appendix A) the report concentrates on thirteen countries for which reliable data is available from official organizations:

- Austria: *Bundesministerium für Wissenschaft, Forschung und Wirtschaft* (www.en.bmwfw.gv.at)
- Belgium: Conseil des recteurs (www.cref.be); ETNIC (www.etnic.be), Onderwijs en Vorming (www.ond.vlaanderen.be/hogeronderwijs)
- Denmark: *StatBank Denmark* (www.statbank.dk)
- Estonia: Eesti Hariduse Infosüsteem (www.haridussilm.ee)
- Germany: *Statistisches Bundesamt* (www.destatis.de)
- Greece: *Ελληνική Στατιστική* Αρχή (www.statistics.gr)
- Ireland: Higher Education Authority (www.hea.ie)
- Italy: *Ufficio di Statistica - Ministero dell'Instruzione, dell'Università e della Ricerca* (statistica.miur.it)
- Latvia: *Izglītības un zinātnes ministrija* (www.izm.gov.lv ), *Centrālā statistikas pārvalde* (www.csb.gov.lv)
- Netherlands: *Centraal Bureau voor de Statistiek* (statline.cbs.nl)
- Spain: *Estadística de Estudiantes Universitarios. Sistema Integrado de Información Universitaria* (SIIU) *(www.educacion.gob.es/siiu)*
- Switzerland: *Bundesamt für Statistik* (www.bfs.admin.ch)
- UK: Higher Education Statistics Agency (www.hesa.ac.uk)

The data provided by these sources are public-domain except in the UK case, where HESA sells its reports. For Spain the data was not directly available online, a request form had to be sent to the Education Ministry to reach the data of interest.

For Romania, differently than all the other countries in this report, the data was collected by direct personal contact with all the Deans of Informatics Faculties in the country. With the exception of two institutions, all Faculties where Informatics studies are offered provided the data, comprising more than 80% of all students in the field in Romania[3].

For the list of institutions (Appendix A), several sources were consulted in each country, including references AT1-AT2, BE1-BE2, DK1-DK2, GE1-GE3, IT1, NE1-NE2, SW1-SW3, UK1-UK3, university websites and national contacts.

Like the 2014 and 2015 editions, this report includes numbers not only from traditional research Universities but also fr*om **"Universities of Applied Sciences" (UAS)**: Fachhochschulen* (Austria, Germany and Switzerland[4]), *Hautes Écoles*

[3] Simona Motogna, personal communication

[4] For discussions of institutions, programs and degrees in Switzerland, we rely on English terminology when in common use, or otherwise on German terminology. French and Italian versions of these terms are used in the corresponding regions.

(Belgium French community), *Hogescholen* (Belgium Flemish community, Netherlands), *Rakenduskõrgkoolid* (Estonia) *Professionshøjskolerne* (Denmark), Institutes of Technology (Ireland).

These institutions, known by different names in different countries (a common English translation is virtually impossible) have a common profile, they do offer profession (or vocation)-oriented higher education studies. In a few countries only at Bachelor level, but in most, studies at Bachelor and Master level. Excluding Ireland, where Institutes of Technology perform research and do offer PhD studies in Informatics, in all the other countries included in this report, UAS do not offer PhD studies and in general do not perform scientific research. In Estonia, most UAS are part of Research Universities and have common professors and teaching staff.

Omitting enrolled students and graduates from UAS would have an important downward effect on the reliability of this report since a significant proportion of Informatics students (e.g. the majority in Belgium, Netherlands and Switzerland, about half in Germany, Estonia, Ireland) study in such institutions. In addition, it would skew comparisons with the UK, where "polytechnics", formerly the equivalent of UAS, no longer exist as a separate category, having as a result of the Further and Higher Education Act 1992 been either turned into universities or incorporated into existing universities [UK4].

## 2.3 Data sources for salaries

For salaries (Section 8), reported at the level of PhD Candidate, Postdoctoral Researcher and several Professor ranks, the present report is based on data from Austria, Belgium, Estonia, France, Germany, Greece, Italy, Latvia, The Netherlands, Romania, Spain, Switzerland and the UK. In most of these countries information on the base gross salaries of academics is publicly available and reported by higher education and research ministries, academics associations, unions, or directly by the universities. The only two exceptions are Latvia and Estonia. In Latvia, the salary data was collected by directly interviewing representatives of a number of selected relevant institutions. In Estonia, the data was provided by all institutions offering Informatics higher education studies in the country. We report salaries for academic positions at traditional universities, salaries paid at UAS were not included in this report, except for Estonia where teaching positions and employment conditions are exactly the same in both kid of institutions.

## 2.4 A general warning

This report has chosen, as noted, precision and exactness over generality. We have limited ourselves to countries and parameters for which reliable official data was available[5]. We have high confidence in the quality of the results presented here, and ask the reader to be wary of hasty reactions if some results do not immediately seem believable. Even if you think *you* know the situation in your country inside out, and a particular figure does not "look right", please remember the following observations:

- Do not jump to conclusions after reading the results in a table without consulting the notes that follow it. This comment is particularly important for the salary tables of Section 8, since salary conditions vary considerably across countries.
- Student numbers comparisons must take into account the differing definitions of universities, in particular the notion of "University of Applied Sciences" as it exists in some of the countries surveyed.
- All numerical information comes from official governmental sources[6]. In some cases, colleagues told us that they had doubts about some of the resulting figures. Our view has been that, whatever their possible limitations, we were better off trusting government statistical offices than relying on private sources.

Genuine errors may of course have crept in, and we will be grateful to receive corrections.

[5] The two exceptions, clearly marked as such, are the rough extrapolations in Sections 5.4 and 6.4.
[6] Here too exceptions are marked clearly, for example with the mention "X, personal communication".

# 3 Names of subjects

Informatics is known under different names in different European languages and countries, and in English as well. Table 1 lists the subject names that were used to identify Informatics programs in the countries selected for the survey of institutions in Appendix A.

When a clear translation of foreign terms into English exists, it is given in parentheses. Not included are some programs with Informatics content taught in non-informatics curricula, for example in Electrical Engineering in universities where this discipline is separated from Informatics. Note that we used the term "Informatics" as a translation of *Informatik*, *Informatica*, *Informatique*, Informaatika, etc., although some departments in non-English speaking countries translate it as "Computer Science" in the English versions of their web sites. Note also that in many countries Master programs are offered and have English names.

| ***Table 1. Names of Informatics subjects*** | |
|---|---|
| **Austria** | *Angewandte Informatik* (Applied Informatics); Applied Image and Signal Processing; *Bioinformatik* (Bioinformatics); Computational Intelligence; *Informatik* (Informatics); *Medieninformatik* (Media Informatics); *Medizinische Informatik* (Medical Informatics); Pervasive Computing; Scientific Computing; Software & Information Engineering; Software Engineering & Internet Computing; *Technische Informatik* (Computer Engineering); Visual Computing; *Wirtschaftsinformatik* (Business Informatics) |
| **Belgium (Flanders and Wallonia)** | *Architecture des Systèmes Informatiques* (Computer System Architecture); *Bio-informatica* (Bionformatics); *Bioinformatique et Modélisation* (Bio-informatics and Modelling); *Cybersécurité* (Cybersecurity); Computer Science; Computer Science Engineering; Computer Science and Engineering; Computer Systems Architecture; *Computerwetenschappen* (Computer Science); *Computernetwerken en Gedistribueerde Systemen* (Computer Networks and Distributed Systems); Data Science; *Informatica* (Informatics); *Informatique* (Informatics); *Informatique de Gestion* (Business Informatics); *Informatique et systèmes* (Computer Systems); *Ingénieur Civil en Informatique* (Computer Science and Engineering); *Multimedia en Communicatietechnologie* (Multimedia and Communication Technology); *Sciences Informatiques* (Computer Science); Software Engineering; *Technologie de l'informatique* (Information Technology); *Toegepaste Informatica* (Applied Informatics); *Wiskundige Informatica* (Mathematical Informatics) |
| **Denmark** | Bioinformatics; Computer Science; Data Engineering; Digital Communication; Digital Innovation & Management; Digital Media and Design; Electronics and Computer Engineering; Embedded Software Systems; Games; Global Business Informatics; Human Centered Informatics; Informatics; Information and Communications Technology; Information Management; Information Technology; IT and Cognition; IT Management & Business; IT Network and Electronics Technology; IT Product Design; IT, Communication and New Media; Machine Intelligence; Media Technology and Games; Multimedia Design and Communication; Networks and Distributed Systems; Software Development and Technology; Software Development; Vision, Graphics and Interactive Systems; Web Development |
| **Estonia** | *Arvutigraafika* (Computer Graphics); *Arvutisüsteemid* (Computer and Systems Engineering); *Arvutitehnika* (Computer Engineering); *Arvutitehnika ja robootika* (Robotics and Computer Engineering); *Digitaalsed õpimängud* (Digital Learning Games); *E-riigi tehnoloogiad ja teenused* (E-Governance Technologies and Services); *Haridustehnoloogia* (Educational Technology); *Info- ja kommunikatsioonitehnoloogia* (Information and Communication Technology); *Informaatika* (Computer Science); *Informaatika* (Informatics); *Infosüsteemide analüüs* (Information System Analysis); *Infotehnoloogia* (Information Technology); *Infotehnoloogia süsteemid* (IT Systems); *Infotehnoloogiliste süsteemide arendus* (Information Technology Systems Development); *Infoühiskonna tehnoloogiad* (Information Society Technologies); *Inimese ja arvuti interaktsioon* (Human-Computer Interaction); *IT süsteemide administreerimine* (IT Systems Administration); *IT süsteemide arendus* (IT Systems Development); *Küberfüüsikaline süsteemitehnika* (Cyber-Physical Systems Engineering); *Küberkaitse* (Cybersecurity); *Küberturbe tehnoloogiad* (Cyber Security Engineering); *Programmeerimine* (Programming); *Rakendusinformaatika* (Applied Computer Science); *Rakendusinfotehnoloogia* (Applied Information Technology); *Tarkvaratehnika* (Software Engineering); *Tehnosuhtlus* (Technical Communication); *Äriinfotehnoloogia* (Business Information Technology) |

| | |
|---|---|
| **Germany** | *Bioinformatik* (Bionformatics); *Computer- und Kommunikationstechniken* (Computer and Communications Engineering); *Informatik* (Informatics); *Ingenieurinformatik/Technische Informatik/Informationstechnik* (Computer Engineering); *Medieninformatik* (Media Informatics); *Medizinische Informatik* (Medical Informatics); *Wirtschaftsinformatik* (Business Informatics or Information Systems) |
| **Greece** | *Πληροφορική και Τηλεπικοινωνίες* (Informatics and Telecommunications); *Μηχανική Πληροφορικής και Επικοινωνιακών Συστημάτων* (Information and Communication Systems Engineering); *Μηχανική Η/Υ, Τηλεπικοινωνιών και Δικτύων* (Computer and Communication Engineering); *Πληροφορική* (Informatics); *Ηλεκτρολόγων Μηχανικών και Τεχνολογίας Υπολογιστών* (Electrical and Computer Engineering); *Επιστήμη Υπολογιστών* (Computer Science); *Μηχανική Η/Υ και Πληροφορικής* (Computer Engineering and Informatics); *Ψηφικά Συστήματα* (Digital Systems); *Εφαρμοσμένη Πληροφορική* (Applied Informatics); *Πληροφορική και Τηλεματική* (Informatics and Telematics); *Επιστήμη και Τεχνολογία Υπολογιστών* (Computer Science and Technology); *Επιστήμη και Τεχνολογία Τηλεπικοινωνιών* (Telecommunications Science and Technology); *Πληροφορική με εφαρμογές στην βιοιατρική* (Computer Science and Biomedical Informatics); *Ηλεκτρονικών Μηχανικών και Μηχανικών Υπολογιστών* (Electronic and Computer Engineering) |
| **Ireland** | Applied Computing; Business and Information Technology; Business Information Systems; Computational Problem-Solving; Computational Thinking; Computer and Communications Engineering; Computer Applications; Computer Forensics & Security; Computer Games Development; Computer Networks and Systems Management; Computer Science and Business; Computer Science and Language; Computer Science, Mathematics and Philosophy; Computer Science; Computer Systems; Computer, Electronic and Communications Engineering; Computing - Games Design and Development; Computing in Multimedia Systems/Web Engineering; Computing with Cloud; Computing with French; Computing with Mobile App Development; Computing with Multimedia; Computing with Software Development; Electronic and Computer Engineering; Enterprise Computing; Green Information Technology; Information Systems Management; Information Technology; Interactive Applications Design and Development; Internet Systems Development; Management Science and Information Systems Studies; Multimedia Programming and Design; Software Design and Development; Software Development and Computer Networking; Software Development; Software Engineering; Web Development |
| **Italy** | *Bioinformatica* (Bioinformatics); *Comunicazione Digitale* (Digital Communication); *Comunicazione Multimediale* (Multimedia Communication); *Informatica* (Informatics); *Informatica Musicale* (Musical Informatics); *Informatica per le Discipline Umanistiche* (Informatics for Humanities); *Informatica per il Management* (Management Informatics); *Ingegneria dell'Informazione* (Information Engineering); *Ingegneria Informatica* (Informatics Engineering); *Scienze e Tecnologie dell'Informazione* (Information Science and Technology); *Sicurezza Informatica* (Informatics Security); *Tecniche e Metodi per la Società dell'Informazione* (Techniques *and* Methods for the Information Society) |
| **Latvia** | *Automātika un datortehnika* (Automation and Computing Machinery); *Biznesa informātika* (Business Informatics); *Datorzinātne* (Computer Science)*; Datorsistēmas* (Computer Systems); *Datorvadība un datorzinātne* (Computer Control and Computer Systems); *Elektronika* (Electronics); *E-studiju tehnoloģijas un pārvaldība* (E-Learning Technologies and Management); *Informācijas sistēmas* (Information Systems); *Informācijas sistēmu vadība* (Management of Information Systems); *Informācijas tehnoloģija* (Information Technology); *Intelektuālās robotizētās sistēmas* (Intelligent Robotised systems); *Mehatronika* (Mechatronics); *Programmēšana* (Programming); *Programmēšanas inženieris* (Programming Engineer); *Mikroelektronisko čipu datorvadīta projektēšana* (Computer-Aided Design of Microelectronical Chips); *Sociotehnisku sistēmu modelēšana* (Modelling of Socio-Technical Systems); *Telekomunikācijas* (Telecommunications); *Telemātika un loģistika* (Telematics and Logistics); *Transporta datorvadība; informācijas un elektroniskās sistēmas* (Computer Control of Transport, Information and Electronic Systems); *Transporta elektronika un telemātika* (Transport Electronics and Telematics) |
| **Netherlands** | *Bedrijfskundige Informatica* (Business IT & Management); *Bio-informatica* (Bioinformatics); Business Informatics; *Communicatiesystemen* (Communication Systems); Communication and Multimedia Design; Embedded Systems; Game and Media Technology; *Informatica* (Informatics); *Informatiekunde* (Information Science); Information Security; Kunstmatige Intelligentie (Artificial Intelligence); Software Engineering; *Technische Informatica* (Computer Science and Engineering) |
| **Romania** | *Calculatoare* (Computers); *Informatica* (Informatics); *Informatica Aplicata* (Applied Informatics); *Informatica Economica* (Business Informatics); *Tehnologia Informatiei* (Information Technology) |
| **Switzerland** | *Bioinformatik* (Bionformatics); *Computerlinguistik* (Computer Linguistics); *Geoinformatik* (Geoinformatics); *Informatik* (Informatics); *Ingenieurinformatik*/*Technische Informatik* (Computer |

| | |
|---|---|
| | Engineering); *Kommunikationssysteme* (Communication Systems); *Medieninformatik* (Media Informatics); *Neuroinformatik* (Neuroinformatics); *Rechnergestützte Wissenschaften* (Computational Science and Engineering); *Softwaresysteme* (Software Systems); *Wirtschaftsinformatik* (Business Informatics or Information Systems) |
| **Spain** | *Diseño y Desarrollo de Videojuegos* (Video Game Design and Development); *Ingeniería de Computadores* (Computer Engineering); *Ingeniería en Desarrollo de Contenidos Digitales* (Digital Content Development Engineering); *Ingeniería Informática* (Informatics Engineering); *Informática y Servicios* (Information Technology and Services); *Ingeniería del Software* (Software Engineering); *Matemática Computacional* (Computational Mathematics); *Matemática e Informática* (Mathematics and Informatics); *Multimedia; Sistemas de Información* (Information Systems); *Sistemas TIC* (IT Systems); *Tecnologías de la Información* (Information Technology) |
| **UK** | Advanced Computing; Advanced Computing (Machine Learning, Data Mining and High-Performance Computing); Advanced Computer Science; Advanced Computer Science and IT Management; Artificial Intelligence; Artificial Intelligence and Computer Science; Big Data; Cognitive Science; Computer Science; Computer Science (Human Computer Interaction); Computer Science and Electronics; Computer Science and Philosophy; Computer Science and Management Science; Computer Science and Physics; Computer Science with Artificial Intelligence; Computer Science with Business Management; Computer Science with Distributed Systems and Networks; Computer Science with Image and Multimedia Systems; Computer Science with Innovation; Computer Science with Management; Computer Science with Mobile and Secure Systems; Computer Systems Engineering; Computing; Computing and Mathematics; Computing Science; Data Science; Design Informatics; Electronic & Software Engineering; Distributed and Networked Systems; Informatics; Information Security; Information Systems; Information Technology; Internet of Things; Mathematics and Computer Science; Software Development; Software Engineering; Software and Systems Security; Software Engineering with Management; Web Science; Others in Computing Sciences |

For Switzerland, we present the subject names in German, universities in the French-speaking and the Italian-speaking parts of the country rely on equivalents in their respective languages.

For the UK, we provide a non-exhaustive list of undergraduate and graduate programs consulting the website of Informatics Europe member institutions from the UK and a few more universities. The actual practice is much more diverse, as universities use a variety of names, partly with eyes on marketing the subjects to prospective students[7].

It is clear from this table that the discipline has a branding problem in Europe. While tradition is an obstacle, converging on a single name would help convey the discipline's fundamental unity.

[7] Jane Hillston, personal communication.

# 4 Systems of Higher Education

In the United States, another major region with a modern, advanced, influential and prestigious network of universities[8], the system of higher education is well-understood. It is also homogeneous in the sense that most universities rely on a considerable collection of common rules, practices, conventions and assumptions, covering the definition of degrees, the modes of recruitment, the role of universities, the status of faculties and other essential ingredients of the structure of higher education. Most features of this system also apply to Canada.

Europe knows no such consistency. Universities as they exist in Europe today are the result of an evolution that is not only long and prestigious, going back to the eleventh and twelfth centuries (Bologna, Paris, Oxford, Salamanca and many others); Europe can lay claim to the invention not only of the notion of University but also of the modern research-oriented ("*Humboldtian*") University. This long and prestigious history has led to diversity, compounded even more in the twentieth century by the application, in the eastern part of the continent, of a Soviet-influenced model, where research occurs in part in academies of sciences rather than universities.

As in other spheres of social activity, this diversity and the richness of national traditions is part of Europe's strengths, but it also complicates analysis (as it complicates cooperation). This section provides some background on the specifics of education among the countries surveyed in the rest of the report.

The discussion makes frequent references to the "Bologna" process, a wide-ranging effort to harmonize European Union systems of higher education, started by a meeting of education ministers in Bologna in 1999 [EU2]. Most European countries (including non-EU members such as Switzerland) have adopted the Bologna standards or are still in the process of consolidating them.

## 4.1 Austria

Austrian degree programs are offered by traditional (research) Universities (*Universitäten)* and by Universities of Applied Sciences (*Fachhochschulen*). Their contents and objectives are defined by the universities and are subject to approval by the ministry of education. Universities can be public or private but in either case they have to be consistent with the ministry's requirements.

A diploma from the secondary school (=*Matura*) is required as general qualification for university admission. Traditional universities do not require any additional entrance exam in Informatics; Universities of Applied Sciences may apply their own requirements.

Higher education in Austria is organized according to the Bologna agreement in three levels (this is the case for traditional Universities and also for Universities of Applied Sciences):

- Bachelor program (three years)
- Master program (two years)
- PhD program (minimum three years)

Only traditional Universities have the authorization to award doctoral degrees. PhD Candidates (*Prädocs*) can be financed by the university. In this case, they are employed as *Universitätsassistent*. Or, they can be financed by grants, funds or industrial cooperation and be employed as *Forschungsassistent*/*Projektassistent*. There are also PhD Candidates who are not funded at all and who do not have any employment contract.

The same system applies for Postdoctoral Researchers (*postdocs*) who can be employed as *Universitätsassistent* or *Forschungsassistent*/*Projektassistent*, depending on their funding source.

[8] Other obvious examples of such networks exist in Australia, Japan and Singapore.

The academic year in Austria is divided into semesters (winter and summer semester) and starts in October. Degree programs may start in the winter semester only (= October), or they can start both in winter and summer semester (= March).

Higher education in Informatics is usually provided at faculties of Informatics, faculties of sciences, faculties of engineering, and to a smaller extent at other areas.

At bachelor & master level there are numerous degree programs with different names.

Depending on the degree program the following degrees are awarded:

At the bachelor level:

- Bachelor of Science

At master level:

- *Diplom-Ingenieur*/*Diplom-Ingenieurin* (*Dipl.-Ing* / DI), comparable with Master of Science
- Master of Science

The course load for a bachelor program is 180 ECTS in total, for a master program 120 ECTS, and for a PhD program 180 ECTS. For all three degree programs a final thesis has to be submitted.

To the best of our knowledge internships within a company are not required, although a lot of computer science students work in the field of Informatics either during their holidays or they work part-time during the year.

## 4.2 Belgium

In Belgium, the higher education system is not unified across the independent communities (Flemish, French and German-speaking communities) that have their own competencies, including their own legislation on education. Each community thus has its own Ministry of Education, even though some educational matters remain the responsibility of the federal government. Below we describe the higher education system in the two main communities Flanders (Flemish) and Wallonia (French).

Higher education in both the Flemish and French communities is organized according to the Bologna agreement in three main cycles:

- Bachelor program (1st cycle, typically three years)
- Master program (2nd cycle, typically two years)
- PhD program (3rd cycle, minimum three years)

Bachelor and Master programs are offered by Universities (*Universiteit* in the Flemish community*, Université* in the French community) and University Colleges (*Hogescholen* in the Flemish community*, Hautes Écoles* in the French community). Universities focus on research and teaching and offer also post-graduate programs including PhD, which are not offered by University Colleges. University Colleges focus more on professional training and offer professional bachelor (in a few cases academic bachelor also) and master programs. In addition, specialized architecture and arts schools (*Écoles Supérieures des Arts*) also exist. Universities and University Colleges cooperate intensively forming the so called "*Associatie*" in the Flemish area and "*Pôles Académiques*" in the French area. These associations are formed by one university and at least one university college. Most Bachelor Programs are offered in the language of the region, although a few internationally oriented programs are offered (fully or partially) in English. Master Programs are offered in Dutch, French or English.

Bachelor's programs can have a professional or an academic orientation. Both require a study program of at least 180 ECTS credits and take minimum three academic years to be completed. The difference lies in the general goal of the degrees: professional bachelor's (e.g. office management, education, commerce, agriculture, health and

rehabilitation, social work, applied informatics, applied arts or the media) are more practice-oriented and focus on the competences necessary for certain professions, whereas academic bachelors are aimed at providing the learner with theoretic knowledge for further studies at a master's level. Academic bachelor programs are offered mainly by Universities and a few University Colleges while professional bachelor programs are offered exclusively by University Colleges. Some University Colleges also offer profession-oriented specialisation programs for holders of a Professional Bachelor Degree. These advanced bachelor programs comply at least 60 ECTS credits.

Master Programs are characterized by the integration of education and research and a master's dissertation. They mostly consist of 120 ECTS credits, sometimes 60, depending on the field of study, and therefore typically take two (sometimes one) academic years to complete. These programs aim to bring the student to an advanced level of knowledge and competences in a specific field of study. There are also a few profession-oriented master programs offered in University Colleges that do not focus on research.

Post-initial degrees exist at bachelor and master level. Advanced bachelor's programs are professional post-initial courses for specialisation. Prerequisite is a bachelor's degree. Advanced master's programs are academic further studies in which students can enroll after obtaining a master's degree. They aim to deepen the knowledge and/or competences in the specific field of study. Both advanced programs require at least 60 ECTS credits and mostly take one academic year to complete.

PhD programs (also called "doctoral programs") lead to the degree of doctor, after successful completion of independent scientific research and defense of a doctoral thesis. Enrollment at doctoral programs degrees is based on several conditions, among which holding a master's degree. The degree of doctor is only awarded by Universities.

For Bachelor Programs (both professional and academic) the general admission requirement is a secondary school-leaving certificate, the "d*iploma van secundair onderwijs"* in the Flemish region or the "*certificat d'enseignement secondaire supérieur*" in the French region. Compatible certificates from foreign countries, when officially recognized on the basis of a community decree, a Belgian law, a European directive or an international convention, also grant access to Bachelor programs. Admission may also be granted to foreign students, after individual assessment of their secondary education diploma.

Academic bachelor degrees give direct access to master programs. Some master degrees will give access to advanced master programs (at least another 60 ECTS credits), in some cases after a preliminary examination. In the Flemish region, professional bachelor degrees may give access to some master programs after a bridging program. The program and study workload will be determined by the institution board, with due consideration for individual skills, working experience, qualifications and competences of the student after an evaluation interview. Foreign higher education degrees give access to master programs (including advanced master programs) if the higher education institution boards consider the foreign higher education degree equivalent to the Flemish/French community degree.

Doctoral Programs are open to graduates with a relevant master degree, in some cases after a preliminary examination (depending on the study field). Foreign higher education degrees give access to doctoral programs if the university board considers the foreign higher education degree equivalent to a Flemish/French community master degree. The admission may still depend on a preliminary examination.

With the exception of a few small colleges, all universities and university colleges in Belgium are publicly funded. In Flanders, colleges receive subsidies based on their teaching activities (including the number of students) and universities receive subsidies based on their teaching activities and research output. In the French-speaking community, funding is based on the number of students but the total budget allocated to universities and colleges is fixed, irrespective of the number of students.

## 4.3 Denmark

Danish higher education institutions (HEIs) use the European Credit Transfer System (ECTS) for measuring study activities. 60 ECTS correspond to one year of full time study. Public HEIs are regulated by national legislation concerning degree structures, teacher qualifications and examinations. All programs are accredited by national, independent accreditation agencies and the Accreditation Council.

There are four types of institutions offering higher education programs, each with well-defined profiles:

- Academies of Professional Higher Education (*Erhvervsakademi*) offering professionally oriented first cycle degree programs.
- University Colleges (*Professionshøjskole*) offering professionally oriented first cycle degree programs.
- Research Universities (*Universitet*) offering first, second and third cycle degree programs in all academic disciplines.
- University level institutions offering first, second and third cycle degree programs in subject fields such as architecture, design, music and fine and performing arts.

Most of the HEIs are regulated by the Ministry of Science, Innovation and Higher Education. The Ministry of Culture regulates a small number of HEIs offering first, second and third cycle degree programs in fine and performing arts.

**Degrees**

The Academy Profession degree is awarded after 90-150 ECTS and includes a period of work placement of at least 15 ECTS. The programs are development-based and combine theoretical studies with a practical approach. The Danish title is “field of study” followed by the abbreviation AK and the English title is AP Graduate in “field of study”.

The Professional Bachelor’s degree is awarded after 180-240 ECTS and includes a period of work placement of at least 30 ECTS. The programs are applied programs. They are development-based and combine theoretical studies with a practical approach. The Danish title is *Professionsbachelor i* [field of study] and the English title is Bachelor of [field of study].

The Bachelor’s degree from a University is awarded after 180 ECTS. The programs are research-based and are offered in all scientific fields. The Danish title is *Bachelor* (*BSc*) *i* [field of study] and the English title is Bachelor (BSc) of Science in [field of study].

The Master’s degree is awarded after 120 ECTS. The programs are research-based and are offered in all scientific fields. The Danish title is abbreviated to *Cand.*[latin abbreviation of academic area] *i* [field of study]. The English title is *Master of Science* (*MSc*) in [field of study].

The PhD degree is awarded after 180 ECTS. PhD programs are offered by the Universities and some university level institutions offering degrees in the artistic and cultural field.

**Admission and progression**

General access to higher education in Denmark requires an Upper Secondary School Leaving Certificate or comparable qualifications. Admission to some particular programs requires entrance examination or submission of a portfolio of artistic work.

Completion of a short-cycle degree qualifies students for admission to a first cycle program. Holders of an Academy Profession degree can obtain a Professional Bachelor’s degree within the same field of study through a top-up program. Completion of a first cycle degree qualifies students for admission to the second cycle.

The 7-point grading scale is used in all state-regulated education programs as of September 2007 is the 7-point grading scale. Apart from the 7-point grading scale, pass/fail assessment may also be used. 2 is the minimum grade for passing an exam.

## 4.4 Estonia

Degree programs in Estonia are offered by traditional (research) Universities (*Ülikoolid*) and Universities of Applied Sciences (*Rakenduskõrgkoolid*). Universities can be public or private, in either case they have to meet the requirements of the Ministry of Education and Research.

The higher education system is organised according to the Bologna agreement on three levels:

- Bachelor's programs (three years)
- Master's programs (two years)
- PhD programs (three to four years)

Any student with a secondary-level education certification can apply to a university. Universities may require entrance exams, tests, and interviews. Most of the bachelor-level ICT programs are provided in Estonian. Estonia provides master and PhD students a rather broad range of internationally recognised English-based degree programs. Since the 2012/2013 academic year, higher education is free of charge in Estonia for those studying full time and in Estonian. However, there is a wide range of opportunities to study free of charge also in English, especially in ICT faculties.

Bachelor studies are the first level of higher education. The nominal length of studies is generally three years with 180 ECTS credits, and in a few disciplines it is up to four years with 240 ECTS credits. Graduates who have completed their studies are awarded a bachelor's degree. The ICT bachelor's programs include a final thesis, which is usually 8–10 ECTS.

The admission requirements to master's programs include the bachelor's degree or an equivalent level of qualification. The nominal length of studies is one to two years with 60 to 120 ECTS credits, but combined with the first cycle at least five years and 300 ECTS credits. The ICT master's programs include a thesis that must be prepared during the studies, usually during the second year and in parallel with courses.

Only research universities are authorised to award doctoral degrees. Although the universities of applied science are allowed to award master's degrees, currently all of the ICT master's programs are offered by traditional (research) universities.

Public and private higher education institutions are regulated by national legislation concerning degree structures and teacher qualifications. All programs have to be accredited by a national, independent accreditation agency: *Eesti Kõrghariduse Kvaliteediagentuur* (Estonian Higher Education Quality Agency). This agency is responsible for conducting institutional accreditation of higher education institutions and quality assessment of study program groups. Within the assessment process for study program groups, it is assessed whether the programs correspond with the current legislation and the national and international standards, including the quality of theoretical and practical training, the qualifications of the teaching and research staff, as well as the availability of the necessary resources.

Professional programs include a mandatory practical internship corresponding to 15% of the total ECTS of a particular program. A practical internship is also required in bachelor and master's programs, but the amount of time is defined by the specific program. The typical duration of the internship is 1–2 months, and the typical number of credits varies from 3–12 ECTS.

Admission requirements to PhD programs include the master's degree or an equivalent level of qualification. It is not possible to apply to PhD studies having only a bachelor's degree. In the 2016/2017 academic year, the principles for admission to PhD studies in the ICT faculties will change. Admission to PhD studies will take place by means of a competition, which is based on PhD thesis topics approved by the university.

A doctoral degree is granted after completion of the respective doctoral curriculum and doctoral thesis defence. Additionally, it is necessary to publish in leading international peer-reviewed scientific journals. The dissertation

defence is usually public. The expected size of the defence committee is at least 5–6 members. The requirements for the defence committee differ by university. The main rules specify that at least one members of the committee should come from outside Estonia, the defence committee shall include members with a doctoral degree or an equivalent qualification.

## 4.5 France

Even though France only figures in the Positions and Salaries part of this report (Sections 7 and 8), it is useful to describe briefly some peculiarities of the French system of higher education, particularly as they pertain to Informatics.

Outsiders to the French system often miss its most distinctive characteristic and, when they discover it, find it baffling. That French exclusive is the coexistence between two components:

- Universities, as known in the rest of the world (and pioneered by France with the Sorbonne, the original University of Paris, from about 1150 on).
- *Grandes Écoles* (literally: great schools), some of them known more specifically as *Écoles d'Ingénieurs* (engineering schools).

The *Grandes Écoles* distinguish themselves from Universities through the following traits:

- They are ranked in the public mind according to a non-official but well-understood hierarchy.
- Those at the top of that hierarchy, particularly *École Polytechnique* and *École Normale Supérieure* (the Paris branch) are extremely prestigious, and better considered than universities. Polytechnique has been, since Napoleon used it to ensure that artillery would have competent engineers, the golden path to technocratic and administrative careers (complemented, for administration, by the *École Nationale d'Administration*). *Normale Supérieure* is the most prestigious path to research careers particularly in mathematics, physics and the humanities. Just behind them in the ranking and also very prestigious are *École Centrale*, *École des Mines*, *École des Ponts et Chaussées*, *École Nationale Supérieure des Télécommunications* and a few others.
- Part of the source of the prestige is the competitive nature of entrance to these schools. They only provide a set number of places every year, awarded on the basis of competitive examinations, some specific to a given school, some shared. In contrast, admission to universities (outside of specific subjects such as law and medicine) is not subject to a *numerus clausus* but dependent only on a high-school degree (*baccalauréat*), awarded to about 80% of an age group [FR1].
- For most of these schools, preparation to the competitive examination takes place not in universities but in two-year special programs (*classes préparatoires*, preparatory curriculum) physically held in high-schools (*lycées*). These programs are extremely intensive, because of the specter of the competitions, in an atmosphere that is significantly different from universities.
- For those admitted after these two years (or three, since the second preparatory year may usually be repeated once in case of initial failure at the competitive exam), the program in the Grande École itself is generally two years, sometimes three.
- The focus of the preparatory programs and the *Grandes Écoles* is on teaching rather than research. This observation applies less to those at the top hierarchy; Polytechnique, for example, has numerous research laboratories of excellent standing, and *École Normale* is one of the high places of French research. But in the *Grandes Écoles* system at large the students get less exposed to research than they would in a Humboldt-style research university.
- Administratively, while universities are under the control of the ministry of education, some *Grandes Écoles* report to and get their financing from other departments. Polytechnique, for example, traditionally enjoys good funding though being formally a military school, managed by the department of defense.

The two systems, universities and *Grandes Écoles*, are not entirely disjoint, and efforts have taken place over recent years to establish bridges and build consortia. As an example of a bridge, paths exist for the best university students to transfer to a *Grande École* outside of the usual competition system; the other way around, many *Grandes Écoles* students take advanced degrees in universities, or pursue research there. As an example of a consortium, created in particular to achieve a scaling-up effect with a view to better positioning in international rankings, the new Paris-Saclay university brings together over 20 institutions including Paris-Sud University and the Polytechnique, Centrale and HEC Grandes Écoles. The fundamental division remains, however, and the differences of prestige remain firmly anchored in the French mindset. (The French equivalent of the popular saying "*This is not rocket science*" is "*This does not require a degree from Polytechnique*".)

While universities in general have not encountered undue difficulties in moving to the Bologna system, the Grandes Écoles are having a harder time. The problem is in part the existence of the two-year preparatory system, which does not give students any degree (they are supposed to get into some *Grande École*, and those who fail can usually transfer to the third year of a University), and would be too short for a bachelor's anyway. *Grande École* degrees are usually positioned as equivalent to a master's.

The planned inclusion of French student and degree data in future editions of this report will have to take into account these important peculiarities of the French system of higher education, which are particularly relevant to education in Informatics.

## 4.6 Germany

Education in Germany is governed and organised by the states (*Länder*), not by the federal government. Therefore, one has to deal with 16 state university laws that in some respect show slight differences. Nevertheless, the 16 states agree on the general structural properties of higher education. The standing conference of Ministers of Education (*Kultusministerkonferenz*, *KMK*) releases common regulations that the states are expected to observe.

Higher education in Germany differentiates three types of institutions: Universities (*Universitäten*), Universities of Applied Sciences (*Fachhochschulen*) and Universities of Cooperative Education (*Duale Hochschulen*).

Universities are the traditional institutions of higher education. They are research oriented and offer Bachelor, Master, and PhD degrees. The Universities' bachelor Informatics programs provide the scientific and methodological foundations of the discipline. Master programs are research oriented involving students in the current research activities of the Universities and allow a smooth transition to PhD programs. Qualification for professors is a PhD and the Habilitation or equivalent achievements.

*Fachhochschulen* are the successors of the previous engineering schools. They have in general a limited scope of topics (mostly engineering and business administration). Education at *Fachhochschulen* is more application oriented providing knowledge and skills directly needed by the job market. Despite the different profile academic degrees from University and *Fachhochschule* are formally equivalent which means that graduates from *Fachhochschule* may continue a master program at a University and vice versa. Qualification for a professor at *Fachhochschule* is a PhD and five years of practical work experience.

*Duale Hochschule* is the new name for what was previously called a *Berufsakademie* (vocational academy). In some states the *Duale Hochschulen* are recognized as academic institutions. They offer Bachelor degrees in cooperation with companies. The education is organised as phases where students work at their company interleaving with phases in classes at the University. The students finish with a bachelor's degree, which also formally entitles them to continue with a master program at *Fachhochschule* or University, if the institution is officially recognized as academic. Students are from the very beginning employees of the company and earn some money. Qualification for a professor at *Duale Hochschule* is an academic degree and five years of practical work experience.

Students in Informatics are enrolled in roughly equal numbers in University and *Fachhochschule*. In terms of student numbers, *Duale Hochschule* does not play a major role. For the remainder of this document, we refer to Universities only, since they represent the members of Informatics Europe in Germany.

The structure of an Informatics program is usually a 3-year Bachelor (180 ECTS) and a 2-year master (120 ECTS). Bachelor programs may be up to four years, but in this case the corresponding consecutive master program has to be only one year, since the complete bachelor-master-cycle has to be five years corresponding to 300 ECTS. Basic entrance requirement for bachelor programs is the school leaving certificate ("*Hochschulreifezeugnis*"). In recent years, some state University laws also allow students who have finished a vocational training. This type of permeability between academic and vocational education has high priority at the political agenda, despite problems of qualification mismatch.

The German constitution ensures free choice of profession which includes the right to enter higher education programs. A German University can limit the access only if there are more applicants than places. Otherwise, any applicant fulfilling the formal requirements hat to be accepted. There are laws regulating the calculation of places based on the number of teaching personnel and the respective curriculum (*Kapazitätsrecht*). Some universities limit the number of places (*numerus clausus*), some don't. If a limitation is in place a ranking has to be calculated based on grades and some other criteria to select the admitted applicants. Students are expected to earn 30 credits per semester. Depending on the state's University law, some universities set an upper bound for the individual study duration or a lower bound for the study progress (ECTS/semester) but in general there is only little pressure to finish in time.

The programs are organized in modules which consist of one or more courses and are finished by one exam. The size of a module is usually between 5 and 12 ECTS. Each program requires submitting a thesis at the last semester. A Bachelor thesis is worth 12 ECTS, a Master thesis 30 ECTS.

The academic year consists of two semesters and starts at October 1st with the winter semester. The summer semester starts on April 1st. Classes in the winter semester usually begin Oct. 15 and end Feb 15, classes in the summer semester run from April 15 to July 15. Directly after the lectures are finished, there is 2- or 3-week examination period.

The prevailing bachelor program is called "*Informatik*" (Informatics, Computer Science), but there is also "*Technische Informatik*" (Computer Engineering) offered. Also common are blended programs like Business Informatics, Bioinformatics, or Media Informatics. At the master's level there is even more specialization available, e.g. programs like e.g. Embedded Systems, Computer Security or Computational Neuroscience.

The academic degree of the first cycle is "Bachelor of Science" (B.Sc.), at the second cycle "Master of Science" (M.Sc.). At the doctoral level you get either a *Dr.-Ing.* (Doctor in Engineering) or a *Dr.rer.nat.* (Doctor of Natural Sciences). This depends on the doctoral regulations of the respective faculty. The usual way to obtain a PhD in Informatics is to apply for a position as a research assistant at a University. This is a full-time position typically for up to 5-6 years that has some teaching obligation (4 weekly hours) but leaves sufficient time to work on a PhD thesis.

## 4.7 Greece

Higher education in Greece is public and provided by HEIs, which are Legal Entities under Public Law. HEIs are subject to state supervision which is carried out by the Minister of Education and Religious Affairs and are financed by the government.

According to the Framework Law (2007), higher education consists of two parallel sectors: the University sector (Universities, Polytechnics, Fine Arts Schools, the Open University) and the Technological sector (Technological Education Institutions (TEI) and the School of Pedagogic and Technological Education). The same law regulates issues concerning governance of higher education along the general lines of increased participation, greater transparency, accountability and increased autonomy.

Studies leading to a first cycle degree in Greek Universities last at least four years for most scientific sectors while they last five years at Polytechnics, other applied sciences and certain Art Departments and six years for Medical School. Each academic year comprises two semesters and every semester includes thirteen weeks of teaching. Obtaining a University diploma/certificate requires the attendance of a study program which includes courses corresponding to a minimum of 60 ECTS credits per academic year.

Entrance to the various Schools of the Universities (*Panepistimio*) and Technological Education Institutions (*Technologiko Ekpaideftiko Idryma* - TEI) depends on the general score obtained by Lyceum graduates, on the results of state examinations, on the number of available places and on the candidates' ranked preferences among schools and sections.

Students who successfully complete their studies in Universities and TEIs are awarded a first cycle degree, which is called *Ptychio*. Recent legislation on quality assurance in Higher Education, the Credit Transfer System and the Diploma Supplement defines the framework and criteria for evaluation of university departments and for certification of student degrees. These measures aim at promoting student mobility and contributing to the creation of a European Higher Education Area.

*Ptychio* leads to employment or further study at the post-graduate level that includes the second cycle leading to the second degree, which is called *Metaptychiako Diploma Eidikefsis* - equivalent to a Master's degree - and the third cycle leading to the doctorate degree, which is called *Didaktoriko Diploma*. A program leading to a Master's degree includes courses corresponding to a minimum of 60 ECTS credits. A doctorate study program includes courses corresponding to at least 30 ECTS credits, as well as a dissertation preparation with a public defense which must be approved by a seven-member committee of experts. Some of the committee members can be affiliated with foreign universities.

## 4.8 Ireland

In Ireland, the Bologna style degree has not been implemented, but the ECTS is used to define courses load. Presently degrees are typically four years long. Some universities offer three-year degree but this are normally class as ordinary level degrees and are less common for computer science and technical degrees.

Public HEIs are regulated by national legislation. There are two types of institutions offering higher education programs, Universities and Institutes of Technologies. The Universities are governed by the Universities Act. Their role is explicit to "to advance knowledge through teaching, scholarly research and scientific investigation". Institutes of Technology (IOT) are governed by Institutes of Technologies Act. Their principal function is "to provide vocational and technical education and training for the economic, technological, scientific, commercial, industrial, social and cultural development". IOT do engage in research and many are also PhD granting institutions, differently than the Universities of Applied Sciences in the other countries included in this report, to which IOT have comparable profile.

Students who wish to enter a University or an IOT must normally hold a secondary school degree. In order to obtain a place on a particular course, candidates must obtain sufficient 'points' on the senior cert examinations. The 'points' for a various course vary based on demand and number of places. There is also a constraint for most Informatics degrees in universities on the grade obtained in secondary school mathematics. There are some small caveats: if a student fails to obtain the requisite grade in mathematics, special university run entrance exams are sometime provided.

There is also an alternative route (known as the access program) for students from non-typical educational backgrounds, who can, based on an application and interview process, enter into a one-year preparation course; if requisite scores are obtained, they can progress to first year of the degree.

A bachelor's program typically includes a final year project and report performed over seven months (taken in parallel with coursework). A practical internship in a company during the studies is required (typical duration: 5-9 months, depending on the University).

There are examinations and continuous assessment every year. If a student fails to pass the examinations and assessment, they may repeat examinations in the autumn. Failure to pass the examinations as a whole in autumn warrant repeating the year (or component thereof). The rules for compensation vary across universities.

If a student fails to complete examinations for a particular year in a requisite time (normally four attempts in two years), they may have to leave the course. Permission to try to pass the examinations again is usually at the discretion of the Department or Faculty.

A master's research program includes a thesis, performed over 18-24 months. A taught master's program usually has course work for 60 ECTS and then a mini-thesis worth 30 ECTS. There are some exceptions to the above. Students are not expected to have a practical internship in a company during the master studies

Progress in taught masters is evaluated every year, either through continuous control or through end-of-year exam), with possibility of being expelled from the program if failing. For masters by research evaluation is done at the end of the master's program.

Normally, to start a PhD, candidates must hold a first class or second class *honours* bachelor degree in computer science or related discipline. Candidates may be accepted under circumstances, e.g., a primary degree and sufficient relevant experience. A candidate will also be accepted with a Master's degree in a relevant discipline.

A PhD leads to a dissertation which is subject to a private defense currently restricted to the external examiner(s), internal examiner(s), supervisor and usually Professor of the discipline (or nominee) as chair. Publications are not formal requirement to conclude a PhD, but the candidate is expected to publish papers in well ranked peer reviewed conferences and/or paper in well ranked journal.

## 4.9 Italy

Higher education in Italy is organized according to the Bologna agreement in two levels: a Bachelor degree level (called *Laurea* or *Laurea Triennale*) and a Master degree level (called *Laurea Magistrale*). Degree programs are defined by the Ministry at a very high level in terms of teaching goals and required disciplines. Each University can then specialize this general framework, subject to approval by the Ministry itself. Universities can be public or private, but in either case they have to conform to Ministry regulations in terms of degree programs and their requirements. A University can provide just a few or many degrees. The standard name is "*Università*", but some universities are called "*Politecnico*" (Polytechnic) simply because for historical reasons they have focused on teaching and researching in technical areas. Medical schools are usually part of Universities. There is no classification in "Research" Universities and "Applied Sciences" Universities: therefore, any University is able to offer doctoral programs as well as professionally oriented degrees. Most universities are public, and private universities have to follow the same requirements set forth by the Ministry.

Higher education in Informatics is provided in the classes of degrees in Sciences and in the classes of degrees in Engineering, and to a smaller extent in other areas.

At the bachelor level there are the following degree programs:

- *Laurea* in *Scienze dell'Informazione* (L-31), in the area of Science.
- *Laurea* in *Ingegneria dell'Informazione* (L-8), in the area of Engineering

At the master level there are the following degree programs:

- *Laurea Magistrale* in *Informatica* (LM-18), in the area of Science
- *Laurea Magistrale* in *Ingegneria Informatica* (LM-32), in the area of Engineering
- *Laurea Magistrale* in *Metodologie Informatiche per le Discipline Umanistiche* (LM-43), in the area of Humanities
- *Laurea Magistrale* in *Tecniche e Metodi per la Società dell'Informazione* (LM-91), also in the area of Humanities
- *Laurea Magistrale* in *Sicurezza Informatica* (LM-66), in the area of Science

Any student with a secondary level degree (called *Maturità*) can enter a University, but for areas regulated by the European Union (e.g., Medicine, Architecture, ...) there is an entrance exam to comply with the *numerus clausus* requirement. Some universities or degrees may have an entrance evaluation, which is not selective, but may impose some additional teaching duties to students below a given threshold. This may happen for Informatics degrees.

Teaching is usually organized in semesters of about 13 weeks each, typically October-January and March-June. Course load is always measured in ECTS. For Informatics degrees, it's typical to use courses of 6 credits (one semester course) or 12 credits (two semester course).

Company internship is foreseen by the national regulation only at the bachelor level. It is not required, but if performed credits are assigned to students, up to a maximum of 15 credits. Internship can be done in every period, but is usually done during the last year.

Both for bachelor and master there is some kind of final work to be done. It is typically 6 credits for the bachelor and 30 for the master. While for the master it is explicitly envisaged the production of a written thesis, for bachelor each University can freely decide the format of such a work.

## 4.10 Latvia

Higher education in Latvia is organized according to the Bologna agreement in four levels: a short-cycle program (called *Pirmā līmeņa profesionālā augstākā izglītība*), a Bachelor degree level (called *Bakalaurs*), a Master degree level (called *Maģistrs*), and a Doctor degree level (called *Doktors*). Degree programs are defined by the Ministry of Education and Science at a very high level in terms of teaching goals and required disciplines. Each HEI can then specialize this general framework, subject to approval by the Ministry. Universities can be public or private, but in either case they have to conform to Ministry regulations in terms of degree programs and their requirements.

Both public and private HEIs are regulated by national legislation concerning degree structures, teacher qualifications and examinations. All programs are accredited by national, independent accreditation agencies and the Accreditation Council.

There are four types of institutions offering higher education in Latvia, each with well-defined profiles: *koledža*, *augstskola*, *akadēmija*, *universitāte*.

*Koledža* (College) offers professionally oriented short-cycle programs (2-3 years, including internship with at least 24 ETCS). Colleges award diploma of first level professional higher education and fourth level (highest being fifth level) professional qualification.

*Augstskola* (sometimes called University of Applied Sciences) offers first, second and third (not always) cycle degree programs, offers academic and professional study programs, performs research and development, and artistic creation. In *Augstskola* 40% of elected teachers must have a doctoral degree.

*Akadēmija* (Academy) offers first, second and third (not always) cycle degree programs. It offers academic and professional study programs, performs research and development, and artistic creation. In *Akadēmija* at least 50% of elected teachers must have a doctoral degree.

*Universitāte* (University) is a HEI meeting the following criteria:

1. to offer bachelor, master, and doctor programs (defense of doctoral works in every doctoral program takes place annually);
2. at least 65 % of elected teachers must have a doctoral degree;
3. to publish scientific periodical journals in the fields of the HEI study programs;
4. to have structural units or scientific institutions in the main scientific directions where research is performed.

Most of the HEIs are regulated by the Ministry of Education and Science. The Ministry of Culture regulates a small number of HEIs offering first, second and third cycle degree programs in fine and performing arts. There are some HEI regulated by other ministries (Ministry of Agriculture, Ministry of Health, Ministry of Defense).

Any student with a secondary level diploma can attend an HEI. In the majority of the cases, as in Informatics, marks from a centralized final examination at secondary school are taken to decide the results of the competition. Teaching is usually organized in semesters of about 20 weeks each, around September-January and February-June. Course load is always given in Latvian credits (1 Latvian credit equals 1.5 ECTS).

Professional programs include mandatory company internship corresponding to 24-39 ECTS, academic programs may include internship.

Both for bachelor and master there is some kind of final work to be done. It is typically 15 credits for bachelor and 30 credits for master. It is explicitly envisaged the production of a written thesis.

**Degrees**

The first level Professional Higher Education Diploma is awarded after 120-180 ECTS and includes a period of work placement of at least 24 ECTS. The programs are development-based and combine theoretical studies with a practical approach.

The Professional Bachelor's degree is awarded after 240 ECTS and includes a period of work placement of at least 39 ECTS. The programs are applied development-based programs and combine theoretical studies with a practical approach.

The Bachelor's degree is awarded after 180-240 ECTS. The programs are more research-based and are offered in all scientific fields.

The [Professional] Master's degree is awarded after 60-120 ECTS (together with first cycle degree it must make at least 300 ECTS). The programs are more research-based and are offered in all scientific fields.

The PhD degree is awarded after 180 ECTS. PhD programs are offered by the Universities and some university level institutions offering degrees in the artistic and cultural field.

**Admission and progression**

General access to higher education in Latvia requires an Upper Secondary School Leaving Certificate or comparable qualifications. Admission to some particular programs requires entrance examination or submission of a portfolio of artistic work.

Completion of a short-cycle degree qualifies students for admission to a first cycle program, usually in the second or third year. Completion of a first cycle degree qualifies students for admission to the second cycle.

The 10-point grading scale is used in all state-regulated education programs. Apart from the 10-point grading scale, pass/fail assessment may also be used. 4 is the minimum grade for passing an exam.

## 4.11 The Netherlands

Higher education in The Netherlands is organized at two levels:

- scientific education (W*etenschappelijk Onderwijs*, WO) – at Universities (*Universiteiten*)
- higher vocational education (*Hoger Beroepsonderwijs*, HBO) – at Universities of Applied Sciences (*Hogescholen*)

The Bachelor-Master system is used in Dutch higher education. Course loads are expressed in terms of the ECTS.

**Informatics at Universities**

Bachelor's programs at Universities span three years (180 ECTS). There are two Informatics programs:

- Informatics (*Informatica*), at Universities
- Technical Informatics (*Technische Informatica*), at Universities of Technology

This division has a historical background. In practice the differences between these programs is very small.

For admission, a diploma of pre-university education (VWO) is necessary. There are additional requirements regarding the presence of an elective mathematics subject in the student's secondary school exam.

Dutch universities offer several related bachelor's programs, including Information Science and Artificial Intelligence, with slightly different admission requirements.

A bachelor's program contains a thesis (typically 9—15 ECTS), often written in parallel with courses. A practical internship is usually not required.

Dutch universities offer a variety of master's programs in Informatics and Informatics-related areas, including programs such as: Artificial Intelligence, Bioinformatics, Business Information Systems, Computing Science, Embedded Systems, Game and Media Technology, Human Media Interaction, Parallel and Distributed Computer Systems, and Telematics.

Master's programs are typically research-oriented and two years in duration (120 ECTS). In the second year a substantial MSc project is carried out, completed by a MSc thesis. Some one-year master programs exist (60 ECTS), in applied areas. MSc projects are carried out internally, in a research group at the university, or externally, on selected projects in companies.

For admission, a University bachelor degree (Informatics or Technical Informatics) is necessary. Additional requirements apply for admission with a related bachelor degree, or for admission to specific tracks within a master's program.

Students with a vocational bachelor's degree in an informatics-related discipline are usually required to complete an additional pre-master program in order to be admitted to a University master.

PhD Candidates in The Netherlands are not regarded as students, but are normally employed by the university as "*promovendus*" (PhD Researcher) with mainly research tasks and some teaching duties. For admission to the PhD examination, a Master's degree (or equivalent) is required. After their manuscript is approved by their PhD supervisor, PhD Candidates submit a thesis, which is examined by a reading committee, typically consisting of 4-5 qualified members. After approval there is a public defense in front of a bigger committee including the reading committee.

**Informatics at Universities of Applied Sciences**

Education at this level concerns mostly bachelor's programs. There are only a few 'professional master's' programs. Awarding PhDs is restricted to Universities.

Vocational bachelor's programs span four years (240 ECTS). They include: Informatics, Technical Informatics, business it & management, communication & multimedia design.

For admission, a diploma of senior general secondary education (HAVO) is necessary. For Technical Informatics, a specific elective mathematics subject is required to be part of the student's exam.

Vocational bachelor's programs are practice oriented. The programs contain an internship (usually about 30 ECTS, including a thesis or internship report).

## 4.12 Romania

Higher education in Romania is offered by research universities that are divided into two categories: traditional universities and technical universities. Degree programs are defined by faculties and must be approved by the Romanian Agency for Quality Assurance in Higher Education (ARACIS) and must be periodically reviewed at every five years. Universities can be public (the majority in the country) or private, either have to be consistent with the ARACIS requirements.

Higher education in Romania is organized according to the Bologna agreement in three levels:

- Bachelor program (three years in traditional universities, four years in technical universities)
- Master program (two years)
- PhD program (three years)

**Bachelor program**

The "*Bacalaureat*" Diploma (certificate of graduating high-school education), granted after a national examination, is a prerequisite for admission to higher education. Universities and faculties may decide to organize additional admission exams and most faculties in Computer Science enroll students based on their own exams.

A bachelor program consists of 180 ETCS (typically three years) or 240 ETCS (typically four years) and include a mandatory period on internship. Additional to the final examination (*examen de licenţă*), the presentation of a bachelor dissertation, developed over the last 12 months of the studies, in parallel with courses, might be required. In Computer Science the degree granted is either *Licentiat* or *Inginer*.

**Master program**

The admission conditions for master programs vary from one faculty to another, typically a Bachelor level degree is required. Master studies include 120 ETCS, and internships are optional. Students are expected to write and defend a master thesis at the end of their studies.

**PhD program**

A candidate for PhD in Computer Science in Romania must have a Bachelor and a Master degree in Computer Science or equivalent subject, and is expected to attend some courses and develop yearly technical reports. The candidate will have a supervisor professor and an advisory board. In order to obtain the title, the candidate must write a doctor thesis, defend it in front of a committee, and also satisfy the publication criteria imposed by CNATDCU (National Council for University Titles, Diplomas and Certificates). The PhD program lasts typically three years, can be extended for a maximum of two years in case of interruption for medical reasons or maternity leave. Finally, there is also a "grace" period of two more years for finishing the thesis.

## 4.13 Spain

Higher education in Spain follows the European Higher Education Area (EHEA) guidelines since 2010. Official qualifications consist of three cycles:

- First cycle: Bachelor program (four years)
- Second cycle: Master program (two years)
- Third cycle: PhD program (maximum of three years if full-time; maximum of five years if part-time)

Both the title of Master and Bachelor are linked to the following branches of knowledge: Arts and Humanities; Science; Health Sciences; Social and Legal Sciences; Engineering and Architecture. Higher education in Informatics provides degrees in the Engineering and Architecture area.

Degree programs are defined by the Ministry of Education, Culture and Sport at very high level in terms of teaching goals and required disciplines. Each University can then specialize this general framework, design its curricula and fix the contents, which always conform to the minimum quality criteria required and agreed upon by all countries of the EHEA.

The curricula of the official degree programs, approved by the universities, to be valid must be approved by the Council of Universities. There exists a national agency for accreditation (*ANECA - Agencia Nacional de Evaluación de la Calidad y Acreditación* – National Agency for Quality Assessment and Accreditation) and some regional agencies (for instance, AQU for Catalonia). Universities can be public or private but in either case they have to be consistent with the ministry's requirements. In Spain online universities also offer study program at the three cycle levels (bachelor, master and doctorate).

**Bachelor (*Grado*)**

To enter a Bachelor program in Spanish Universities students must have a diploma from the secondary school called "*Bachillerato"*. University candidates must have passed either of the following:

- *Bachillerato* + university entrance examination (*selectividad*).
- Higher cycle vocational courses + university entrance examination (*selectividad*).
- University entrance examination for students over 25 years old.

The workload required in a Bachelor's degree program is 240 ECTS credits. Studies are spread over four academic years (including a final project).

**Master**

In order to apply for admission in a Master's program candidates must hold an official university degree, issued by a Spanish university or by a HEI within the EHEA. Each university decides on the number of students who may be admitted to Master's degree programs. The goal of university Master's degree programs is to provide students with advanced specialised or multidisciplinary training, geared towards academic or professional specialisation, or towards the acquisition of basic research skills. Master's degrees can be professionally, academically or research oriented. The workload required in a Master's degree program ranges from 60 to 120 ECTS credits. University Master's degree programs require students to write and defend a Master's thesis, which is awarded between 6 and 30 ECTS credits.

**Doctorate**

The doctoral studies are organized through programs according to the university laws and in accordance with the criteria established by the Ministry of Education, Culture and Sport. Studies may include courses, seminars or other activities aimed at research training and at the end a doctoral thesis, which incorporates original research results, must be defended. The maximum duration of doctoral studies full-time is three years, from admission to thesis defense. Doctorate programs can also be part time in this case the maximum duration of the program is five years, from admission to thesis defense. In addition to the doctoral program, PhD candidates must write, submit and defend a Doctoral thesis, which consists of an original research project which requires a defence, in public session, in front of a board of examiners who are in charge of its evaluation. In general, for admission to an official doctoral program the applicant needs to be in possession of a Spanish official master's degree, or equivalent.

**About Spanish Universities**

The University System in Spain is composed of 82 universities, 50 of which are public and 32 are private. There are also universities specialized on distance training that offer bachelor, master and doctoral degrees. Also, an increasing

number of public and private universities offer the possibility of online studies. There is no classification in “Research” Universities and “Applied Sciences” Universities. A University can provide just a few or many degrees.

Most Spanish universities divide the academic year into two semesters. The first one usually begins in September, it ends late December, and January is the exam period. The second semester starts in late January or early February and ends in May, with June as the exam period. A few universities organize their academic calendar quarterly.

## 4.14 Switzerland

Three distinctive properties set the Swiss system of higher education apart from the situation in many neighboring countries:

- The Swiss government does not wish to increase the share of the population going to Universities. In fact, the minister of education explicitly stated in 2012 that it was already too high [SW4].
- This view follows from a general policy of dividing education into tracks at different levels, including a strong emphasis on apprenticeship and the presence of Universities of Applied Sciences (*Fachhochschulen*, *Écoles des Hautes Études, Scuola Universitaria Professionale*) alongside Universities. Where France, for example, awards the *Baccalauréat* (high-school degree) to 87.9% of students (80% of a generation) [FR1] the correspond*ing Maturität/Maturité figure in Switzerl*and is only about 20% [SW4]. The avowed purpose is to avoid channel too many students into tracks where they have little chance of succeeding. On the other the hand the tracks are designed to allow for horizontal mobility between them at any stage. This means that, for example, outstanding students in the apprenticeship or professional track may decide to move later to an university.
- As in other aspects of Swiss life, local devolution plays an important role. Most Swiss Universities are cantonal: University of Basel, Bern, Fribourg, Geneva, Lausanne, Lucerne, Lugano, Neuchatel, St. Gallen, Zurich. Only two Universities are under the responsibility of the Federal Government, the two Federal Institutes of Technology, ETH Zurich and EPF Lausanne. Cantonal Universities receive financial support from the Confederation and from those cantons which do not have their own University.

Since 2001, Swiss Universities have been rapidly adjusting their curricula to comply with the Bologna Declaration. Today, all degree courses have been adapted to the Bologna system. Under the Bologna system the Bachelor's degree is the first step in scientific formation, allowing students to acquire a methodological and scientific approach to their education. In the Bologna system, one academic year corresponds to 60 ECTS credits, which are equivalent to 1,500-1,800 hours of study. This includes contact hours (lectures, seminars, practical work, etc.), as well as independent study at home or in a library. Attainment of the Bachelor's degree requires three years of full-time study (180 ECTS-credits). The Bachelor's degree is a pre-requisite for enrollment in a Master's program. It can in some cases lead directly to a Master of Advanced Studies (MAS). However, a Bachelor's degree is not sufficient for enrollment in a doctoral program, which requires the attainment of a Master's degree as well.

All Bachelor programs are open to students in possession of a valid secondary school diploma, a Swiss school-leaving certificate, or a foreign degree that has been deemed equivalent. The prerequisite for access to a Master's program is a successfully completed Bachelor's program. Each University makes its own decisions as to whether a Bachelor's degree obtained in a foreign country gives its holder access to Master's programs - with or without entrance examinations, under certain conditions, with further requirements, or no access at all. The University may set additional requirements, equally applicable to all candidates, for admission to specialized Master's programs.

In the second cycle of studies, students will further advance their knowledge and specialize in a particular field, or acquire an interdisciplinary formation. This program is completed with the writing of a master's thesis. In the Bologna system, a Master's program lasts three to four semesters (depending on the field of study) and awards 90 to 120 ECTS credits.

Doctorate degrees are generally awarded after 3-5 years of postgraduate research and study, and submission of a thesis. A Master's degree and a high grade average during the Master's studies are the main pre-requisites for admittance to a doctoral program. In Switzerland, only the twelve state-run university institutions of academic learning (10 cantonal Universities, plus 2 Federal Institutes of Technology) are allowed to award doctoral degrees.

Application to a doctoral program is subject to specific conditions, the most important of which are the acceptance of the thesis proposal by the Faculty and a professor willing to be the supervisor. The doctoral candidate must perform original research for the thesis and defend the thesis content before a committee of professors. In some universities, depending on the Faculty or the field of research, the student must also complete an advanced course of study, and pass comprehensive examinations on the subject, or/and attend specific doctoral seminars offered by the University. PhD Candidates in Switzerland are usually employed by the Universities, having temporary contracts as research assistants. Their tasks include research, teaching and supervision of undergraduate students. For admission to the PhD examination, a Master's degree (or equivalent) is required. PhD Candidates submit a thesis, which is examined by a (usually small, e.g., three members) 'manuscript committee'. After approval there is a public defense in front of a bigger committee including the manuscript committee.

## 4.15 UK

In England, Wales and Northern Ireland bachelor's degrees are usually three year programs, with students' studies focused almost exclusively on the degree discipline. In Scotland the bachelor's degree is usually a four-year degree, and during the first two years the students spend one third of their time on Informatics, one third on Mathematics and one third on any other subjects of their choice. Of course there are some exceptions to these general patterns; for example, some degrees include a year of industrial placement. Most degrees are termed *Honours* degrees, and the final years, where more advanced material is taught are called the *Honours* years. The alternative is an Ordinary (pass) degree. This is typically a premature exit route, or lower degree offered to those unable to complete the *Honours* degree. For example, in Scotland this is offered to students who successfully complete the first three years of the degree but do not enter or successfully complete fourth year. All students generally enter the University registered for an *Honours* degree.

Entry to University is centrally organized by UCAS (Universities and College Admissions Service). In the autumn of the final year of secondary school students apply to up to five programs through UCAS. They may receive offers based on their actual or predicted grades in national exams (A-levels in England, Wales and Northern Ireland, Highers and Advanced Highers in Scotland). Many courses have standard offers in terms of the grades that they expect students to have achieved before entering the program, but they may relax these for individual students that they particularly want. In the spring students must select a preferred offer, and a secondary offer (usually with lower grades). The national exams are taken in May and results are published in August. Students who match their preferred offer grades take up the places offered. Other students enter a process known as Clearing, in which UCAS tries to match them with programs in the same discipline that still have places and are willing to accept the lower grades.

Most MSc courses in the UK are one year programs, taking a full 12 months (in contrast to undergraduate programs which usually only operate over 9 months of the year). Entry into the program is made on the basis of the applicant's undergraduate degree. For UK students at least an upper second class degree is expected. Entrance is handled by each program within each University in a distributed manner: there is no equivalent to UCAS.

Within the UK there is a standard of transferrable credits system. This is not ECTS but is compatible with it, so that the equivalent ECTS values can be found when necessary. Within the UK credit systems, 10 credits correspond to a module entailing approximately 100 hours of work, and would be typically be one course over one semester. The standard load for undergraduates is 120 credits per year; for MSc students, 180 credits.

In the undergraduate programs, progression is judged from year to year and generally requires that the requisite number of credits at the appropriate level have been achieved in the previous year. In bachelor's degrees the major

component of assessment will be written exams, either taken at the end of the course or at the end of the year. For computer science there will also typically be some practical component. For *Pre-Honours* years, students who fail a course may resit[9] the exam, up to three times. Exams are usually offered twice per year: in the main diet9 and in the resit diet9. Thus a student who fails an exam twice will be required to repeat the year. Once students have entered the *Honours* years they usually need to pass the exams at the first sitting to achieve *Honours*.

MSc students are assessed in a similar way, with exams at the end of the course or the end of the year, although it is a little more likely here to have some courses that are assessed on the basis of coursework only, without a written exam. Students must successfully pass all courses before they are allowed to progress to the project. Some universities permit resits for MSc exams, but many do not. Successful completion of the MSc degree requires both the taught element and the project to be passed. Students who successfully complete some courses but not sufficient to gain admittance to the project stage of the MSc are awarded a Post-graduate Certificate or Post-graduate Diploma depending on the number of credits achieved.

A dissertation project is an integral part of an *Honours* degree and is typically performed over six months in parallel with courses in the final year. Failure of the project will generally mean that the student cannot be awarded an *Honours* degree and will be awarded a Pass degree instead. Students who do not manage to pass the requisite number of courses for an Ordinary degree may be awarded a Certificate of Higher Education.

For an MSc program, the dissertation project typically takes place after courses have been completed (and successfully passed), and lasts for about 3 months at the end of the program.

With a few exceptions, industrial placements or internships are not required for most undergraduate or MSc degrees in the UK. However, many undergraduates undertake internships during the summer vacation before their final year. This is encouraged by the Universities but does not accrue any credit for the student's program. Since the MSc program is typically a full 12 months there is no opportunity for industrial placements or internships during the program.

Like admission to MSc programs, admission to PhD programs is handled in a distributed manner for each department, or even subgroups within departments. Each applicant is judged on a case-by-case basis so it is difficult to give any general rules. However, if the applicant is from the UK a bachelor's degree of at least upper second class will be required. Most PhD programs do not require an MSc, but some programs funded by the UK government through the Engineering and Physical Sciences Research Council (EPSRC) as Centres of Doctoral Training, are four year programs and incorporate a Master's degree within the first year. However, this is often a MRes (MSc by research) rather than a taught MSc, and has a much higher proportion of dissertation work and only a few taught courses.

Students are often admitted to PhD programs on one-year probation, and only gain full admission to the program at the end of the first year after some progression hurdle. This typically involves writing a thesis proposal document and defending it to a small committee of academics. The final examination of a PhD is through the written dissertation and a closed oral examination, termed a *viva*. Each student has two examiners: one from another University, one from the same department who has not been formally involved in the supervision of the student. The student submits a version of the dissertation to be assessed by the examiners before the *viva*, and then has an opportunity to discuss the work in the *viva*. After the *viva* the examiners make recommendations about the award of the degree and any corrections that they require to the dissertation.

Practice varies between universities, but vivas are generally closed with only the examiners, student and possibly the supervisor present. There is no formal requirement for publications from the dissertation to have appeared before

[9] "Resit" and "diet" are commonly used academic terms in the UK. A resit is a repeat exam in the sense that the student is examined on the material as previously presented although the examination paper is new — no further teaching is involved before the examination. The term "resit" is widely used but it is not universal (for example, at the University of Southampton these are called "referred exams"). Exams are only offered at certain times of the year and each of these times is known as "diet". For example in Edinburgh there is the December diet, the April diet and the August diet (which is the resit diet) [Jane Hillston, personal communication]

the viva, although in practice most students will have at least two or three publications at this stage. Most universities have a minimum period of study of three years for a PhD and a maximum of four years.

# 5 Student enrollments

The following tables show enrollment and ratios both for population and gender at the bachelor's and master's levels in the selected countries.

Table 2 provides information on first-year students, which is particularly interesting to track for trends in enrollment resulting in part from changes in the popularity of Informatics. Table 3 covers bachelor-program students, or "undergraduates" in the American terminology. Table 4 covers master-program data where available.

Any country comparisons made on the basis of these tables must **exercise caution** because of three factors: differing degree programs, explained after each table; differing notions of "Informatics", in particular for mixed degrees, as discussed in Section 3; different organization of the systems of higher education, as discussed in Section 4, where in some countries there is an explicit distinction between "Research Universities" and "Universities of Applied Sciences". In all tables for those countries where such a distinction exists, data has been presented separately: in these cases, the line marked "RU" refers to data from "Research Universities" and the line marked "UAS" refers to data from "Universities of Applied Sciences".

Numbers per 1,000,000 inhabitants were calculated, for all years, using as basis the following data for the national populations: Austria (8,504,850), Belgium (11,267,910) Denmark (5,627,235), Estonia (1,313,271) Germany (80,716,000), Greece (10,816,286), Ireland (4,593,100), Italy (60,782,668), Latvia (2,001,468), The Netherlands (16,848,600), Romania (19,870,000) Spain (46,464,053), (Switzerland (8,136,700) and UK (63,705,000).

## 5.1 First year students

Table 2 presents numbers of first year students at bachelor level.

| *Table 2. Students in Informatics bachelor's programs (first year)* | | | | | | | | | | | | | *(Ratio = Total/1,000,000 inhabitants)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | |
| | | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio |
| (RU) | Austria | 2,141 | 252 | 1,958 | 230 | 1,949 | 229 | 2,187 | 257 | 2,337 | 275 | (a) | (a) |
| (UAS) | Austria | 492 | 58 | 500 | 59 | 530 | 62 | 520 | 61 | 509 | 60 | (a) | (a) |
| (RU) | Belgium | 425 | 31 | 468 | 33 | 507 | 30 | 493 | 44 | (a) | (a) | (a) | (a) |
| (UAS) | Belgium | 3,235 | 287 | 3,236 | 287 | 3,588 | 318 | 3,807 | 230 | (a) | (a) | (a) | (a) |
| (RU) | Denmark | 779 | 139 | 971 | 173 | 1,071 | 190 | 1,104 | 196 | *1,196* | *213* | 1,061 | 189 |
| (UAS) | Denmark | 147 | 26 | 130 | 23 | 133 | 24 | *169* | 30 | 155 | 28 | (b) | (b) |
| (RU) | Estonia | 613 | 467 | 623 | 474 | 772 | 588 | 674 | 513 | 607 | 462 | 617 | 470 |
| (UAS) | Estonia | 495 | 377 | 510 | 388 | 490 | 373 | 414 | 315 | 339 | 258 | 390 | 297 |
| (RU) | Germany | 12,303 | 152 | 16,136 | 200 | 16,605 | 205 | 18,447 | 229 | 20,227 | 251 | (a) | (a) |
| (UAS) | Germany | 15,467 | 192 | 18,087 | 224 | 19,159 | 237 | 19,213 | 238 | 20,652 | 256 | (a) | (a) |
| | Greece | 3,217 | 297 | 3,390 | 313 | 3,587 | 332 | *4,373* | *404* | 5,519 | 510 | (a) | (a) |
| (RU) | Ireland | 692 | 151 | 819 | 178 | 966 | 210 | 959 | 209 | 1,050 | 229 | 1,049 | 228 |
| (UAS) | Ireland | 1,720 | 374 | 1,859 | 405 | 2,070 | 451 | 2,144 | 467 | 1,981 | 431 | 2,044 | 445 |
| | Italy | 14,551 | 239 | 15,404 | 253 | 15,005 | 247 | 16,043 | 264 | 17,223 | 283 | (a) | (a) |
| | Latvia | 1,608 | 803 | 1,687 | 843 | 1,918 | 958 | 1,832 | 915 | 1,731 | 872 | 1,803 | 902 |
| (RU) | Netherlands | 964 | 57 | 1,022 | 61 | 1,094 | 65 | 1,374 | 82 | 1,476 | 88 | (a) | (a) |
| (UAS) | Netherlands | 5,142 | 305 | 5,512 | 327 | 5,604 | 333 | 6,203 | 368 | 6,466 | 384 | (a) | (a) |
| | Romania | 2,497 | 126 | 2,397 | 121 | 2,473 | 124 | 2,670 | 134 | 2,962 | 149 | 3,250 | 164 |
| | Spain | 13,592 | 293 | 13,612 | 293 | 13,805 | 297 | 13,740 | 296 | 12,745 | 274 | (a) | (a) |
| (RU) | Switzerland | 387 | 48 | 396 | 49 | 408 | 50 | 462 | 57 | 517 | 64 | 539 | 66 |
| (UAS) | Switzerland | 645 | 79 | 667 | 82 | 742 | 91 | 811 | 100 | 819 | 101 | 887 | 109 |
| | UK | 31,120 | 489 | 29,880 | 469 | 25,475 | 400 | 28,240 | 443 | 28,805 | 452 | (a) | (a) |

*Numbers in italics*: updated since the previous edition of the report, for reasons that are explained in the country notes.

(a) Data will be available in the next edition of the report

(b) Data not available due to changes in the archival system

The definition of bachelor programs is the following for each country considered:

**Austria RU**: studies aiming at a Bachelor degree offered by Universities (*Universitäten*) [AT3].
**Austria UAS**: studies aiming at a Bachelor degree offered by Universities of Applied Sciences (*Fachhochschulen*) [AT3].

**Belgium RU:** studies aiming at a Bachelor degree offered by Universities (*Universiteiten/ Universités*) [BE3, BE4].
**Belgium UAS:** studies aiming at a Bachelor degree offered by University Colleges (*Hogescholen/Hautes Écoles*) [BE4, BE5].

**Denmark RU**: studies aiming at a Bachelor degree offered by Universities (*Universiteter*) [DK3].

**Denmark UAS***:* studies aiming at a Professional Bachelor degree offered by University Colleges (*Professionshøjskoler*) [DK3].
For Denmark numbers are updated once each year. In connection with the next updating the numbers of the most recent year will be subject to changes, they are regarded as temporary and will be replaced by new numbers in the subsequent year. This explains the small difference in the 2014/15 data (in this and all subsequent tables) when compared to the corresponding tables in the previous edition of this report.

**Estonia RU**: studies aiming at a Bachelor degree offered by Universities (*Ülikoolid*) [EE1].
**Estonia UAS**: studies aiming at a Bachelor degree offered by Universities of Applied Sciences (*Rakenduskõrgkoolid*) [EE1].

**Germany RU**: studies aiming at a University degree (*Universitärer Abschluss*) including Bachelor*, Lizenziat/ Diplom* and Others (phasing out after the Bologna reform) [GE4-GE5]. Numbers for studies aiming at a teaching degree (*Lehramtsprüfung*) were not included.
**Germany UAS**: studies aiming at a University of Applied Sciences degree *(Fachhochschulabschluss)* including Bachelor and *Diplom* [GE4-GE5].

**Greece:** studies aiming at a Bachelor degree offered by Universities [GR1].
Note that a small error was found for the 2013/14 data affecting Table 2, 2bis and Table3, 3bis.

**Ireland RU***:* studies aiming at a Bachelor *Honours* degree offered by Universities [IR1].
**Ireland UAS**: studies aiming at a Bachelor *Honours* degree offered by Institutes of Technology [IR1].

**Italy**: studies aiming at a Bachelor degree (*Laurea Triennale*) offered by Universities, both in Science faculties (*Scienze e Tecnologie Informatiche* degree) and in Engineering faculties (*Ingegneria dell'Informazione* degree) [IT2]. Degree programs according the pre-Bologna system have not been accounted.

**Latvia:** studies aiming at a Bachelor degree offered by HEIs (A*ugstskola*, *Akadēmija* or *Universitāte*) [LV1].

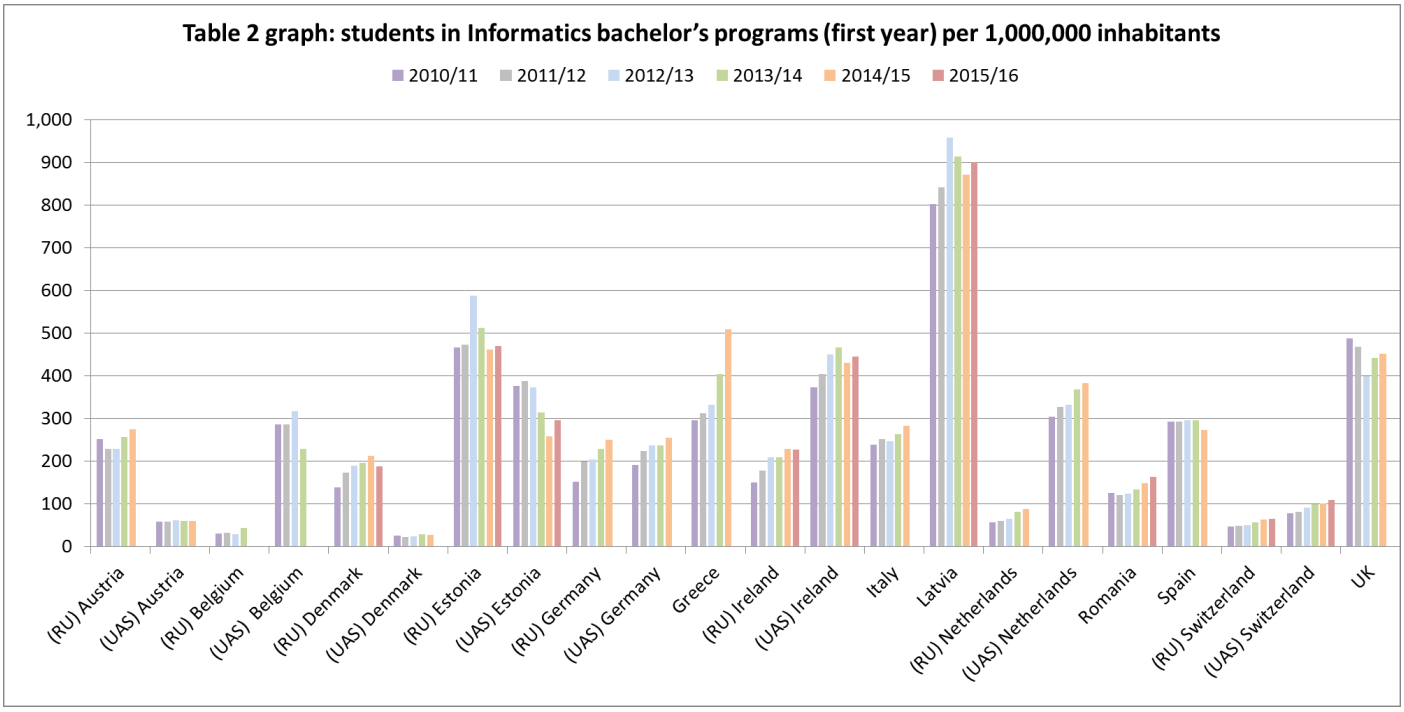
**Netherlands RU**: studies aiming at Bachelor and *oude stijl doctoraalopleidingen* degree (old-style doctoral program, phasing out after the Bologna reform [NE3]) in Research Universities (*Wetenschappelijk onderwijs*) [NE4].
**Netherlands UAS**: studies aiming at a Bachelor degree in Universities of Applied Sciences (*Hogescholen*, *Hoger Beroepsonderwijs*) [NE4].

**Romania:** studies aiming at a Bachelor degree offered by Universities (*Universități*) [RO1].

**Spain:** studies aiming at a Bachelor degree offered by Universities (*Universidad*) [SP1].

**Switzerland RU**: studies aiming at Bachelor, *Lizenziat/Diplom* and Others (phasing out after the Bologna reform) degrees in research Universities (*Universitäten*). Numbers for studies aiming at a teaching (*Lehramtsprüfung)* were not included [SW5, SW6].
**Switzerland UAS**: studies aiming at Bachelor and *Diplom* (phasing out after the Bologna reform) [SW5] in Universities of Applied Sciences (*Fachhochschulen*) in the following programs: Informatics, Information Technology and Medical Informatics [SW5, SW6].

**UK**: numbers include studies aiming at "First Degree" and "Other Undergraduate" degree [UK5]. The UK has a unique higher-education system, with a variety of degrees at the undergraduate level and a complex system of options [UK6]. In addition, the numbers include full and part-time students (full time: attending an institution for periods amounting to at least 24 weeks within the year of study) [UK6].




| *Table 2bis. Women percentage of students in Informatics bachelor's programs (first year)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010/11** | **2011/12** | **2012/13** | **2013/14** | **2014/15** | **2015/16** |
| **(RU)** | **Austria** | 23.6 | 19.7 | 21.1 | 23.6 | 23.7 | (a) |
| **(UAS)** | **Austria** | 16.3 | 18.2 | 21.9 | 18.7 | 20.4 | (a) |
| **(RU)** | **Belgium** | 7.3 | 7.1 | 5.9 | 5.7 | (a) | (a) |
| **(UAS)** | **Belgium** | 5.6 | 5.4 | 6.0 | 6.0 | (a) | (a) |
| **(RU)** | **Denmark** | 13.7 | 13.4 | 16.1 | 14.1 | *16.6* | 15.2 |
| **(UAS)** | **Denmark** | 10.9 | 14.6 | 6.0 | *6.5* | 5.8 | (a) |
| **(RU)** | **Estonia** | 17.0 | 15.6 | 21.2 | 20.8 | 20.9 | 21.7 |
| **(UAS)** | **Estonia** | 21.0 | 23.7 | 22.0 | 31.6 | 32.7 | 32.3 |
| **(RU)** | **Germany** | 19.4 | 19.7 | 21.5 | 23.0 | 23.7 | (a) |
| **(UAS)** | **Germany** | 18.8 | 19.9 | 21.7 | 20.8 | 21.8 | (a) |
| | **Greece** | 22.5 | 20.9 | 19.0 | *22.2* | 21.7 | (a) |
| **(RU)** | **Ireland** | 13.7 | 17.6 | 15.9 | 17.0 | 16.8 | 20.0 |
| **(UAS)** | **Ireland** | 17.1 | 13.9 | 14.1 | 15.4 | 14.1 | 15.1 |
| | **Italy** | 17.9 | 18.9 | 18.9 | 19.0 | 18.9 | (a) |
| | **Latvia** | n.a | n.a | n.a | n.a | n.a | 15.8 |
| **(RU)** | **Netherlands** | 11.9 | 11.8 | 13.8 | 14.9 | 14.7 | (a) |
| **(UAS)** | **Netherlands** | 14.6 | 15.9 | 16.1 | 17.3 | 17.3 | (a) |
| | **Romania** | 24.9 | 27.7 | 26.6 | 29.3 | 25.3 | 29.6 |
| | **Spain** | 13.0 | 12.4 | 12.6 | 12.3 | 11.4 | (a) |
| **(RU)** | **Switzerland** | 14.0 | 13.1 | 10.3 | 13.4 | 12.4 | 15.8 |
| **(UAS)** | **Switzerland** | 9.1 | 7.5 | 10.1 | 8.6 | 11.0 | 10.0 |
| | **UK** | 18.1 | 17.0 | 15.9 | 15.3 | 15.3 | (a) |

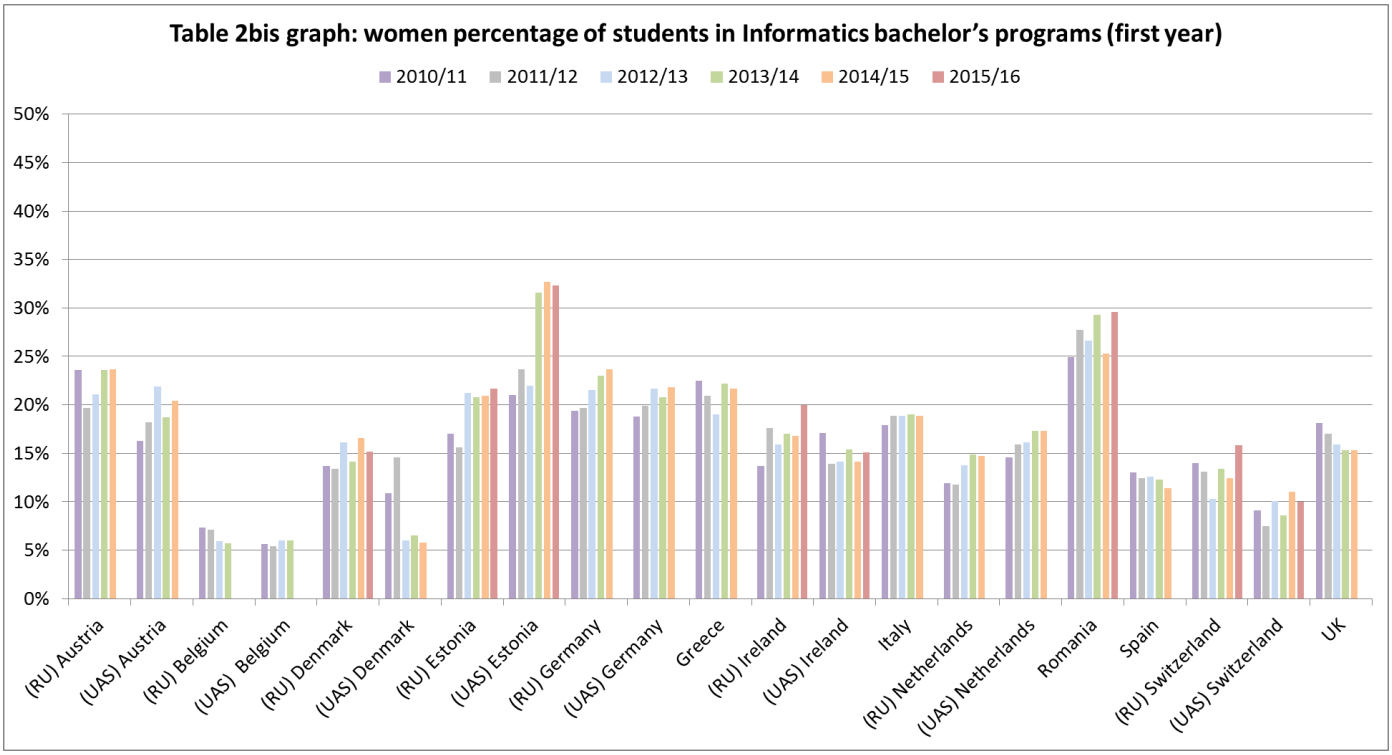


Table 2bis graph: women percentage of students in Informatics bachelor's programs (first year)
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
(RU) Austria
(UAS) Austria
(RU) Belgium
(UAS) Belgium
(RU) Denmark
(UAS) Denmark
(RU) Estonia
(UAS) Estonia
(RU) Germany
(UAS) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
(RU) Netherlands
(UAS) Netherlands
Romania
Spain
(RU) Switzerland
(UAS) Switzerland
UK

## 5.2 Bachelor students

Tables 3 and 3bis present the data for all students enrolled in bachelor programs. Sources and footnotes are the same as for table 2. Additional footnotes provide detail for specific situations in some countries.

| *Table 3. Students in Informatics bachelor's programs (all semesters)* | | | | | | | | | | | | *(Ratio = Total/1,000,000 inhabitants)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | |
| | | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio |
| (RU) | Austria | 8,564 | 1,007 | 8,342 | 981 | 7,976 | 938 | 8,159 | 959 | 8,417 | 990 | (a) | (a) |
| (UAS) | Austria | 1,098 | 129 | 1,106 | 130 | 1,141 | 134 | 1,137 | 134 | 1,129 | 133 | (a) | (a) |
| (RU) | Belgium | 1,576 | 140 | 1,649 | 146 | 1,676 | 149 | 1,748 | 117 | (a) | (a) | (a) | (a) |
| (UAS) | Belgium | 8,692 | 771 | 8,658 | 768 | 9,018 | 800 | 9,682 | 859 | (a) | (a) | (a) | (a) |
| (RU) | Denmark | 2,071 | 368 | 2,400 | 426 | 2,628 | 467 | 2,948 | 524 | *3,127* | *556* | 2,917 | 518 |
| (UAS) | Denmark | 147 | 26 | 139 | 25 | 184 | 33 | 181 | *32* | 199 | 35 | (a) | (a) |
| (RU) | Estonia | 1,906 | 1,451 | 1,970 | 1,500 | 2,117 | 1,612 | 2,128 | 1,620 | 2,087 | 1,589 | 1,988 | 1,514 |
| (UAS) | Estonia | 1,641 | 1,250 | 1,669 | 1,271 | 1,736 | 1,322 | 1,590 | 1,211 | 1,461 | 1,112 | 1,373 | 1,045 |
| (RU) | Germany | 53,339 | 661 | 57,828 | 716 | 61,351 | 760 | 65,213 | 808 | 68,788 | 852 | (a) | (a) |
| (UAS) | Germany | 59,796 | 741 | 64,770 | 802 | 68,867 | 853 | 72,116 | 893 | 76,103 | 943 | (a) | (a) |
| | Greece | 13,907 | 1,286 | 14,062 | 1,301 | 14,271 | 1,319 | *15,995* | *1,479* | 17,948 | 1,659 | (a) | (a) |
| (RU) | Ireland | 2,403 | 523 | 2,648 | 577 | 3,396 | 739 | 3,313 | 721 | 3,710 | 808 | 3,857 | 840 |
| (UAS) | Ireland | 2,217 | 483 | 2,734 | 595 | 3,204 | 698 | 3,470 | 755 | 4,622 | 1,006 | 4,131 | 899 |
| | Italy | 68,251 | 1,123 | 67,198 | 1,106 | 66,887 | 1,100 | 68,518 | 1,127 | 71,673 | 1,179 | (a) | (a) |
| | Latvia | 4,453 | 2,225 | 4,506 | 2,151 | 4,518 | 2,257 | 4,598 | 2,297 | 4,303 | 2,150 | 4,584 | 2,292 |
| (RU) | Netherlands | 6,125 | 364 | 6,368 | 378 | 6,637 | 394 | 7,545 | 449 | 8,291 | 492 | (a) | (a) |
| (UAS) | Netherlands | 22,292 | 1,323 | 23,458 | 1,392 | 24,012 | 1,425 | 25,969 | 1,541 | 27,378 | 1,625 | (a) | (a) |
| | Romania | 7,159 | 360 | 6,807 | 343 | 7,122 | 358 | 7,376 | 371 | 8,144 | 410 | 8,837 | 445 |
| | Spain | 38,980 | 836 | 42,134 | 903 | 41,293 | 885 | 42,555 | 912 | 40,654 | 875 | (a) | (a) |
| (RU) | Switzerland | 1,386 | 170 | 1,505 | 185 | 1,557 | 191 | 1,627 | 200 | 1,809 | 222 | 1,935 | 238 |
| (UAS) | Switzerland | 2,336 | 287 | 2,425 | 298 | 2,558 | 314 | 2,722 | 335 | 2,869 | 353 | 3,066 | 377 |
| | UK | 76,540 | 1,201 | 76,590 | 1,202 | 73,015 | 1,146 | 74,895 | 1,176 | 76,480 | 1,201 | (a) | (a) |

**Netherlands**: unlike for other countries, data includes students enrolled at all levels (*Ingeschrevenen*) including Bachelor and the old-style doctoral program (phasing out after the Bologna reform [NE3]) as well as a Master and PhD [NE4]. Separate numbers for the distinct levels were not available[10]. Note also that the numbers for the UAS are considerably higher than the numbers for RU in part because Bachelor studies at RU are 3-year programs while at UAS 4-year programs (see Section 4.11).

[10] Centraal Bureau voor de Statistiek, personal communication.

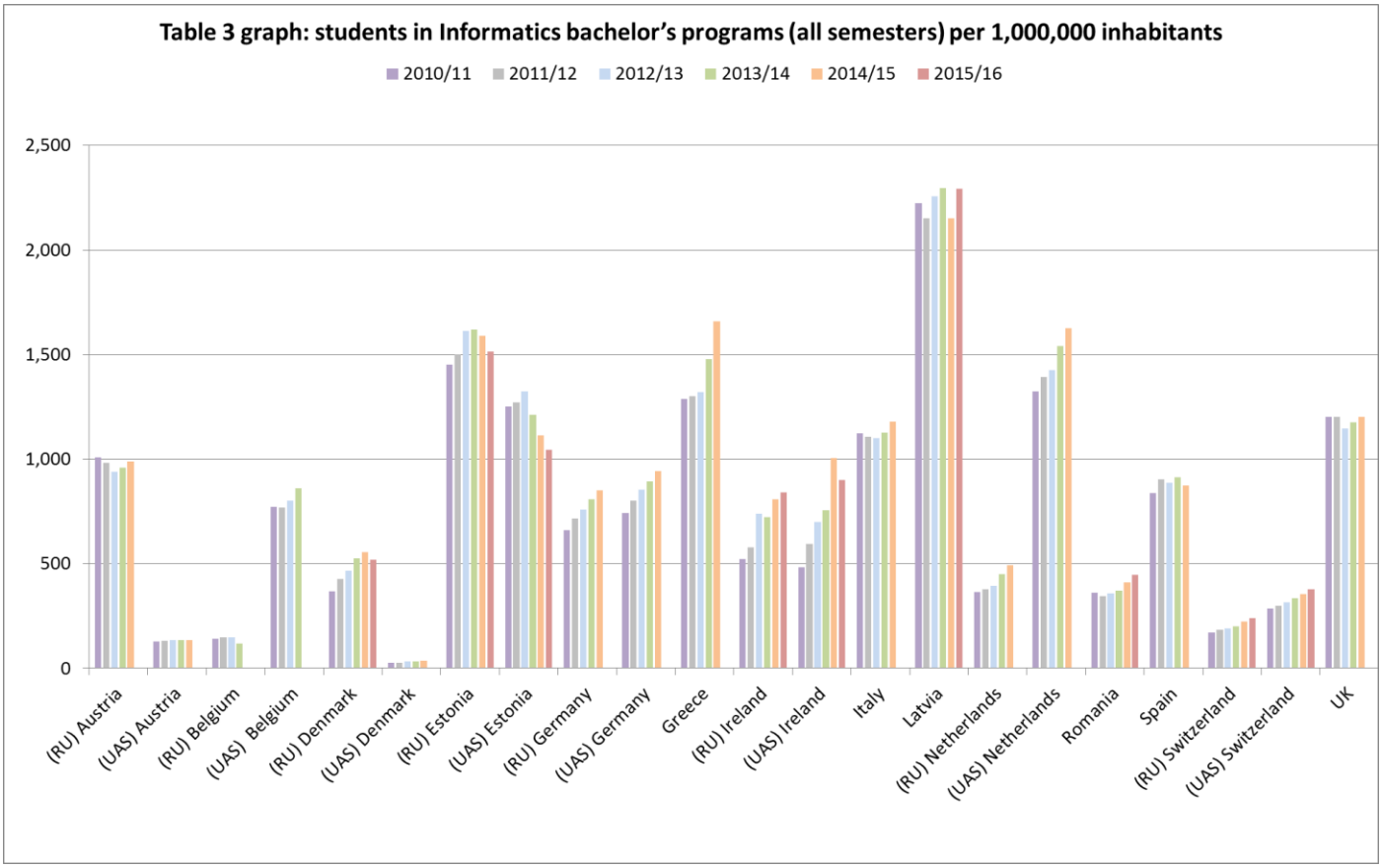


Table 3 graph: students in Informatics bachelor's programs (all semesters) per 1,000,000 inhabitants
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
2,500
2,000
1,500
1,000
500
0
(RU) Austria
(UAS) Austria
(RU) Belgium
(UAS) Belgium
(RU) Denmark
(UAS) Denmark
(RU) Estonia
(UAS) Estonia
(RU) Germany
(UAS) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
Latvia
(RU) Netherlands
(UAS) Netherlands
Romania
Spain
(RU) Switzerland
(UAS) Switzerland
UK

| *Table 3bis. Women percentage of total students in Informatics bachelor's programs (all semesters)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010/11** | **2011/12** | **2012/13** | **2013/14** | **2014/15** | **2015/16** |
| **(RU)** | **Austria** | 18.1 | 17.5 | 17.4 | 17.9 | 18.4 | (a) |
| **(UAS)** | **Austria** | 16.8 | 15.8 | 17.6 | 19.5 | 19.4 | (a) |
| **(RU)** | **Belgium** | 6.9 | 6.6 | 6.4 | 6.7 | (a) | (a) |
| **(UAS)** | **Belgium** | 6.0 | 5.9 | 6.0 | 6.6 | (a) | (a) |
| **(RU)** | **Denmark** | 10.9 | 12.0 | 13.9 | 13.6 | *14.5* | 15.3 |
| **(UAS)** | **Denmark** | 12.6 | 14.4 | 10.3 | *9.4* | 6.5 | (a) |
| **(RU)** | **Estonia** | 19.5 | 17.6 | 19.3 | 20.0 | 20.8 | 21.3 |
| **(UAS)** | **Estonia** | 18.2 | 19.9 | 19.9 | 24.3 | 26.3 | 27.5 |
| **(RU)** | **Germany** | 15.9 | 16.4 | 17.7 | 19.0 | 20.2 | (a) |
| **(UAS)** | **Germany** | 16.6 | 17.3 | 18.4 | 19.1 | 19.6 | (a) |
| | **Greece** | 23.4 | 22.1 | 20.6 | 22.4 | 21.7 | (a) |
| **(RU)** | **Ireland** | 14.7 | 15.8 | 16.8 | 16.6 | 17.6 | 17.6 |
| **(UAS)** | **Ireland** | 14.2 | 14.9 | 13.8 | 13.3 | 13.5 | 14.9 |
| | **Italy** | 16.3 | 16.7 | 17.3 | 17.6 | 17.8 | (a) |
| | **Latvia** | 15.5 | 16.2 | 16.4 | 16.2 | 19.9 | 19.3 |
| **(RU)** | **Netherlands** | 11.9 | 12.7 | 13.7 | 14.9 | 15.5 | (a) |
| **(UAS)** | **Netherlands** | 12.9 | 13.9 | 14.8 | 15.6 | 16.5 | (a) |
| | **Romania** | 28.2 | 28.1 | 27.4 | 29.3 | 28.9 | 29.8 |
| | **Spain** | 17.2 | 14.0 | 13.6 | 13.1 | 12.0 | (a) |
| **(RU)** | **Switzerland** | 11.3 | 11.0 | 10.7 | 11.3 | 11.5 | 11.9 |
| **(UAS)** | **Switzerland** | 7.5 | 7.7 | 8.4 | 9.1 | 9.3 | 8.8 |
| | **UK** | 17.3 | 16.7 | 15.9 | 15.4 | 15.4 | (a) |

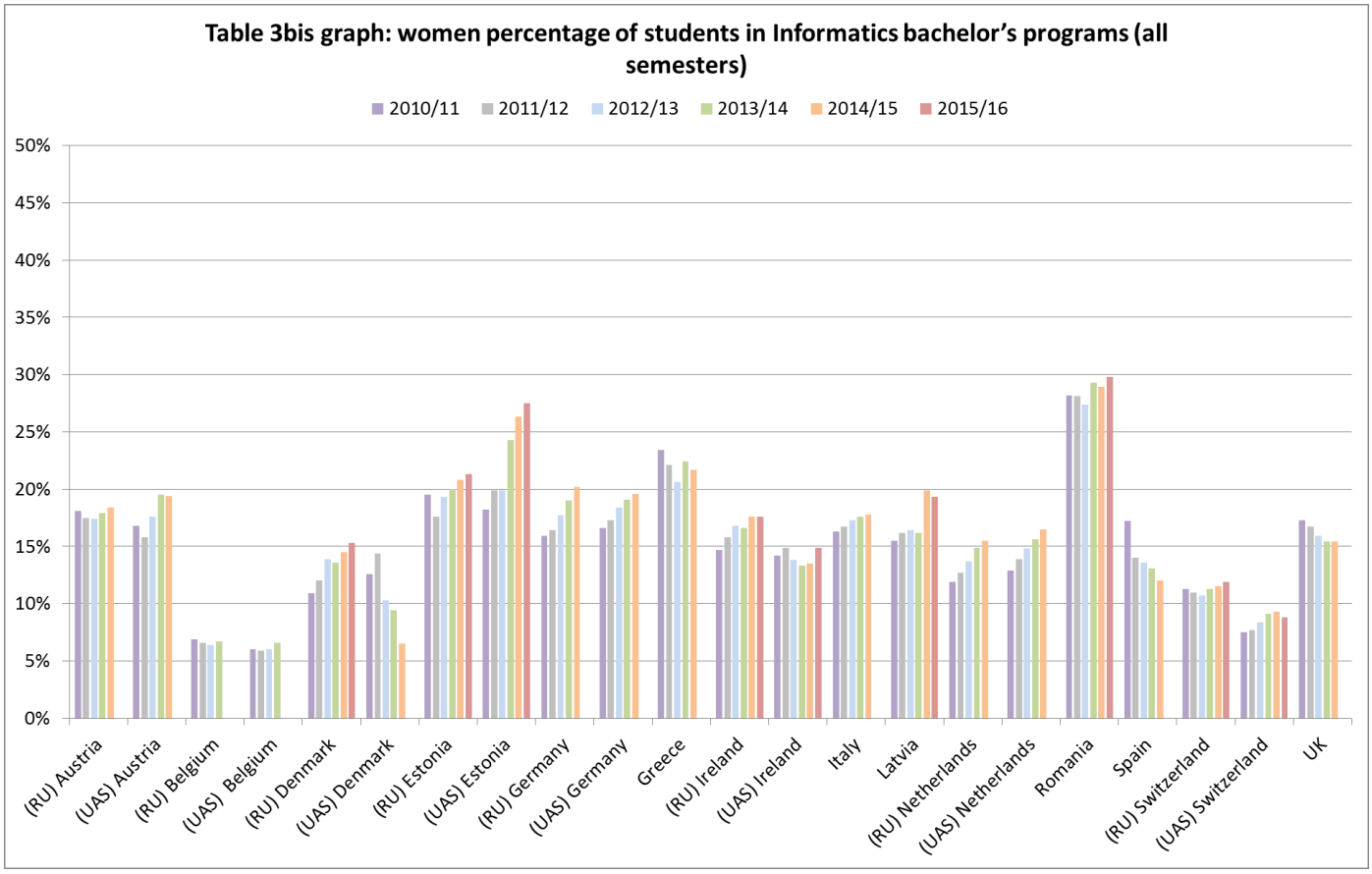


Table 3bis graph: women percentage of students in Informatics bachelor's programs (all semesters)
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
(RU) Austria
(UAS) Austria
(RU) Belgium
(UAS) Belgium
(RU) Denmark
(UAS) Denmark
(RU) Estonia
(UAS) Estonia
(RU) Germany
(UAS) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
Latvia
(RU) Netherlands
(UAS) Netherlands
Romania
Spain
(RU) Switzerland
(UAS) Switzerland
UK

## 5.3 Master students

Table 4 and 4bis present the data for all students enrolled in master's programs. Sources and footnotes are the same as for table 2. Additional footnotes provide detail for specific situations in some country.

| *Table 4. Students in Informatics master's programs* | | | | | | | | | | | | *(Ratio = Total/1,000,000 inhabitants)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | |
| | | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio |
| (RU) | Austria | 3,210 | 377 | 3,288 | 387 | 3,316 | 390 | 3,370 | 396 | 3,489 | 410 | (a) | (a) |
| (UAS) | Austria | 450 | 53 | 474 | 56 | 530 | 62 | 651 | 77 | 685 | 81 | (a) | (a) |
| (RU) | Belgium | 1,156 | 103 | 1,151 | 102 | 1,203 | 107 | 1,234 | 110 | (a) | (a) | (a) | (a) |
| (UAS) | Belgium | 126 | 11 | 88 | 8 | 108 | 10 | 138 | 12 | (a) | (a) | (a) | (a) |
| (RU) | Denmark | 1,906 | 339 | 2,078 | 369 | 2,394 | 425 | 2,449 | 435 | *2,227* | *396* | *2,318* | *412* |
| (RU) | Estonia | 749 | 570 | 797 | 607 | 877 | 668 | 893 | 680 | 950 | 723 | 1,050 | 800 |
| (RU) | Germany | 9,421 | 117 | 12,221 | 151 | 15,888 | 197 | 19,199 | 238 | 22,132 | 274 | (a) | (a) |
| (UAS) | Germany | 5,970 | 74 | 6,951 | 86 | 7,839 | 97 | 8,935 | 111 | 10,203 | 126 | (a) | (a) |
| | Greece | 3,171 | 293 | 3,136 | 290 | 2,967 | 274 | 2,805 | 259 | 3,622 | 335 | (a) | (a) |
| (RU) | Ireland | 1,104 | 240 | 1,093 | 238 | 1,347 | 293 | 1,396 | 304 | 1,175 | 256 | 1,145 | 286 |
| (UAS) | Ireland | 382 | 83 | 529 | 115 | 587 | 128 | 695 | 151 | 592 | 129 | 541 | 119 |
| | Italy | 10,023 | 165 | 9,504 | 156 | 9,478 | 156 | 9,057 | 149 | 8,975 | 148 | (a) | (a) |
| | Latvia | 1,151 | 575 | 1,182 | 591 | 1,202 | 601 | 1,191 | 595 | 1,389 | 693 | 1,249 | 625 |
| | Romania | 2,296 | 116 | 2,013 | 101 | 1,994 | 100 | 2,022 | 102 | 1,860 | 94 | 1,904 | 96 |
| | Spain | 16,878 | 363 | 13,203 | 284 | 9,990 | 215 | 8,390 | 181 | 3,159 | 68 | (a) | (a) |
| (RU) | Switzerland | 737 | 91 | 814 | 100 | 892 | 110 | 900 | 111 | 874 | 107 | 951 | 117 |
| (UAS) | Switzerland | 566 | 70 | 565 | 69 | 528 | 65 | 584 | 72 | 617 | 76 | 734 | 90 |
| | UK | 17,735 | 278 | 14,265 | 224 | 12,045 | 189 | 11,960 | 188 | 11,970 | 188 | (a) | (a) |

**Denmark**: Master studies in Informatics are not offered by Universities of Applied Sciences (*Professionshøjskoler*).

**Estonia**: Universities of Applied Sciences (*Rakenduskõrgkoolid*) do not offer Master studies in Informatics.

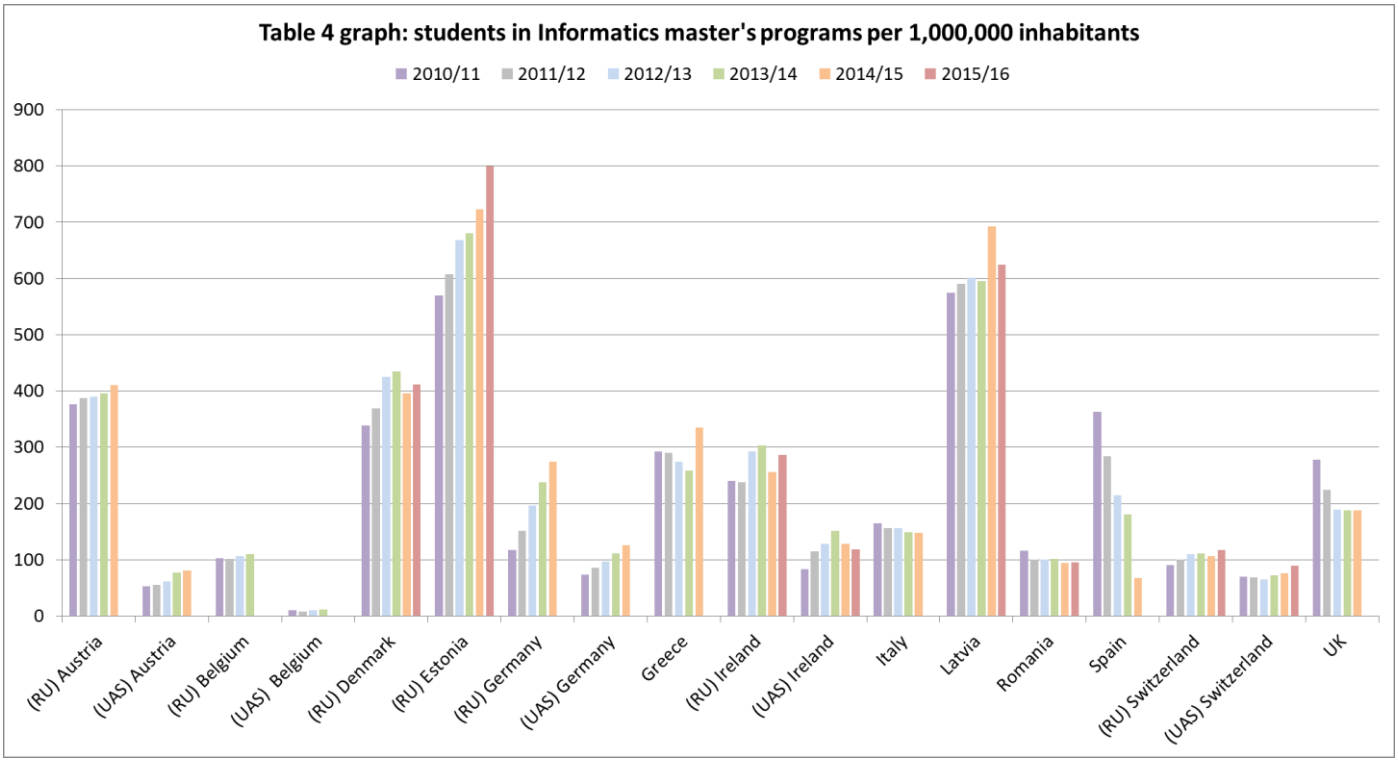
**Netherlands**: separate numbers for enrollments in the distinct levels (bachelor, master, doctorate) are not available: see table 3 for the aggregated total.

**Spain**: in the previous report only numbers for the five-year degree pre-Bologna *"Ingeniería en Informàtica"* corresponding to an integrated Master degree were included (this degree is now discontinued[11]). This year our contacts in Spain collected the data for the master's degrees according to the Bologna model[11]. The very strong decline in the number of master students in the past six years could be explained partly by a genuine effect of a higher job market demand, Bachelor graduates being employed immediately after finishing a higher education first cycle. However, the decline is particularly outstanding and will require a more careful analysis of the data collection process to assure no wrong assumptions or miscalculations crept in. This extra detailed analysis could not be done in time for this year publication, we plan to have it for the next edition.

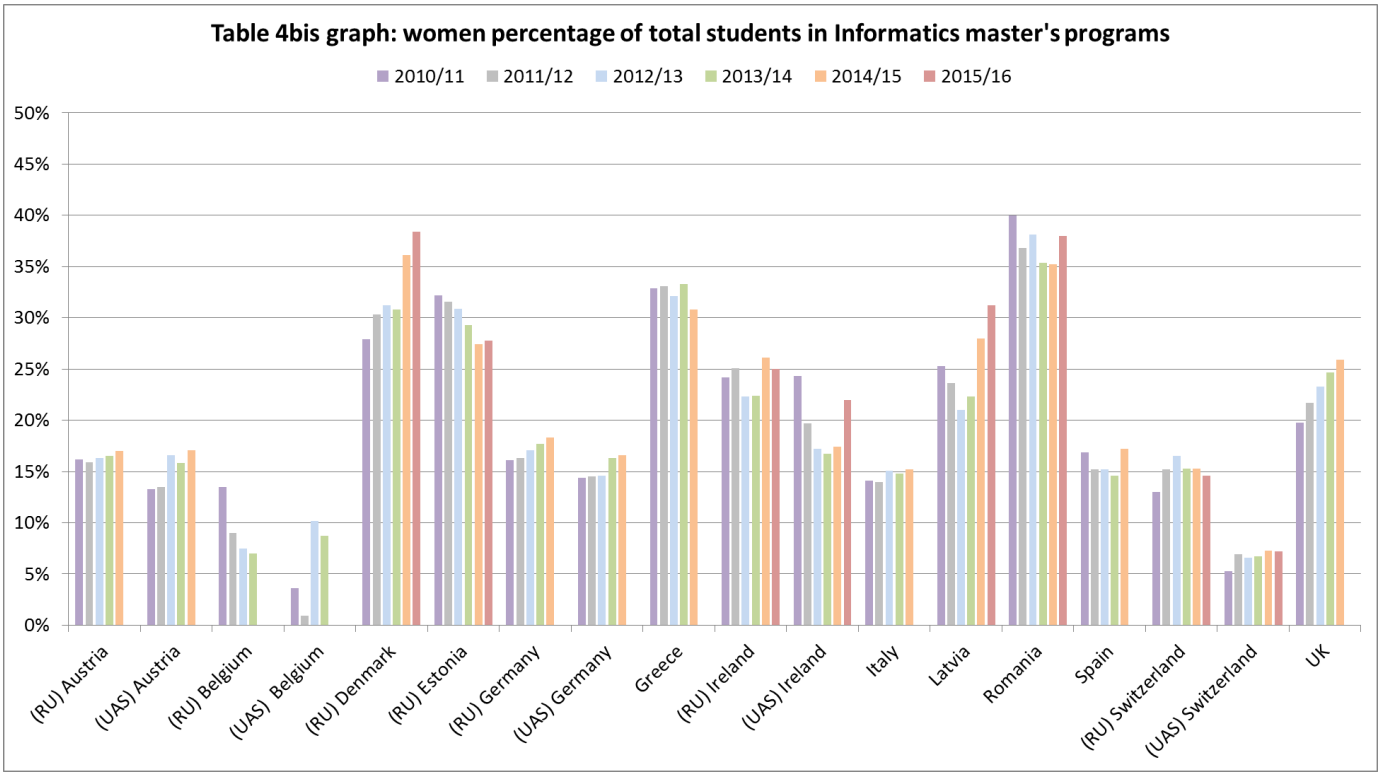
**Switzerland UAS**: studies aiming at Master degree [SW5] in Universities of Applied Sciences (*Fachhochschulen*) in the following program: Engineering *Technik* und IT [SW5-SW6]. Note that the Bachelor studies reported aimed at degrees in different programs (i.e. Informatics, Information Technology and Medical Informatics). Engineering *Technik und IT* was the only program related to Informatics at Master level in Universities of Applied Sciences in Switzerland [SW5-SW6].

[11] Núria Castell Ariño, personal communication.

No hasty conclusion should be drawn from the rapid growth of master's student registrations in Germany and (less pronouncedly) Switzerland, since the transition from the older system based on the "*Diplom*", a five-year degree, to the "Bologna" bachelor-master setup (3 + 2) was still in progress, during the period considered. Part of the growth is clearly genuine, but some of it simply reflects the growing inclusion, as years go by, of students who previously would have been in the last two years of a "*Diplom*" and hence not counted in the master's statistics, even though their concrete course of study would have been essentially the same. We have not attempted to determine the respective part of these two forms of growth, genuine and Bologna-induced.



| *Table 4bis. Women percentage of total students in Informatics master's programs* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 |
| (RU) | Austria | 16.2 | 15.9 | 16.3 | 16.5 | 17.0 | (a) |
| (UAS) | Austria | 13.3 | 13.5 | 16.6 | 15.8 | 17.1 | (a) |
| (RU) | Belgium | 13.5 | 9.0 | 7.5 | 7.0 | (a) | (a) |
| (UAS) | Belgium | 3.6 | 0.9 | 10.2 | 8.7 | (a) | (a) |
| (RU) | Denmark | 27.9 | 30.3 | 31.2 | 30.8 | *36.1* | *38.4* |
| (RU) | Estonia | 32.2 | 31.6 | 30.9 | 29.3 | 27.4 | 27.8 |
| (RU) | Germany | 16.1 | 16.3 | 17.1 | 17.7 | 18.3 | (a) |
| (UAS) | Germany | 14.4 | 14.5 | 14.6 | 16.3 | 16.6 | (a) |
| | Greece | 32.9 | 33.1 | 32.1 | 33.3 | 30.8 | (a) |
| (RU) | Ireland | 24.2 | 25.1 | 22.3 | 22.4 | 26.1 | 25.0 |
| (UAS) | Ireland | 24.3 | 19.7 | 17.2 | 16.7 | 17.4 | 22.0 |
| | Italy | 14.1 | 14.0 | 15.1 | 14.8 | 15.2 | (a) |
| | Latvia | 25.3 | 23.6 | 21.0 | 22.3 | 28.0 | 31.2 |
| | Romania | 40.0 | 36.8 | 38.1 | 35.4 | 35.2 | 38.0 |
| | Spain | 16.9 | 15.2 | 15.2 | 14.6 | 17.2 | (a) |
| (RU) | Switzerland | 13.0 | 15.2 | 16.5 | 15.3 | 15.3 | 14.6 |
| (UAS) | Switzerland | 5.3 | 6.9 | 6.6 | 6.7 | 7.3 | 7.2 |
| | UK | 19.8 | 21.7 | 23.3 | 24.7 | 25.9 | (a) |



## 5.4 Tentative extrapolation to the whole of Europe

It is possible to attempt a rough estimate of how the preceding measurements generalize to Europe as a whole, defined here as the member countries of the Council of Europe. The population of the countries used for this study (see Section 5) is around 46% the population of Europe (considered 340,691,153 inhabitants out of 742,452,000). A simple rule of thirds gives the following approximation (rounded) for the data from 2013/2014:

- First-year students in Informatics: 274,000
- Bachelor students in Informatics[12]: 886,000
- Master students in Informatics[12]: 178,000

Unlike the carefully documented measurements of the preceding tables, these numbers cannot be taken as exhibiting any degree of precision. They do, however, suggest an order of magnitude. If they are indeed within range, we note that more Europeans are in an Informatics bachelor program than live in Marseille, the second most populated city in France, or Frankfurt, the fifth most populated city in Germany.

[12] Note that for the total number of bachelor and master students the extrapolation did not include the Netherlands since separate numbers for enrollments at bachelor and master levels were not available (see table 3 and 4)

# 6 Degrees

The tables that follow present data about degrees awarded: bachelor in tables 5 and 5bis; master in tables 6 and 6bis; doctorate (PhD) in tables 7 and 7bis. Source and footnotes are the same as tables 2 and table 3. Additional footnotes following each table provide detail for specific situations in some countries. Also as before, any comparison must take into account the different definitions of the countries investigated.

## 6.1 Bachelor's degrees

***Table 5. Informatics bachelor's degrees awarded*** ***(Ratio = Total/1,000,000 inhabitants)***

| | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Ratio** | **Total** | **Ratio** | **Total** | **Ratio** | **Total** | **Ratio** | **Total** | **Ratio** | **Total** | **Ratio** |
| **(RU)** | **Austria** | 561 | 66 | 509 | 60 | 521 | 61 | 544 | 64 | 512 | 60 | (a) | (a) |
| **(UAS)** | **Austria** | 326 | 38 | 295 | 35 | 313 | 37 | 295 | 35 | 320 | 38 | (a) | (a) |
| **(RU)** | **Belgium** | 231 | 21 | 274 | 24 | 223 | 20 | 209 | 19 | (a) | (a) | (a) | (a) |
| **(UAS)** | **Belgium** | 1,487 | 132 | 1,518 | 135 | 1,436 | 127 | 1.384 | 123 | (a) | (a) | (a) | (a) |
| **(RU)** | **Denmark** | 273 | 49 | 327 | 58 | 312 | 55 | 378 | 67 | 515 | 92 | 578 | 103 |
| **(UAS)** | **Denmark** | 0 | 0 | 89 | 16 | 51 | 8 | *126* | 22 | 108 | 19 | (a) | (a) |
| **(RU)** | **Estonia** | 226 | 172 | 233 | 177 | 219 | 167 | 225 | 171 | 247 | 188 | (a) | (a) |
| **(UAS)** | **Estonia** | 187 | 142 | 180 | 137 | 173 | 132 | 146 | 111 | 172 | 131 | (a) | (a) |
| **(RU)** | **Germany** | 6,764 | 84 | 6,688 | 83 | 6,640 | 82 | 6,203 | 77 | 6,107 | 76 | (a) | (a) |
| **(UAS)** | **Germany** | 9,112 | 113 | 8,911 | 110 | 8,927 | 111 | 8,970 | 111 | 9,490 | 118 | (a) | (a) |
| | **Greece** | 1,996 | 185 | 1,937 | 179 | 2,254 | 208 | 2,187 | 202 | (a) | (a) | (a) | (a) |
| **(RU)** | **Ireland** | 428 | 93 | 487 | 106 | 375 | 82 | 515 | 112 | 537 | 117 | 646 | 141 |
| **(UAS)** | **Ireland** | 532 | 116 | 713 | 155 | 543 | 118 | 711 | 155 | 728 | 159 | 868 | 189 |
| | **Italy** | 9,221 | 152 | 8,615 | 142 | 8,352 | 137 | 8,166 | 134 | 8,278 | 136 | (a) | (a) |
| | **Latvia** | 654 | 327 | 686 | 343 | 705 | 352 | 656 | 328 | 557 | 278 | 560 | 280 |
| **(RU)** | **Netherlands** | 544 | 32 | 591 | 35 | 676 | 40 | 602 | 36 | 694 | 41 | (a) | (a) |
| **(UAS)** | **Netherlands** | 3,303 | 196 | 3,035 | 180 | 3,318 | 197 | 3,200 | 190 | 3,379 | 201 | (a) | (a) |
| | **Romania** | 1,450 | 73 | 1,235 | 62 | 1,206 | 61 | 1,292 | 65 | 1,423 | 72 | (a) | (a) |
| | **Spain** | 3,909 | 84 | 4,551 | 98 | 4,360 | 94 | 4,796 | 103 | 3,474 | 75 | (a) | (a) |
| **(RU)** | **Switzerland** | 187 | 23 | 179 | 22 | 200 | 25 | 202 | 25 | 226 | 28 | 241 | 30 |
| **(UAS)** | **Switzerland** | 432 | 53 | 427 | 52 | 437 | 54 | 482 | 59 | 452 | 56 | 473 | 58 |
| | **UK** | 17,320 | 272 | 18,010 | 283 | 17,865 | 280 | 17,835 | 280 | 17,445 | 274 | (a) | (a) |

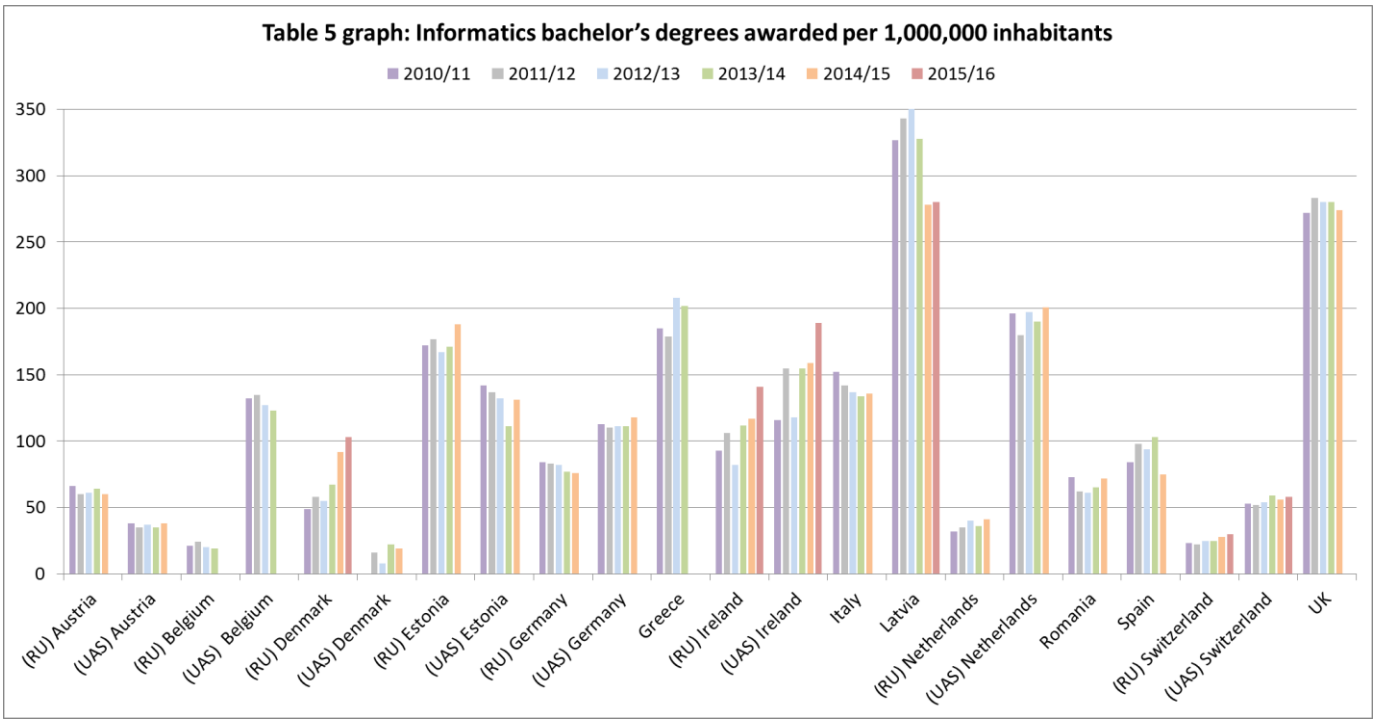
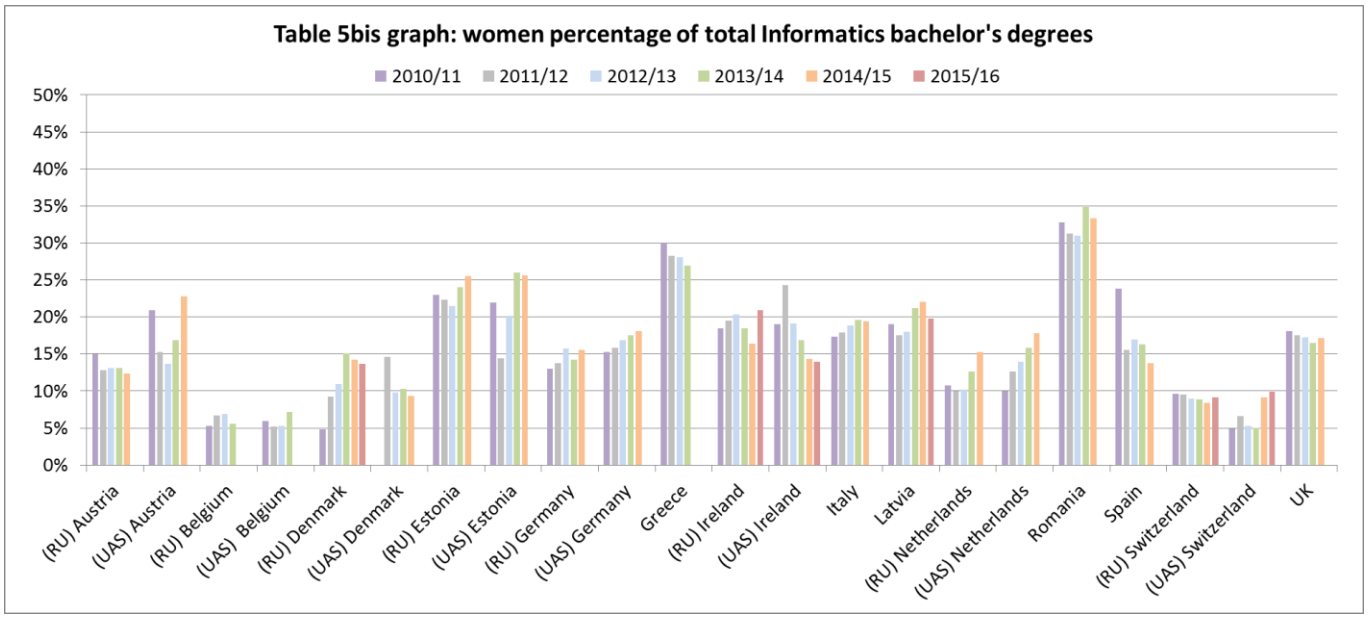


Table 5 graph: Informatics bachelor's degrees awarded per 1,000,000 inhabitants
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
350
300
250
200
150
100
50
0
(RU) Austria
(UAS) Austria
(RU) Belgium
(UAS) Belgium
(RU) Denmark
(UAS) Denmark
(RU) Estonia
(UAS) Estonia
(RU) Germany
(UAS) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
Latvia
(RU) Netherlands
(UAS) Netherlands
Romania
Spain
(RU) Switzerland
(UAS) Switzerland
UK

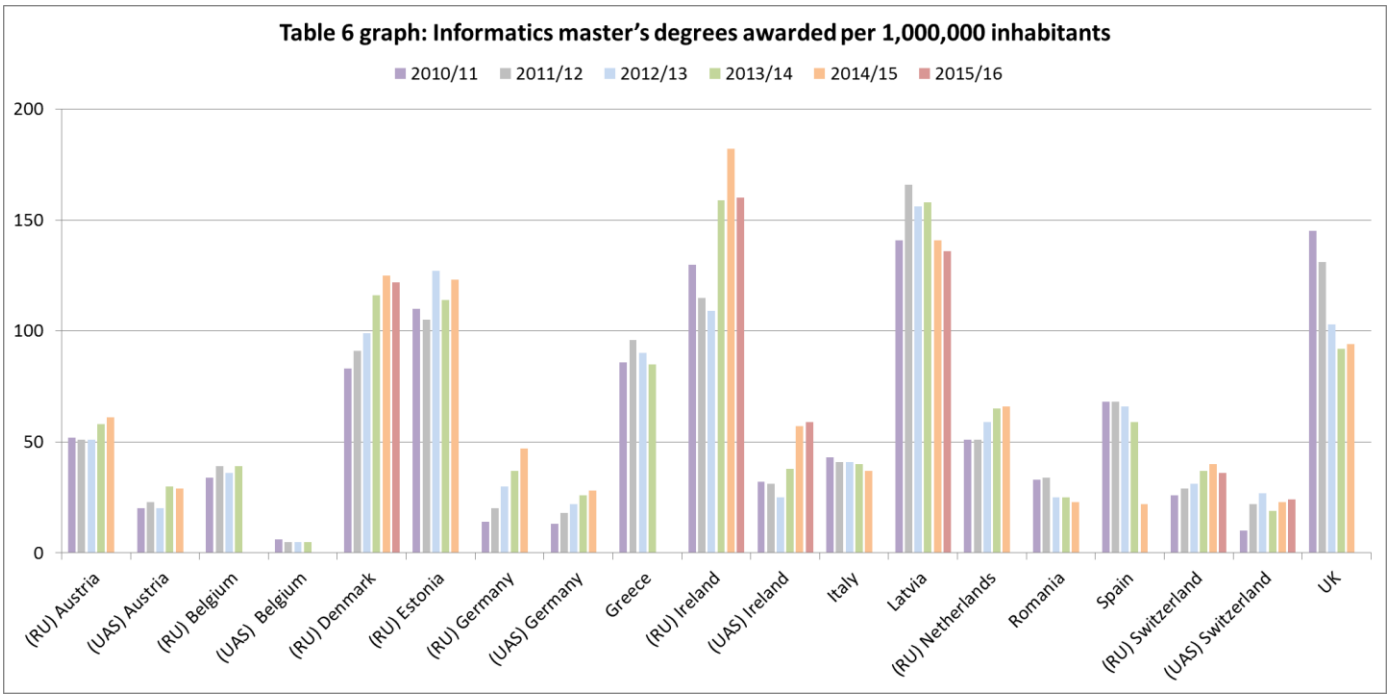
| *Table 5bis. Women percentage of total Informatics bachelor's degrees awarded* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 |
| (RU) | Austria | 15.0 | 12.8 | 13.1 | 13.1 | 12.3 | (a) |
| (UAS) | Austria | 20.9 | 15.3 | 13.7 | 16.9 | 22.8 | (a) |
| (RU) | Belgium | 5.3 | 6.7 | 6.9 | 5.6 | (a) | (a) |
| (UAS) | Belgium | 5.9 | 5.2 | 5.3 | 7.2 | (a) | (a) |
| (RU) | Denmark | 4.8 | 9.2 | 10.9 | 15.1 | *14.2* | 13.7 |
| (UAS) | Denmark | 0 | 14.6 | 9.8 | *10.3* | 9.3 | (a) |
| (RU) | Estonia | 23.0 | 22.3 | 21.5 | 24.0 | 25.5 | (a) |
| (UAS) | Estonia | 21.9 | 14.4 | 20.2 | 26.0 | 25.6 | (a) |
| (RU) | Germany | 13.0 | 13.8 | 15.7 | 14.2 | 15.5 | (a) |
| (UAS) | Germany | 15.3 | 15.8 | 16.9 | 17.5 | 18.1 | (a) |
| | Greece | 30.0 | 28.3 | 28.1 | 26.9 | (a) | (a) |
| (RU) | Ireland | 18.5 | 19.5 | 20.3 | 18.5 | 16.4 | 20.9 |
| (UAS) | Ireland | 19.0 | 24.3 | 19.1 | 16.9 | 14.3 | 13.9 |
| | Italy | 17.3 | 17.9 | 18.8 | 19.6 | 19.4 | (a) |
| | Latvia | 19.0 | 17.5 | 18.0 | 21.2 | 22.0 | 19.8 |
| (RU) | Netherlands | 10.7 | 10.0 | 10.2 | 12.6 | 15.3 | (a) |
| (UAS) | Netherlands | 10.0 | 12.6 | 13.9 | 15.8 | 17.8 | (a) |
| | Romania | 32.8 | 31.3 | 31.0 | 34.8 | 33.3 | (a) |
| | Spain | 23.8 | 15.5 | 17.0 | 16.3 | 13.8 | (a) |
| (RU) | Switzerland | 9.6 | 9.5 | 9.0 | 8.9 | 8.4 | 9.1 |
| (UAS) | Switzerland | 4.9 | 6.6 | 5.3 | 5.0 | 9.1 | 9.9 |
| | UK | 18.1 | 17.5 | 17.2 | 16.5 | 17.1 | (a) |



## 6.2 Master's degrees

| *Table 6. Informatics master's degrees awarded* | | | | | | | | | | | | | *(Ratio = Total/1,000,000 inhabitants)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | |
| | | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio |
| (RU) | Austria | 446 | 52 | 430 | 51 | 434 | 51 | 493 | 58 | 519 | 61 | (a) | (a) |
| (UAS) | Austria | 168 | 20 | 194 | 23 | 169 | 20 | 252 | 30 | 243 | 29 | (a) | (a) |
| (RU) | Belgium | 387 | 34 | 444 | 39 | 410 | 36 | 438 | 39 | (a) | (a) | (a) | (a) |
| (UAS) | Belgium | 72 | 6 | 51 | 5 | 60 | 5 | 58 | 5 | (a) | (a) | (a) | (a) |
| (RU) | Denmark | 469 | 83 | 510 | 91 | 556 | 99 | *653* | *116* | *702* | *125* | *689* | *122* |
| (RU) | Estonia | 144 | 110 | 138 | 105 | 167 | 127 | 150 | 114 | 161 | 123 | (a) | (a) |
| (RU) | Germany | 1,142 | 14 | 1,632 | 20 | 2,407 | 30 | 3,003 | 37 | 3,764 | 47 | (a) | (a) |
| (UAS) | Germany | 1,056 | 13 | 1,455 | 18 | 1,736 | 22 | 2,113 | 26 | 2,227 | 28 | (a) | (a) |
| | Greece | 925 | 86 | 1,033 | 96 | 975 | 90 | 916 | 85 | (a) | (a) | (a) | (a) |
| (RU) | Ireland | 595 | 130 | 529 | 115 | *500* | *109* | 728 | 159 | 837 | 182 | 734 | 160 |
| (UAS) | Ireland | 149 | 32 | 141 | 31 | 114 | 25 | 173 | 38 | 260 | 57 | 273 | 59 |
| | Italy | 2,618 | 43 | 2,519 | 41 | 2,520 | 41 | 2,445 | 40 | 2,270 | 37 | (a) | (a) |
| | Latvia | 282 | 141 | 332 | 166 | 313 | 156 | 316 | 158 | 283 | 141 | 272 | 136 |
| (RU) | Netherlands | 858 | 51 | 852 | 51 | 993 | 59 | 1,087 | 65 | 1,115 | 66 | (a) | (a) |
| | Romania | 659 | 33 | 676 | 34 | 487 | 25 | 505 | 25 | 460 | 23 | (a) | (a) |
| | Spain | 3,179 | 68 | 3,155 | 68 | 3,056 | 66 | 2,727 | 59 | 1,008 | 22 | (a) | (a) |
| (RU) | Switzerland | 215 | 26 | 239 | 29 | 254 | 31 | 300 | 37 | 323 | 40 | 290 | 36 |
| (UAS) | Switzerland | 79 | 10 | 178 | 22 | 216 | 27 | 158 | 19 | 188 | 23 | 199 | 24 |
| | UK | 9,225 | 145 | 8,345 | 131 | 6,590 | 103 | 5,875 | 92 | 6,000 | 94 | (a) | (a) |

**Spain**: in the previous report only numbers for the five-year degree pre-Bologna *"Ingeniería en Informàtica"* corresponding to an integrated Master degree were included (this degree is now discontinued[11]). This year our contacts in Spain collected the data for the master's degrees according to the Bologna model. As mentioned before regarding the number of enrolled students (Section 5.3.), a more careful analysis of the data collection process for the Master data will be required to assure there were no wrong assumptions or miscalculations. This extra detailed analysis could not be done in time for this year publication, we plan to have it for the next edition.




| *Table 6bis. Women percentage of total Informatics master's degrees awarded* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010/11** | **2011/12** | **2012/13** | **2013/14** | **2014/15** | **2015/16** |
| **(RU)** | **Austria** | 11.4 | 15.6 | 13.4 | 17.4 | 16.2 | (a) |
| **(UAS)** | **Austria** | 12.5 | 14.9 | 14.2 | 17.5 | 17.3 | (a) |
| **(RU)** | **Belgium** | 8.0 | 6.1 | 8.6 | 9.0 | (a) | (a) |
| **(UAS)** | **Belgium** | 1.7 | 8.3 | 11.8 | 1.4 | (a) | (a) |
| **(RU)** | **Denmark** | 19.7 | 26.5 | 32.5 | *34.0* | *44.7* | *36.4* |
| **(RU)** | **Estonia** | 34.7 | 25.4 | 31.7 | 36.7 | 32.9 | (a) |
| **(RU)** | **Germany** | 19.0 | 15.7 | 15.5 | 15.8 | 16.8 | (a) |
| **(UAS)** | **Germany** | 15.8 | 12.8 | 14.4 | 13.3 | 14.8 | (a) |
| | **Greece** | 36.9 | 41.2 | 34.6 | 34.1 | (a) | (a) |
| **(RU)** | **Ireland** | 26.7 | 26.1 | 21.3 | 26.7 | 22.7 | 28.2 |
| **(UAS)** | **Ireland** | 21.5 | *26.9* | *25.6* | 19.1 | 18.5 | 17.6 |
| | **Italy** | 15.4 | 13.4 | 15.4 | 14.8 | 14.4 | (a) |
| | **Latvia** | 28.7 | 29.8 | 24.1 | 24.0 | 22.3 | 26.1 |
| **(RU)** | **Netherlands** | 14.6 | 15.8 | 15.8 | 21.6 | 21.8 | (a) |
| | **Romania** | 41.9 | 37.0 | 39.6 | 40.4 | 41.7 | (a) |
| | **Spain** | 19.7 | 16.9 | 16.3 | 14.7 | 15.2 | (a) |
| **(RU)** | **Switzerland** | 11.2 | 14.2 | 12.6 | 15.0 | 14.9 | 15.5 |
| **(UAS)** | **Switzerland** | 0.0 | 3.9 | 6.5 | 6.3 | 6.4 | 7.5 |
| | **UK** | 23.4 | 21.6 | 24.4 | 25.5 | 26.8 | (a) |

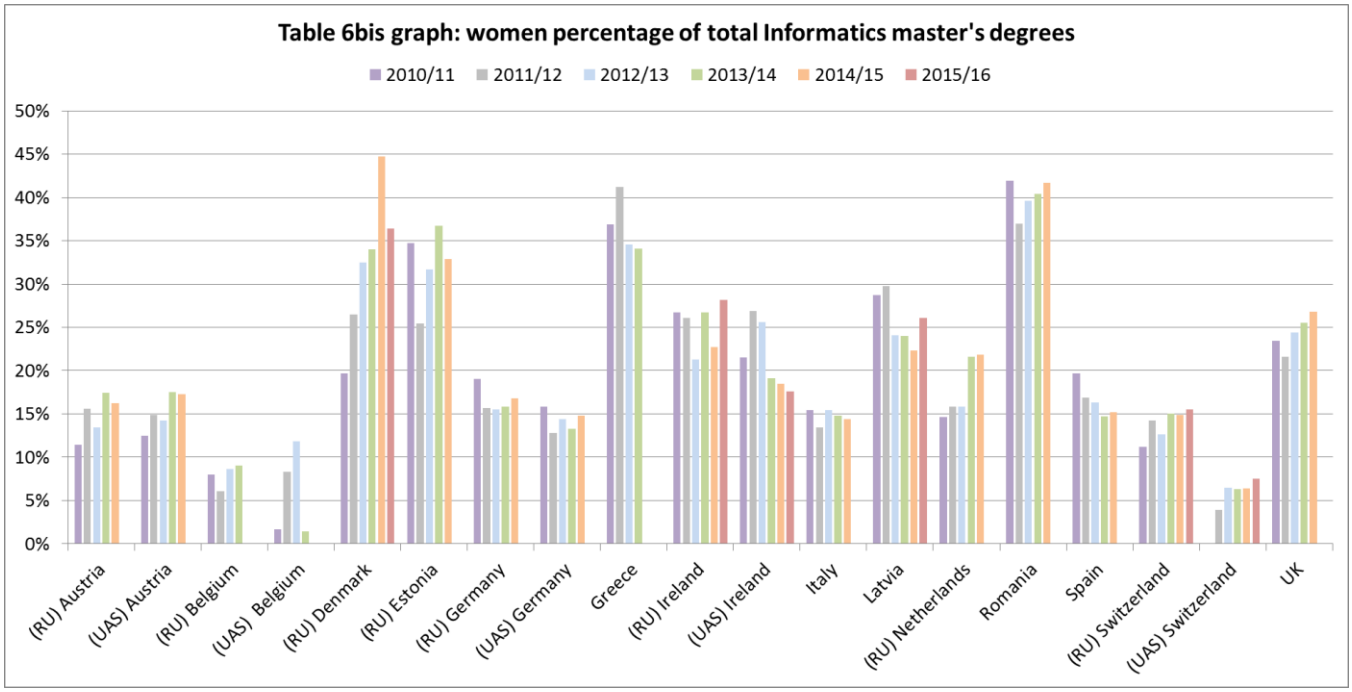


Table 6bis graph: women percentage of total Informatics master's degrees
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
(RU) Austria
(UAS) Austria
(RU) Belgium
(UAS) Belgium
(RU) Denmark
(RU) Estonia
(RU) Germany
(UAS) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
Latvia
(RU) Netherlands
Romania
Spain
(RU) Switzerland
(UAS) Switzerland
UK

## 6.3 Doctoral degrees

| *Table 7. Informatics doctoral (PhD) degrees awarded* | | | | | | | | | | | | *(Ratio = Total/1,000,000 inhabitants)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | |
| | | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio | Total | Ratio |
| (RU) | Austria | 95 | 11 | 139 | 16 | 109 | 13 | 107 | 13 | 112 | 13 | (a) | (a) |
| (RU) | Estonia | 13 | 10 | 14 | 11 | 13 | 10 | 9 | 7 | 16 | 12 | (a) | (a) |
| (RU) | Germany | 832 | 10 | 902 | 11 | 885 | 11 | 941 | 12 | 994 | 12 | (a) | (a) |
| | Greece | 219 | 20 | 175 | 16 | 178 | 16 | 158 | 15 | (a) | (a) | (a) | (a) |
| (RU) | Ireland | 68 | 15 | 59 | 13 | 69 | 15 | 95 | 21 | 80 | 17 | 84 | 18 |
| (UAS) | Ireland | 3 | 1 | 24 | 5 | 7 | 2 | 11 | 2 | 5 | 1 | 2 | 0 |
| | Italy | 500 | 8 | 547 | 9 | 471 | 8 | 485 | 8 | 533 | 9 | (a) | (a) |
| | Latvia | 8 | 4 | 14 | 7 | 24 | 12 | 25 | 12 | 20 | 10 | 16 | 8 |
| | Romania | 33 | 2 | 48 | 2 | 55 | 3 | 40 | 2 | 26 | 1 | (a) | (a) |
| (RU) | Switzerland | 100 | 12 | 96 | 12 | 137 | 17 | 83 | 10 | 116 | 14 | 122 | 19 |
| | UK | 870 | 14 | 900 | 14 | 925 | 15 | 745 | 12 | 910 | 14 | (a) | (a) |

**Belgium:** numbers were not available since PhD degrees are reported combined across the entire field of Sciences or Engineering [BE3, BE4].

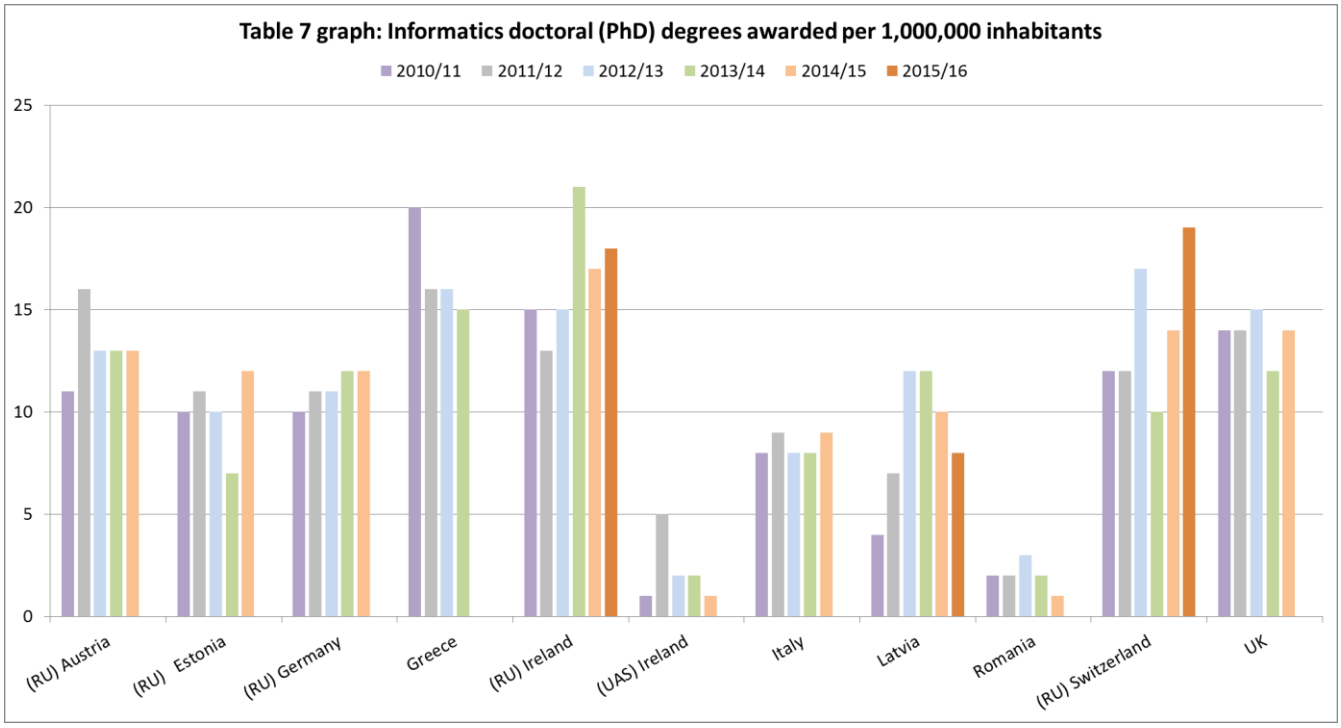
**Denmark**: numbers were not available since PhD degrees are reported combined across the entire field of Natural or Technical Sciences[13].

**Netherlands**: numbers were not available since PhD degrees are reported across the entire field of Engineering or Natural Sciences[10].

**Spain:** PhD degree numbers are collected at higher level, to get information about specific degrees in Informatics and related areas requires a significant effort and investment of time which our partners in Spain could not afford this year. We hope to be able to collected and sort this data for the next edition of this report[11].

In all countries included in this study, except Ireland, PhD degrees are only awarded by traditional Universities and not by University of Applied Sciences/University Colleges.

[13] StatBank Denmark, personal communication




| *Table 7bis. Women percentage of total Informatics doctoral (PhD) degrees awarded* | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010/11** | **2011/12** | **2012/13** | **2013/14** | **2014/15** | **2015/16** |
| **(RU)** | **Austria** | 13.7 | 15.1 | 18.3 | 11.2 | 16.1 | (a) |
| **(RU)** | **Estonia** | 30.8 | 14.3 | 7.7 | 0.0 | 31.3 | (a) |
| **(RU)** | **Germany** | 13.6 | 12.6 | 17.9 | 14.1 | 14.9 | (a) |
| | **Greece** | 12.3 | 21.1 | 19.6 | 20.3 | (a) | (a) |
| **(RU)** | **Ireland** | 20.6 | 23.7 | 14.5 | 19.0 | 26.3 | 27.4 |
| **(UAS)** | **Ireland** | 0.0 | 20.8 | 0.0 | 27.3 | 0.0 | 50.0 |
| | **Italy** | 21.4 | 19.4 | 21.9 | 22.9 | 22.5 | (a) |
| | **Latvia** | 25.0 | 50.0 | 16.7 | 24.0 | 30.0 | 25.0 |
| | **Romania** | 36.4 | 39.5 | 32.7 | 32.5 | 7.7 | (a) |
| **(RU)** | **Switzerland** | 10.0 | 17.7 | 8.8 | 12.0 | 17.2 | 15.6 |
| | **UK** | 21.8 | 22.8 | 22.3 | 22.2 | 20.3 | (a) |

Note that the significant variations in the female percentage of PhD degrees awarded in University of Applied Sciences in Ireland and for Estonia, and in Universities in Latvia and Romania can be better understood considering that the number of PhD degrees awarded in all cases are quite small and therefore small variations in the absolute numbers reflects on a strong variation in the percentages.

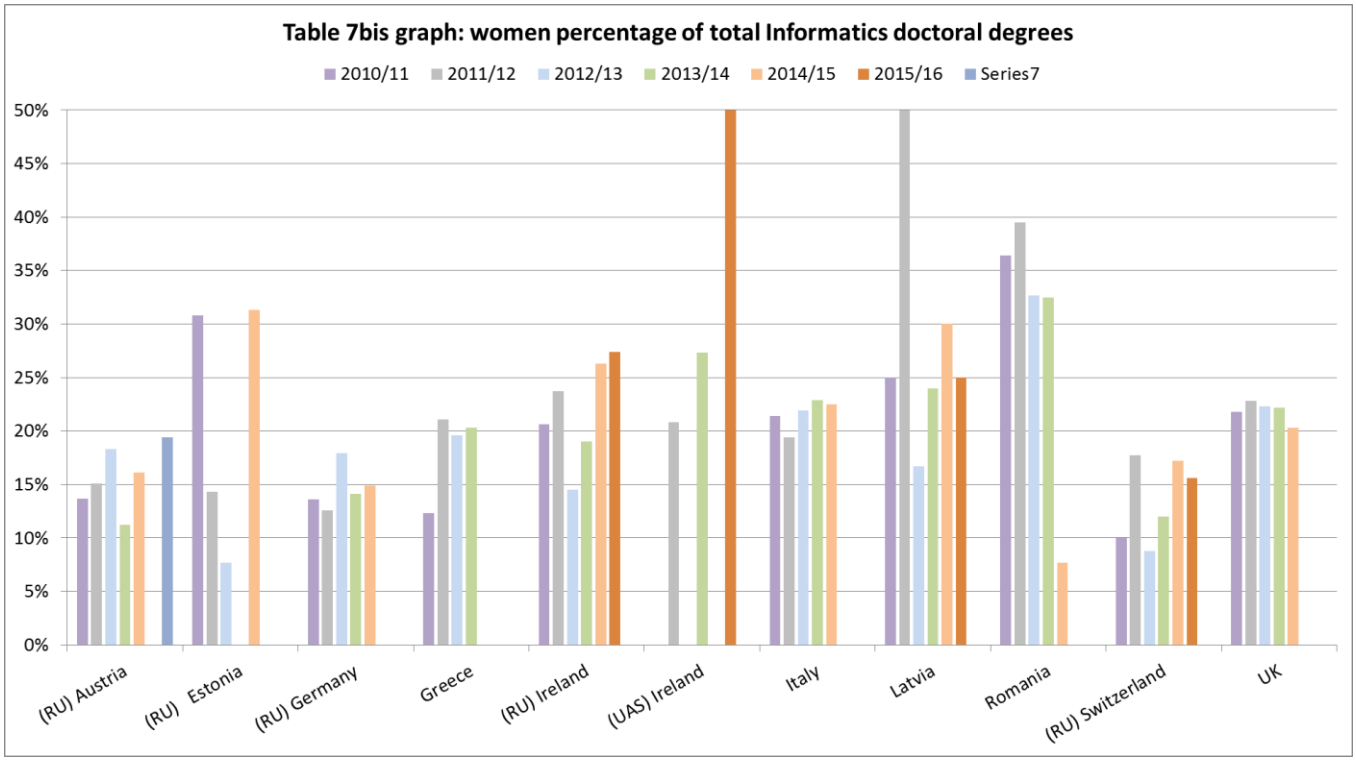


Table 7bis graph: women percentage of total Informatics doctoral degrees
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
Series7
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
(RU) Austria
(RU) Estonia
(RU) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
Latvia
Romania
(RU) Switzerland
UK

## 6.4 Ratio Bachelor graduates/new students

Table 8 and graph 8 show the correlation between the number of students starting their studies (Table 2, Section 5.1) and the number of students successfully concluding their studies (Table 5, Section 6.1) in Informatics Bachelor programs in the countries included in this report.

*Table 8. Ratio between the number of graduates and the number of new students in Informatics Bachelor programs*

| | 2010/11 | 2011/12 | 2012/13 | 2013/14 | 2014/15 | 2015/16 |
|---|---|---|---|---|---|---|
| (RU) Austria | 0.26 | 0.26 | 0.27 | 0.25 | 0.22 | (a) |
| (UAS) Austria | 0.66 | 0.59 | 0.59 | 0.57 | 0.63 | (a) |
| (RU) Belgium | 0.54 | 0.59 | 0.44 | 0.42 | (a) | (a) |
| (UAS) Belgium | 0.46 | 0.47 | 0.40 | 0.36 | (a) | (a) |
| (RU) Denmark | 0.35 | 0.34 | 0.29 | 0.34 | 0.43 | 0.54 |
| (UAS) Denmark | - | 0.68 | 0.38 | 0.75 | 0.70 | (a) |
| (RU) Estonia | 0.37 | 0.37 | 0.28 | 0.33 | 0.41 | (a) |
| (UAS) Estonia | 0.38 | 0.35 | 0.35 | 0.35 | 0.51 | (a) |
| (RU) Germany | 0.55 | 0.41 | 0.40 | 0.34 | 0.30 | (a) |
| (UAS) Germany | 0.59 | 0.49 | 0.47 | 0.47 | 0.46 | (a) |
| Greece | 0.62 | 0.57 | 0.63 | 0.50 | (a) | (a) |
| (RU) Ireland | 0.62 | 0.59 | 0.39 | 0.54 | 0.51 | 0.62 |
| (UAS) Ireland | 0.31 | 0.38 | 0.26 | 0.33 | 0.37 | 0.42 |
| Italy | 0.63 | 0.56 | 0.56 | 0.51 | 0.48 | (a) |
| Latvia | 0.40 | 0.40 | 0.37 | 0.36 | 0.32 | 0.31 |
| (RU) Netherlands | 0.56 | 0.58 | 0.62 | 0.44 | 0.47 | (a) |
| (UAS) Netherlands | 0.64 | 0.55 | 0.59 | 0.52 | 0.52 | (a) |
| Romania | 0.58 | 0.52 | 0.48 | 0.48 | 0.48 | (a) |
| Spain | 0.29 | 0.33 | 0.32 | 0.35 | 0.27 | (a) |
| (RU) Switzerland | 0.48 | 0.45 | 0.49 | 0.44 | 0.44 | 0.45 |
| (UAS) Switzerland | 0.67 | 0.64 | 0.59 | 0.59 | 0.55 | 0.53 |
| UK | 0.56 | 0.60 | 0.70 | 0.63 | 0.61 | (a) |

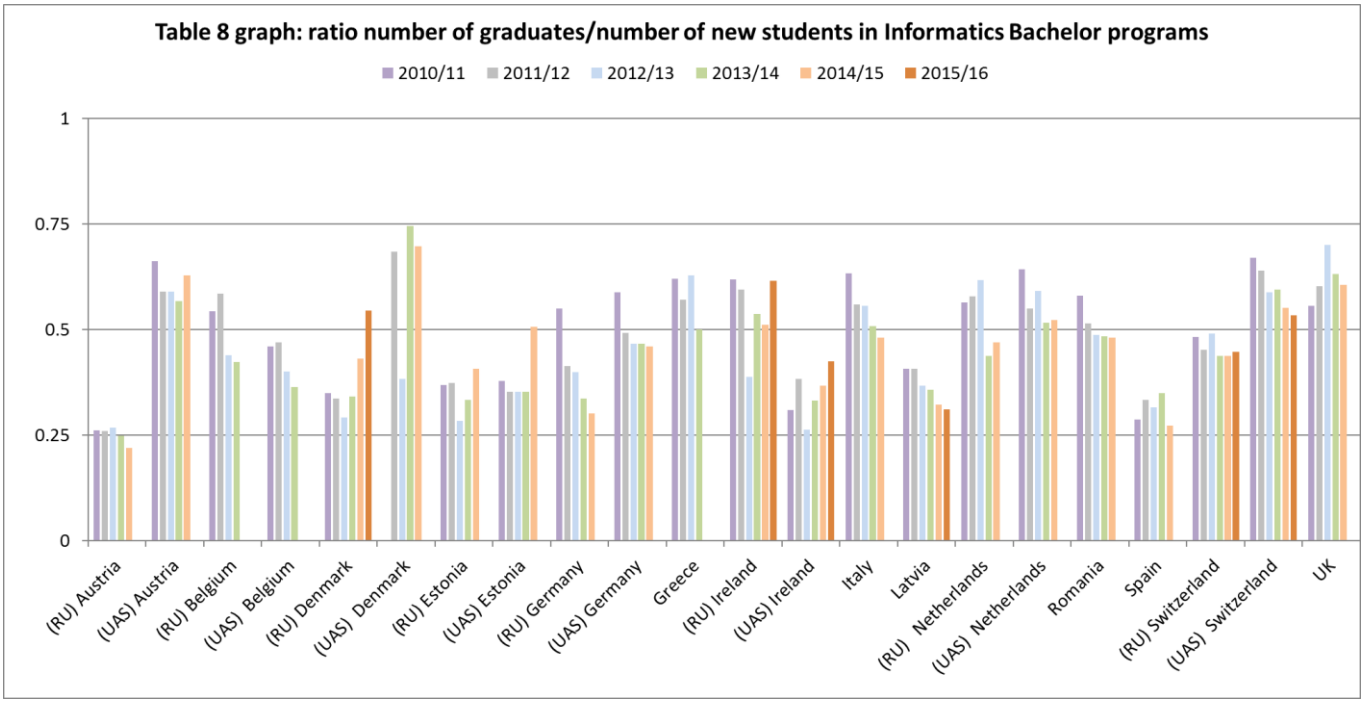


Table 8 graph: ratio number of graduates/number of new students in Informatics Bachelor programs
2010/11
2011/12
2012/13
2013/14
2014/15
2015/16
1
0.75
0.5
0.25
0
(RU) Austria
(UAS) Austria
(RU) Belgium
(UAS) Belgium
(RU) Denmark
(UAS) Denmark
(RU) Estonia
(UAS) Estonia
(RU) Germany
(UAS) Germany
Greece
(RU) Ireland
(UAS) Ireland
Italy
Latvia
(RU) Netherlands
(UAS) Netherlands
Romania
Spain
(RU) Switzerland
(UAS) Switzerland
UK

## 6.5 Tentative extrapolation to the whole of Europe

As discussed in Section 5.4, and with the same qualifications, it is possible from the 2013/2014 data to attempt a rough extrapolation of the Bachelor and Master degrees awarded to all of Europe:

- Bachelor degrees awarded in Informatics: 126,000
- Master degrees awarded in Informatics: 47,000

Unlike the carefully documented measurements of the preceding tables, these numbers cannot be taken as exhibiting any degree of precision. They do, however, suggest an order of magnitude.

## 6.6 Relationship between supply and demand

In light of the preceding figures, it is legitimate to ask how the supply of graduates meets society's demands. EU president Richard Burton declared in a speech [EU3] that:

> *The number of ICT graduates in Europe has decreased from 127,000 in 2006 to 114,000 in 2009 despite the growing pervasiveness of high level ICT occupations across all economies.*

His basis at the time was the preliminary results of an analysis from an EU-commissioned survey ([EU4], pages 119-120). The graduate counts estimated in that survey raise questions; it gives for example a count of 2,420 ICT graduates (bachelor+master) in Italy in 2011, whereas the official Italian government source, as used for the present report [IT2], shows a count of 11,233. Other sources of uncertainty in that survey were recently reported [EU5].

An analysis from the European Commission on European Vacancy and Recruitment includes ICT positions (including IT consultants, IT support staff, software programmers, software developers, data processing technicians, database administrators, IT project leaders) as currently **top bottleneck occupations**, defined as those exhibiting recruitment difficulties across all of Europe [EU6]. The situation is exacerbated by the global war for talent with regard to attract the best skills in the ICT field.

The European Commission estimated that demand for e-skills in Europe in 2012 exceeded the available supply of graduates by around 255,000 [EU4, EU7]. In addition, that by 2015 the gap between demand and supply will grow significantly, to reach (depending on the forecasting scenario) a value of 372,000 to as much as 864,000 [EU4, EU7-EU8].

# 7 Positions and Titles

The present section describes some of the main positions (job titles) available to academics, and corresponding employment details, in the following countries: Austria, Belgium, Estonia, France, Germany, Greece, Italy, Latvia, Netherlands, Romania, Spain, Switzerland and UK.

The information generally applies to academics of all disciplines (not just Informatics) in each country.

Comparing salaries across different countries is complicated by the differences in career systems, career steps and progression. This makes it particularly important to define the different titles available in the countries considered. Section 8 will present the corresponding salary levels in the corresponding countries.

## 7.1 A basis for multinational comparison of academic positions

Tables 8 and 9 show the academic positions whose remuneration is described in Section 8, and the approximate equivalent in the various countries considered. For professor-level positions we used as a reference the nomenclature of the American higher education system: Assistant, Associate and Full Professor, although in many European countries there is not a direct correspondence.

***Table 8. Position correspondence: PhDs and Postdocs***

| | **PhD Candidate** | **Postdoctoral Researcher** |
|---|---|---|
| **Austria** | *Universitätsassistent, Forschungsassistent / Projektassistent (Prädoc)* | *Universitätsassistent, Forschungsassistent / Projektassistent (Postdoc)* |
| **Belgium** | *Doctorant/Assistant*<br>*Doctorandus/Assistent* | *Post-doctorant/Assistant*<br>*Doctor-assistent/ Assistent* |
| **Estonia** | *Doktorant* | *Research Fellows/ Senior Research Fellows/ Research Professors* |
| **France** | *Doctorant* | *Post-doctorant* |
| **Germany** | *Doktorand / Wissenschaftlicher Mitarbeiter* | *Postdoktorand / Wissenschaftlicher Mitarbeiter / Oberassistent / Oberingenieur* |
| **Greece** | *Υποψήφιος Διδάκτορας* | *Μεταδιδάκτορας* |
| **Italy** | *Dottorando* | *Assegnista di Ricerca* |
| **Latvia** | *Doktorants* | - |
| **Netherlands** | *Promovendus* | *Onderzoeker 4 / Docent 4* |
| **Romania** | *Doctorand* | *Cercetator Postdoc / Cercetator / Cercetator Principal* |
| **Spain** | *Doctorando* | *Ayudante Postdoc (1)/ Investigador Postdoc (2)* |
| **Switzerland** | *Doktorand / Wissenschaftlicher Assistenz I* | *Post-Doktorand / Wissenschaftlicher Assistenz II* |
| **UK** | PhD Students/ Postgraduate Research Student | Research Assistant / Research Associate / Research Fellow |

In Austria, Belgium, Germany and Switzerland the term "*Assistent*" (assistant) is used for both PhD Candidates and Postdoctoral Researchers.

| *Table 9. Position correspondence: Professors* | | | | | | |
|---|---|---|---|---|---|---|
| | **Assistant Professor** | | **Associate Professor** | | **Full Professor** | |
| **Austria** | *Assistenzprofessor* | | *Assoziierter Professor / Außerordentlicher Universitätsprofessor* | | *Universitätsprofessor* | |
| **Belgium Wallonia** | *Chargé de Cours* | | *Professeur* | | *Professeur Ordinaire* | |
| **Belgium Flanders** | *Docent* | *Hoofddocent* | | *Hoogleraar* | | *Gewoon Hoogleraar* |
| **Estonia** | *Assistent* | *Lektor* | | *Dotsent* | | *Professor* |
| **France** | *Maître de Conférences* | | | *Professeur des Universités* | | |
| **Germany** | *Juniorprofessor* | | *Außerordentlicher Professor* | | *Ordentlicher Professor* | |
| **Greece** | *Λέκτορας* | *Επίκουρος Καθηγητής* | | *Αναπληρωτής Καθηγητής* | | *Καθηγητής* |
| **Italy** | *Ricercatore a Tempo Determinato Tipo A/Tipo B* | | *Professore di Seconda Fascia (Professore Associato)* | | *Professore di Prima Fascia (Professore Ordinario)* | |
| **Latvia** | *Asistents* | *Lektors* | *Docents* | *Asociēts Profesors* | *Profesors* | |
| **Netherlands** | *Universitair Docent 2* | *Universitair Docent 1* | *Universitair Hoofddocent 2* | *Universitair Hoofddocent 1* | *Hoogleraar 2* | *Hoogleraar 1* |
| **Romania** | *Asistent* | *Lector* | | *Conferentiar* | | *Profesor* |
| **Spain** | *Titular de Escuela Universitaria* | | *Titular de Universidad / Catedrático de Escuela Universitaria* | | *Catedrático de Universidad* | |
| **Switzerland**[14] | *Assistenzprofessor* | | *Außerordentliche Professor* | | *Ordentlicher Professor* | |
| **UK** | Lecturer | | Senior Lecturer/Reader | | Professor | |

[14] German terms. French (*Professeurs Assistants*, *Professeurs Associés*, *Professeurs Ordinaries*) and Italian (*Professori Assistenti*, *Professori di Ruolo Straordinari* and *Professori di Ruolo Ordinari*) equivalents are used in the corresponding regions of Switzerland.

## 7.2 Austria

PhD Candidates (so-called *PräDoc-Assistenten*) are typically employed as university assistants (if financed by the University they are called *Universitätsassistent*) or as project assistant (financed by grants, funds or industrial cooperation) at the institute of their academic supervisor. Their employment contracts are usually issued for four years and cannot be extended (in the case of employment as *Universitätsassistent*). However, in case PhD Candidates are employed as project assistant, contract extensions might be possible, depending on their funding source. Their duties include support in teaching, administrative tasks and doing research. PhD Candidates can also be financed by scholarships which are funded by national or local authorities, industry or others. Scholarship holders are on average funded for a period of three years. They do not have any teaching or administrative duties and can focus only on their thesis. Finally, there are also self-funded PhD students, doing their research in parallel to their "normal" work.

For Postdoctoral Researchers (*PostDoc-Assistenten*) a similar system applies. Depending on their funding source they are employed as university assistant (postdoc *Universitätsassistent*) or project assistant. Contracts of postdoc *Universitätsassitenten* are fixed for four up to a maximum of six years and cannot be renewed. The contracts for project assistants may be extended up to 10 or 12 years, depending on their funding source. Funding programs for Postdoctoral Researchers also enable them to apply for funding of their own independent position as part of a grant for a research project.

Professor positions are organized in three categories: Assistant Professor (*Assistenzprofessor*), Associate Professor (*Assoziierter Professor*/*Außerordentlicher Universitätsprofessor)* and Full Professor (*Universitätsprofessor*). Associate Professor and Full Professor positions are permanent. The initial appointment of Assistant Professors (tenure track positions) is for six years with the possibility of promotion to a permanent position as Associate Professor after a positive evaluation. There exists a specific tenure track system for the promotion from an Assistant Professor position to an Associate Professor position (for selected Assistant Professors who obtain the so-called *Habilitation*). However, there is not such a system for the promotion from an Associate Professor position to a Full Professor position. Being appointed as Full Professor requires a specific appointment procedure and in general they have a Chair (*Lehrstuhl*). Since the year 2000 Full Professors are no longer employed as civil servants, but as University employees (the same for Associate Professors and Assistant Professors since 2004).

## 7.3 Belgium

PhD candidates in Belgium can have different types of positions according to the source and type of funding. Working contracts as teaching/research assistants, project assistants (*mandaatassistent*, *wetenschappelijk medewerker*, *mandat d'assistant*) and PhD scholarships (*doctoraatsbeurzen*, *boursier de doctorat*) are available. Assistant positions are temporary, the appointment is initially for two years, this period can be extended two times, lasting therefore a maximum of six years (exceptionally one extra year can be granted). Research/teaching assistants have teaching and administrative duties additionally to the work invested in their thesis. Project assistants work in one research project as part of their PhD training, contracts are usually not longer than four years and usually do not involve administrative duties but they are often asked to take on some teaching duties. PhD scholarships are offered by a number of different agencies and programs, and have usually a duration of four years. PhD students receiving a scholarship are mostly dedicated to work on their thesis and need to prepare a PhD research proposal to compete for the scholarship [BE6-BE8]

Postdoctoral positions have similar arrangements, (teaching/research, project) assistant positions are temporary, contract duration vary from university to university. Postdoctoral fellowships (*postdoctoraal onderzoeker*, *bourses de post-doctorat*) are initially for three years and can be renewed once for another three years [BE8-BE10].

Professor positions are organized differently in Flanders and Wallonia, in Wallonia there are three categories: *Chargé de Cours*, *Professeur* and *Professeur Ordinaire* [BE11] while in Flanders four university professor categories exist: *Docent*, *Hoofddocent*, *Hoogleraar* and *Gewoon Hoogleraar* [BE12].

In Wallonia *Chargé de Cours* and *Professeur* are initially non-tenured positions including an initial temporary appointment of minimum three years, after this initial temporary period, the position can become permanent upon a positive evaluation. The rank of *Professeur Ordinaire* is not available upon appointment, only by internal promotion. Request for promotion from a *Chargé de Cours* to a *Professeur* position is formally possible after eight years. Promotion from *Professeur to Professeur Ordinaire* is formally possible after another five years [BE11].

In Flanders most *Docent* positions, similarly to Assistant Professor, are tenure-track positions, the appointment is initially for five years, a positive assessment at the end of that period grants directly an appointment into a permanent *Hoofddocent* position in the same university [BE8]. New *Hoofddocent* (outside the internal *Docent* tenure-track path), *Hoogleraar* and *Gewoon Hoogleraar* appointments usually include a minimum tree-year temporary period (*integratieperiode*) with a prospect for permanent employment based on a positive evaluation after the initial trial period. Request to promotion to a higher level is usually possible after three years of the last permanent appointment or promotion [BE13, BE14].

## 7.4 Estonia

PhD Candidates in Estonia can be employed as (teaching) assistants, junior researchers or officers (for example project assistants/managers). Their duties include teaching, research and performing administrative tasks. Teaching assistants are financed by the university (teaching finances) and early-stage researchers by universities or by grants. Project assistants are financed by grants and other funds i.e. by research projects they are working on. Employment contracts can be either fixed-term or permanent[15]. State-funded PhD scholarships are also available.

A Postdoctoral Researcher (Research Fellow) is a researcher who has been awarded a doctorate, or equivalent qualification, in Estonia or in a foreign country, no more than five years ago. Postdoctoral Researchers are funded by grants in support of research carried out by them or/and they are employed as research fellows, senior research fellows or research professors. Mobilitas Plus grants (European Research Foundation's finances) are available for foreign postdocs coming to Estonia and research grants funded by the state for Estonian postdocs who are going to foreign countries. Other grants from international fellowship programs are available as well[15].

Professor positions in Estonia are organized in four categories: *Assistant, Lektor, Dotsent* and Professor. Professor and *Dotsent* must hold a doctoral or an equivalent qualification and have at least five years of prior relevant experience. A *Lektor* and an *Assistent* must hold at least a master's degree or an equivalent qualification [EE2, EE3]. Until the end on 2014 all university academic positions were fixed-term and renewed every five years, from 2015 most academic positions have become permanent from the start of the employment contract [EE2, EE3]. In this new system, at every five years employees go through a compulsory attestation review, whose guidelines and parameters are defined in the Estonian Universities Act [EE3]. Internal promotion from *Assistent* to *Lektor* positions is possible after PhD defence, based on a positive performance review and the institute needs and funding. Promotions to *Dotsent* and *Professor* positions are not possible, each new position needs to be filled usually through a new open hiring process[15] [EE2, EE3].

## 7.5 France

The employment of PhD Candidates is defined in France by a "*doctoral contract*" ruled by public law since 2009 [FR2-FR4]. It consists of a fixed-term contract for a minimum period of three years, which may be extended for a maximum of one year (usually in case of special situations such as maternity/paternity leave, long sick or accident leave, etc). The doctoral contract may define a job where only research and work for the thesis completion are involved, or include other tasks such as teaching, scientific and technical information, development of research, consultancies or expertise to companies or public authorities [FR2-FR4]. The base salary is slightly higher in the case of a contract involving

[15] Margit Grauen, personal communication

complementary duties (see below). Salaries paid in research institutes or in projects involving close collaboration with industry can also vary (see below).

Postdoctoral Researchers are employed in fixed-term working contracts (*contrats temporaires de chercheur*) which vary from one to three years, can be extended, but not surpass six years on the total. Funding for postdoctoral positions come from national, European or international funding agencies or projects developed with Industry.

University professors (*Maîtres de Conférences* and *Professeur des Universités)* have permanent, tenured positions including a number of levels (*classes*) [FR2, FR5-FR7]. In the statutory group of *Maîtres de Conférences* there are two levels: *classe normale* and *hors-classe*; in the statutory group of *Professeur des Universités* there are three levels: *deuxième*, *première*, and *classe exceptionnelle* [FR5-FR7]. Promotion to a higher level, in the same category, is not granted automatically for seniority, but involves a performance review process. Promotion from a *Maîtres de Conférences* to a *Professeur des Universités* position, requires the application to a new available position through a specific process called *concours*.

## 7.6 Germany

PhD Candidates in Germany are typically employed as *Wissenschaftlicher Mitarbeiter* (research associate) having a fixed-term contract at the institute of their supervisor. The funding comes from the state, National Science Foundation (DFG), EU, ministries on federal or local level, industry, foundations and other sources. Duties include working on research projects, teaching, organizing seminars or performing administrative tasks [GE6-GE8], depending in part on the source of funding. In general, the working contract is for a period of three years and can be renewed for an additional maximum period of three years. Funding can also be through scholarships provided by DFG, the *Alexander von Humboldt Foundation* and the *Deutsche Akademische Austauschdienst* (*DAAD)* [GE6-GE8]. Scholarships are usually for no more than 3 years.

Postdoctoral Researchers are also employed as *Wissenschaftlicher Mitarbeiter* (or alternative names shown in Table 8) and have fixed-term contracts that cannot be extended for more than six years. At entry level salaries are slightly higher than for PhD positions and depend on experience and family status (see below) [GE8-GE9]. Funding programs for Postdoctoral Researchers also enable them to apply for funding of their own independent position as part of a grant for a research project. The position can be at a University or an independent research institute, which must provide the necessary basic equipment and facilities for the development of the research project [GE8-GE9].

Professor positions are organized in three categories: *Juniorprofessor*, *Außerordentlicher Professor* and *Ordentlicher Professor. Juniorprofessor* positions, introduced by law in 2002, are time-limited (three years), can be renewed once, and provide the opportunity to apply for a permanent position after the sixth year without passing the *Habilitation* process (which junior professors still often do). Academics in these positions, although non-permanent, do not work as research assistants for permanent professors; they have their own research group and work autonomously [GE10]. In general, there is no tenure process (although some universities offer *Juniorprofessor* positions including a tenure-track plan [GE10-GE11]), therefore at the end of his or her term a *Juniorprofessor* must apply for a new open position and go through the usual German recruitment process to reach a tenured professorship. *Außerordentlicher* and *Ordentlicher Professor* are permanent tenured positions. *Außerordentlicher Professor* has teaching duties, his/her own research group and a smaller budget when compared to *Ordentlicher Professors* who have bigger research groups and budgets and in general have a Chair (*Lehrstuhl*) [GE12].

## 7.7 Greece

PhD candidates in Greece are students of doctoral programs. Funding is provided in one of the following forms:

- Fellowships: several research centers and universities provide fellowships to PhD students. They are also provided by the State Scholarships Foundation (IKY) and by other public and private foundations/agencies, like

Onassis Foundation, John S. Latsis Public Benefit Foundation, Bodossaki Foundation, and others (this list is not exhaustive).

- Stipends/grants: the Ministry of Culture, Education and Religious Affairs (and specifically, the General Secretariat for Research and Technology - GSRT) occasionally offers stipends and grants under certain research programs for PhD students (like *Hrakleitos*) co-funded by the European Union (European Social Fund) and National Resources.
- Employment contracts: employment contracts are offered by several research centers and universities for participation in actions funded by the European Commission and other projects funded by national funds. They are also occasionally provided by GSRT under research programs for cooperative research and innovation (like Thales and Archimedes) as well as under European Commission-funded Actions.

PhD students may also get funding through their participation in working teams of collaboration projects between universities and industry[16].

Postdoctoral Researcher positions are becoming more and more common in Greek universities, research and technology centres and institutes. These are fixed term temporary positions dedicated to research (but often involving teaching responsibilities in HEIs). Funding schemes for Postdoctoral Researchers are similar to those mentioned above for PhD candidates[15].

Professor positions in Greece until 2011 were organized in four categories: Lecturer (*Λέκτορας*), Assistant Professor (*Επίκουρος Καθηγητής*), Associate Professor (*Αναπληρωτής Καθηγητής*) and Professor (*Καθηγητής*). From 2011 no new Lecturer positions have been offered and the teaching academic positions were restricted to Assistant Professor (*Επίκουρος Καθηγητής*), Associate Professor (*Αναπληρωτής Καθηγητής*) and Professor (*Καθηγητής*). Professors on all ranks working in public institutions are civil servants, their salaries and career path and promotions are ruled by the national government[16].

Assistant Professor positions are non tenured and have an initial contract of four years which can be extended for another four years. After six years in an Assistant Professor position, application for promotion is possible. If not successful a new request for promotion can be issued after a period of three years. Associate and Professor are permanent tenured positions. After four years in the position, Associate Professors have the right to initiate the procedure for their promotion i.e. the publication of an open call of interest for a Professor position. The main criteria evaluated for promotion are research performance (number and quality of publications), teaching performance and key role in administrative duties. The strictness in the application of the criteria differs from department to department, from university to university and from discipline to discipline [GR2].

The serious economic crisis Greece if facing in recent years is also deeply affecting the universities and the promotion system. Since 2010 there has been no new call for faculty members in the country in any level, a situation which is endangering the national higher education system and worsening the brain drain effect, record number of Greek academics are searching for jobs in other European countries, North America and Asia [GR3, GR4].

## 7.8 Italy

PhD positions in Italy are funded either by national scholarships, through research grants of professors, or through industry funding programs. The contract is normally for three years and salary is fixed, not progressing along the years. Funding for more than three years can in some cases be provided through research grants. PhD Candidates can have teaching and supervision duties additionally to the thesis work, in this cases they earn a slightly higher salary, which depends on the local University rules [IT3,[17]].

[16] Panagiota Fatourou, personal communication
[17] Carlo Ghezzi, personal communication

Postdoctoral Researchers (*Assegnista di Ricerca)* are employed in temporary, fixed-term, working contracts for a minimum of one year (usually two years) that can be renewed for a maximum of two additional years. Their duties include research as well teaching and students' supervision[17].

Professor positions are organized in three categories: *Ricercatore*, *Professore di Seconda Fascia (Professore Associato)* and *Professore di Prima Fascia* (*Professore Ordinario*).

Up to 2010, an Assistant Professor (*Ricercatore*) after three years could be confirmed to a tenured position (*Ricercatore Confermato*), without being promoted to a higher level professorship. This situation changed in 2011 [IT4] when Assistant Professor positions started to have a limited duration (*tempo determinato*). They are of two kinds: *Tipo A* and *Tipo B*. *Ricercatore a Tempo Determinato Tipo A* is initially appointed for three years, the contract can be extended at most once for maximum of two years. *Ricercatore a Tempo Determinato Tipo B* are tenure track positions, the contract lasts at most three years, without further extensions, and can be assigned to candidates who previously had type A contracts (or similar experience nationally or abroad). After three years, type B personnel who received a national habilitation, and had positive evaluation at the end of the three years, are promoted to a tenured Associate Professor (*Professore di 2ª Fascia*) position [IT4,[17]].

*Professore Associati* and *Professore Ordinari* are since 2011 tenured positions from the initial appointment, until 2010 both types of positions were non-tenured in the first three years [IT4,[17]].

## 7.9 Latvia

PhD Candidates in Latvia are students in doctoral programs and usually receive a scholarship. In some cases, they work as researchers in HEI's projects, or in industry.

Postdoctoral Researcher positions do not exist in Latvia. After receiving a doctor degree those following an academic career (on average 50% tends to got to Industry) are immediately eligible to *docents* or even *Asociēts Profesor* positions. To become a *Profesors* (full professor) it is mandatory at least three years of experience in an *Asociēts Profesors* position, on average this tends to be much longer than three years[18].

Academic teaching staff positions in Latvia are organized in five categories: *Asistents*, *Lektors*, D*ocents*, *Asociēts Profesors*, P*rofesors*. There is not a straight correspondence to the positions of Assistant, Associate and Full Professor. *Asistents* and *Lektors* positions typically do not require a doctoral degree, instead a master degree is required. *Docent*s and *Asociēts Profesors* positions typically require a doctoral degree (with rare exceptions for strong professionals from industry, teaching in professional programs). A doctoral degree and at least three years in a *Asociēts Profesors* position is a precondition for being eligible to a *Profesors* position. Additionally, minimal requirements (in teaching, research, organizational work, etc) are defined by the central government for positions of *Asociēts Profesors* and *Profesors* (e.g., at least 5 Web of Science or Scopus-indexed publications and at least 5 presentations at international conferences during the past 6 years). In all five categories, a person is elected through public competition for six years. After six years the position is declared vacant and a new competition takes place, however the person currently holding the position is eligible to apply again; in Latvia academic permanent tenured positions do not exist[18].

## 7.10 The Netherlands

PhD Candidates in the Netherlands are typically employed by the university in the rank of *Promovendus* (PhD Researcher), on a fixed-term contract for three or four years (four years is standard) [NE5-NE7]. PhD positions are funded almost exclusively by projects from external sources like the Netherlands Organization for Scientific Research (NWO), the EU, foreign grants, or industry. PhD Candidates carry out their research under supervision of at least one

[18] Juris Borzovs, personal communication

professor and/or senior member in a research group. Progress is monitored. In addition to their research, PhD Candidates normally have a small task in teaching, supervision, or other project-related activities.

Postdoctoral Researchers at entry level are generally appointed to *Onderzoeker* 4 (Researcher 4) in a temporary, fixed-term contract for up to two years. Postdoctoral Researchers are almost exclusively funded by projects. Depending on the funding, contracts may be renewable, but the total term of the employment, including any subsequent contracts in the same university, should never surpass six years [NE5-NE7].

The other dedicated or special positions for research or teaching in the Dutch system include those of *Docent* (Lecturer) and of *Onderzoeker* (Researcher) and range from *Docent* 4 (Junior Lecturer) up to *Docent* 1 (Coordinating Senior Lecturer) and from *Onderzoeker* 4 (Junior Research Fellow) up to *Onderzoeker* 1 (Coordinating Senior Researcher). The positions are often temporary but can be tenured. The researcher-positions usually require a PhD, and the lecturer-positions usually require (or lead to) a basic certificate as lecturer [NE5-NE7].

The regular (structural) positions in the Dutch system have a mix of research and teaching duties, and senior positions may include various responsibilities for projects, programs and/or groups as well. The regular positions include, in increasing level of seniority: *Universitair Docent* 2 and 1 (UD2/UD1, roughly corresponding to Assistant Professor), *Universitair Hoofddocent* 2 and 1 (UHD2/UHD1, roughly corresponding to Associate Professor), and *Hoogleraar* 2 and 1 (H2/H1, corresponding to full professor). Only full professors hold Chairs. All positions are usually tenured or tenure-track.

## 7.11 Romania

PhD Candidates have a fixed term contract with the university for a period of three years, that can be extended for at most two years; afterwards there exists a ''*grace*'' period of two years. PhD Candidates can receive a doctoral grant, in this case their duties include teaching, research and administrative tasks. Doctoral grants can be funded from the state budget or private funding. PhD candidates are expected to carry out research under the supervision of a professor and an advisory board[19].

Postdoc positions in universities are usually funded from research projects and are temporary, usually for three years (except from large research projects that last longer). The research institutes may also employ postdoctoral researchers in permanent research positions[19].

Professor positions are organized in four categories: *Asistent*, *Lector*, *Conferentiar* and *Profesor*. Professors on all ranks working in public institutions are civil servants, their salaries and career path and promotions are ruled by the national government. *Asistent* are usually temporary positions (typically 3 years) and may be occupied by senior PhD Candidates or Postdoctoral Researchers. All the other positions are permanent and involve both teaching and research activities. The conditions to occupy any academic or research positions are regulated by the National Council for University Titles, Diplomas and Certificates (CNATDCU) [RO1], and may be further restricted by universities. Only professors who obtain the Habilitation title can work as a PhD supervisor[19].

## 7.12 Spain

PhD Candidates in Spain are considered both as trainee researchers and university students. The rights of doctoral students as trainee researchers are found in the bases described by the European Charter for Researchers and within the Code of Conduct for the Recruitment of Researchers, of 2005, endorsed by European universities. The position of trainee researcher is regulated in Spain through the Trainee Research Staff Statute of 2006. PhD candidates have fixed-term full time contracts lasting for one year and subject to renewal up to a maximum of four years (six for disabled students). Positions are funded by national scholarships, research grants of professors, or industry funding programs. The most common situation is national funding through Spanish grants such as FPU (*Formación de*

[19] Simona Motogna, personal communication.

*Profesorado Universitario,* 4 years) or FPI (*Formación de Personal Investigador,* 4 years) or regional grants such as Catalan grants (*FI – Formació d'investigadors*, 3 years). PhD Candidates can have teaching and supervision duties additionally to the thesis work, after the second year [[11], SP2].

Postdoctoral Researchers (*Ayudante Postdoc, Investigador Postdoc*) are employed in temporary, fixed-term, working contracts for a minimum of one year, the contract can be renewed for a maximum of four additional years. Their duties include research as well teaching and students' supervision[11].

Professors with permanent positions in Spain can be employed by the national Spanish Government (civil servants) or by a regional government. Civil servants positions are organized in three categories: *Titular de Escuela Universitaria*, *Titular de Universidad*/*Catedrático de Escuela Universitaria and Catedrático de Universidad*. All positions, starting before 2007, were permanent and tenured. From 2007 an educational reform has been enforced and under new contracts only *Catedrático de Universidad* and *Titular de Universidad are tenured positions. Catedrático de Universidad* can take positions of Department Chair, Dean (Faculty), Director (School) and Rector. To apply for a permanent position, after getting a PhD, researchers usually apply for a postdoc grant or temporary contract. During three or four years they have to teach and do research in order to pass the habilitation process, which can be either national or regional. Note that national research centers have different positions (e.g. *Científico Titular*, *Investigador Científico*), different professional tracks and only research duties[11].

## 7.13 Switzerland

PhD Candidates in Switzerland are typically employed by the universities as *Wissenschaftlicher Assistenz I* (Research Assistant I). Beyond performing research work leading to their doctorate and attending a number of courses, PhD Candidates assist their supervisors in teaching and supervising undergraduate students and frequently perform internal tasks in their research groups. Contracts are temporary, renewed annually and with variable duration (in agreement with the group leader), on average three to four years, but never extending more than six years [SW7].

Postdoctoral Researchers are employed by the universities as *Wissenschaftlicher Assistenz II* (Research Assistant II) or *Wissenschaftliche Mitarbeitende I* and *II* (Senior Researchers and Teaching Assistants), depending on their previous experience. Duties include performing own research, teaching and supervision of students and PhD Candidates as well as internal tasks in the research group. The positions are funded by the university institutes themselves or by third parties such as the Swiss National Science Foundation or international funding organizations. Contracts are fixed-term, renewed annually, and with variable duration, on average two and a maximum of six years, in agreement with the group leader [SW8].

Professor positions are organized in three categories: *Assistenzprofessor*, *Außerordentliche Professor* and *Ordentlicher Professor*[14]. Among the three categories only *Assistenzprofessor* are non-tenured positions. Many appointments include a tenure-track plan, in this case an *Assistenzprofessor* is appointed for four years, with the possibility of contract renewal for a period of maximum two years. After this period, candidates with outstanding qualifications are considered for a permanent professorship (in general *Außerordentliche Professor*) through a direct, multi-stage tenure procedure [SW8]. Procedures for granting tenure-track positions are determined by the individual faculties. *Assistenzprofessor* positions can also be funded by a Swiss National Science Foundation (SNF) grant, but in this case the contract does not include a tenure-track plan [SW8].

## 7.14 UK

PhD Candidates in the UK usually have a stipend. Optionally part-time contracts to help with teaching are also available. In general, these contracts do not surpass fifteen hours per week and most students supplement their stipend with a few hours of teaching a week. Most stipends are awarded for three or three and a half years, depending on the funding scheme. The maximum allowed time varies depending on the University, but in general it is four years.

A compelling factor to enforce the maximum four years of PhD is the fact that getting government funded scholarships depends on the majority of the PhD Candidates from the institution completing their PhD in four years or less during the past five years. Funding for PhD positions in the UK are almost always provided by the national government or funding organizations. Grants fund the PhD Candidate's living expenses and whatever fees the university demands. Some grants are more generous than others regarding expenses for experimental work and the stipend paid to the student. Each funding body has its own restrictions on who is eligible to receive funding, and funds are limited, so PhD positions are competitive in almost all institutions. Funding for PhD Candidates is nearly always awarded to the department or the research supervisor, not the student. Most funding is specific to UK-citizens living in the UK. The UK research council also funds students from EU countries, but the stipend covers only university fees and not living expenses[7].

Postdoctoral Researchers in the UK have temporary fixed-term contracts with the universities with the contract duration depending on the funding source. Duties include performing own research, teaching and supervision of Bachelor and Master students. In case Postdoctoral Researchers are employed by the university for more than three years (even if having more than one single contract) they notionally become "permanent" members of staff. They might still become unemployed when the funding paying their salaries finishes, but in this case the university needs to provide some redundancy compensation. Since 2009 researchers funded by the national government have their employment governed by a scheme called "The Concordat", which essential gives them various rights like the one to be treated as permanent staff, maternity leave, sickness leave, etc[7].

University professor positions in the UK are organized in three ranks: Lecturer, Senior Lecturer/Reader and Professor. All positions are permanent and don't include tenure track schemes. Lecturer positions usually start with a probationary period. The length of a probationary period can vary a lot according to the institution and the length of the contract of employment. Reader/Senior Lecturer or Professor positions do not include a probation period. Promotion to a higher rank can happen at any time in the career, whenever the candidate satisfies the promotion criteria defined by the institution. Each year there is a promotion round and the criteria for promotion for each level is published and candidates can be selected or self-nominate for a promotion. The Department first decides whether they want to support the candidate or not. Then at the faculty level a judgement is made about quality, partially in comparison with other candidates from across the departments in the faculty that year, creating therefore a ranked list with a quality cut off. For Reader and Professor this stage involves the faculty consulting independent referees about the work of the candidate. Then at the university level the ranked lists are combined into a single ranked list and as many candidates are promoted as can be afforded. Professors in the UK are said to hold a chair in a subject or subject area, so are often referred to as "The Chair in/of X" where X is their subject. Chairs may be established or personal. An established chair is one that is not tied to the individual who currently holds it. A personal chair on the other hand, is tied to the individual who has it. If they leave or retire, the chair is not guaranteed to be available for another person to take up[7].

# 8 Salaries

## 8.1 Salaries: Overview

We now present the results for the salaries of PhD Candidates and Postdoctoral Researchers (Section 8.2, table 10) and Professors at various ranks (Section 8.3, table 11).

Considerable variations exist between different countries. Possibly even more than elsewhere in this report, any comparison across countries requires care in light of the differences in career systems, position definitions (see Section 7) and salary systems. In addition, in Germany and Switzerland, since the figures apply at the national level, there may be significant variation between regions, institutions and seniority levels. Such factors as individual contracts and bonuses can also play an important role.

All salary figures presented are **earned yearly gross salaries in Euros**, rounded to the nearest integer. Important comments on the specifics of every country and how the figures were determined follow each of the two tables. We chose to report here only earned gross values, without taking into consideration the different tax systems, and therefore without reference to final net values earned by academics and the total gross costs borne by employers.

## 8.2 Salaries: PhD Candidates and Postdoctoral Researchers

Table 10 presents the yearly gross salaries paid to PhD Candidates and Postdoctoral Researchers in the selected countries.

***Table 10. PhD Candidate and Postdoctoral Researcher salaries (yearly gross in Euros)***

| | PhD | | Postdoc | |
|---|---|---|---|---|
| | ***Min*** | ***Max*** | ***Min*** | ***Max*** |
| **Austria** | 37,751 | 44,846 | 50,270 | 58,617 |
| **Belgium** | 38,266 | 41,339 | 48,166 | 51,238 |
| **Estonia** | 11,781 | 26,484 | n.a | n.a |
| **France** | 20,220 | 24,300 | 34,608 | 38,940 |
| **Germany** | 41,259 | 48,239 | 44,749 | 52,496 |
| **Greece** | n.a | n.a | n.a | n.a |
| **Italy** | 13,638 | | 19,368 | 30,000 |
| **Latvia** | 1,356 | | - | - |
| **Netherlands** | 25,752 | 32,928 | 30,012 | 45,972 |
| **Romania** | 2,400 | 3,254 | n.a | n.a |
| **Spain** | 14,400 | 19,000 | 20,000 (2) | 23,000 (1) |
| **Switzerland** | 59,164 | 69,276 | 70,797 | 76,966 |
| **UK** | 18,720 | | 37,444 | 48,800 |

***Austria***

The indicated salaries are based on an employment contract with a working time of 40 hours per week. In Austria 14 monthly salaries are paid per year. Often PhD Candidates are employed for less working hours per week. However, in specific cases also higher salaries can be paid. Since 2011 all university employees in Austria are paid according to the Austrian Collective Agreement for University Staff (*Kollektivvertrag*) [AT4]. According to this agreement, only initial minimum salaries are defined. Usually the salaries increase with the number of years being employed. According to the indicated figures, valid from 2016, the yearly minimum salary for starting PhD Candidates is € 37,751, this amount is independent of the funding source. The minimum yearly salary for Postdoctoral Researchers is € 50,270. Salaries for Postdoctoral Researchers increase on a yearly basis. The indicated maximum salaries for both categories assume specific numbers of consecutive years (e.g., PhD 4 years and Postdoc 8 years) of employment at the Vienna University of Technology [AT5, AT6]. Note that the maximum salaries paid will vary depending on the institution. Numbers are from January 2016.

***Belgium***

Salaries of PhD Candidates in Belgium vary depending on the funding source, salaries paid to PhD candidates who have a contract with the university as teaching and research assistants are higher than PhD scholarships which in general do not involve teaching and service duties. However, in the case of scholarships, income taxes do not apply, only social contributions. Min and Max values shown in the table are salaries paid to assistant positions in the first and fourth year (note that assistant contracts can have a duration of maximum six years) at the *Université catholique de Louvain*, data from July 2016 [BE15, Appendix B]. National PhD scholarships are around € 24,000 per year, with small differences depending on the agency [BE15, BE16, Appendix B]. Higher scholarships can also be paid when the grant comes from EU or other international projects.

Salaries of Postdoctoral Researcher, similarly to PhD Candidates, also vary according to the type of contract and funding source, initial salaries will depend on previous research experience. Min and Max values shown in table 10 are salaries paid to a starting Postdoctoral Researcher, Max salary considers a Postdoctoral Researcher with four years of experience at the *Université catholique de Louvain* [BE15, Appendix B]. National Postdoctoral fellowships are around € 30,000 per year with small differences depending on the agency [BE15, BE16, Appendix B]. Note that as for PhD scholarships, for Postdoctoral fellowships income taxes do not apply, only social contributions. Higher fellowships can also apply when the grant comes from EU or other international projects.

For both PhD Candidates and Postdoctoral Researchers positions there are only small variations in the salaries across the regions and universities [BE15, BE16]. Working hours for full time positions are 38 hours /week. Number are valid from July 2016.

***Estonia***

In Estonia, academic salaries are not defined at national level. Employment contracts and rules for academic professions are regulated by the Universities Act, the Organisation of Research and Development Act and the Standard of Higher Education [EE3]. There are no national salaries scales for research and teaching staff, including PhD Candidate, Postdoctoral Researcher and Professor positions. Universities have freedom to set their own salaries values and progression. Salaries will therefore vary depending on the employer university, field and institute budget. Top-level researchers from abroad often are paid competitive salaries. Differently than most countries included in this study, salary values presented in table 10 and 11 were collected contacting directly all ICT institutes, from both Universities and Universities of Applied Sciences, in Estonia. Min and Max salaries for PhD Candidates shown in Table 10 are the lowest and highest salary paid among the institutions consulted (note that the numbers are not an average of minimum and maximum salaries paid in all institutions consulted). In all universities, PhD students studying full time have the right to receive a monthly scholarship of € 422, those serving as teaching/research assistants are paid on top of the scholarship. Working hours for full time positions are 40 hours /week. Numbers are valid from January 2016.

***France***

Salaries of PhD Candidates in France are in general fixed and do not progress from the beginning to the end of the doctoral contract. The minimum value in the table corresponds to the amount paid to PhD Candidates developing their thesis in a University and who are fully dedicated to their research and thesis work (i.e. no teaching or additional duties). Maximum value corresponds to contracts which involve not only research and thesis work but also complementary activities like teaching, scientific and technical information, development of research, consultancies or expertise to companies or public authorities [FR2]. Another variation found are PhD Candidates who have contracts, and develop their research work, in industrial organization on the frame of the system called "*Conventions industrielles de formation par la recherché" (CIFRE)*. CIFRE PhDs are paid a minimum salary of € 1,957 per month [FR2]. Research institutes which employ PhD Candidates also present slightly variations on the remuneration system, e.g., INRIA pays a gross salary of € 1,957 per month for the two first years, and € 2,058 per month for the third year [FR8]; CNRS pays € 1,757 per month (only research and thesis work) and € 2,095 per month (with complementary activities) [FR9].

Salaries of Postdoctoral Researchers slightly vary according to the institution and research project. Table 10 shows values paid to a post-doc with a contract with CNRS (€ 2,500 per month) [FR9] and with INRIA (€ 2,620 per month) [FR8]. Initial salaries usually remain the same until the end of the contract, but might increase in a case of contract extension[20].

Numbers are valid for 2016. Working hours for both PhD Candidates and Postdoctoral Researchers, in full time positions, are 35 hours /week.

***Germany***

PhD and Postdoctoral positions remuneration is defined by the *Tarifvertrag im Öffentlichen Dienst* (TV-L) [GE7, GE13-GE15 Appendix B]. In general PhD Candidates have a salary within (or corresponding to a percentage of) the pay scale (*Tarif)* TV-L 13. The exact grade or level (*Stufe*) is defined based on previous experience, family situation, working hours and tasks defined by the working contract (teaching load, supervision and other duties). Students in Engineering, Computer Science and Applied Mathematics, high-demand occupations in Germany, in general earn the full rate of the respective TV-L 13 salary grade appointed, for a full time (39.83 hours/week) working contract involving teaching and supervision responsibilities [GE16].

*Min* and *Max* values shown in the table correspond respectively to the starting level (*Stufe 1*) and the level 3 (*Stufe 3*) of the full scale TV-L 13, considering a first and a third year PhD Candidate, respectively. Please note that the initial salary might change considering the level of experience and family situation of the candidate (for all grades within the TV-L 13 scale, see Appendix B and reference GE15).

Postdoctoral Researchers are often paid on the same pay scale as PhD Candidates, i.e., TV-L 13, with the entry salary starting on a higher grade according to the experience and family situation. Postdoctoral Researchers with special responsibilities, such as junior research group leaders, may be paid in a higher salary scale, e.g., TV-L 14, TV-L 15, TV-L 15Ü [GE16]. Working hours for a full time working contract is also 39.83 hours per week.

*Min* and *Max* values shown in the table correspond to a Postdoctoral Researcher starting at *Stufe* 1 within the full *tariff* TV-L 14 and *Stufe* 3 (for all levels within the TV-L 14, please see Appendix B and reference GE15). Note that this was an arbitrary choice since the initial salary varies according to previous experience.

Salary values presented in table 10 are from 2016 [Appendix B, GE15].

***Greece***

The salaries for PhD candidates and Postdoctoral Researchers for Greece unfortunately at this point could not be reported. According to our contacts in Greece, there are significant variations depending on the rules regulating each particular category of project in which the candidate/researcher is involved. Scholarships provided by the State

[20] Antoine Petit, personal communication

Scholarships Foundation-IKY, are € 450 per month for PhDs and € 600 per month for Postdocs. Some research centers provide PhD scholarships which may vary from € 500 to € 800 per month [16].

***Italy***

Salaries of PhD Candidates in Italy are nationally fixed and do not progress from the beginning to the end of the doctoral contract. Since 2008 PhD salary is fixed on € 1,137 per month (on a 12-month basis), gross value for a full time contract, corresponding to 38 hours/week [IT5,[17]].

Salaries of Postdoctoral Researchers are defined by the professor/group leader opening the position. Initial salary cannot be lower than € 19,367 per year, usually maximum salary does not surpass € 30,000 per year. Values shown on table 10 correspond to gross yearly salaries for a full time (38 hours/week) position. The salary is fixed and remains the same until the end of the contract, the exact value of the initial salary depends on the researcher previous experience[17].

***Latvia***

PhD Candidates in Latvia are students in universities doctoral programs which usually do not pay tuition fees and receive a monthly scholarship of € 113[18.]

Postdoctoral Researcher positions do not exist in Latvia. After receiving a doctor degree those following an academic career are immediately eligible to positions of *Docents* or even *Asociēts Profesors*[18].

***The Netherlands***

Academic career regulations and salaries in the Netherlands are defined by the collective agreement (CAO) of Dutch Universities, set by the Association of Universities in the Netherlands (VSNU) [NE7].

PhD Candidates are employed as research/teaching assistants and paid according to the Scale P of the CAO table of salaries [NE7, Appendix B]. The initial salary corresponds to the salary grade P0 for a period of one year, at the end of this first year salary progresses automatically (with no performance assessment) to the grade P1. Each subsequent salary increase shall take place only after annual assessments [NE5-NE7]. Min and Max values shown in the above table correspond to the grades 0 and 3 within the scale P.

Postdoctoral Researchers are employed as research/teaching assistants and paid according to the Scale 10 of the CAO table of salaries [NE7, Appendix B]. The exact initial salary, which will correspond to a grade within Scale 10, depends on previous relevant experience and family situation. Min and Max values shown in the table 10 correspond to the grades 3 and 6 within the Scale 10 [NE7, Appendix B].

Working hours for both PhD Candidates and Postdoctoral Researchers, in full time positions, are 38 hours /week. Salary values presented in table 10 are valid from January 2016 [NE7].

***Romania***

Only PhD candidates that benefit from a doctoral grant receive a salary that depend on the university and progress from the first to the third year. Min and Max values shown in table 10 are paid to a first and third year PhD Candidate. In some cases, PhD candidates may also receive extra income from research projects[19].

Salaries for postdoc researchers vary according to the research project and institution and minimum and maximum values are not available. Working hours for both PhD Candidates and Postdoctoral Researchers, in full time positions, are 40 hours per week.

***Spain***

PhD candidates are funded by national scholarships, research grants of professors, or industry funding programs. The numbers in the table refer to Spanish grants such as FPU (*Formación de Profesorado Universitario*) or FPI (*Formación de Personal Investigador*) or Catalan grants FI (*Formació d'investigadors*). These grants progress along the years, Min and Max values shown are paid in the first and third year, respectively[11]

Postdoctoral researchers positions in Spain may adopt a variety of forms, from a postdoctoral grant to the more formal "*Ayudante Doctor"* position. In both cases the position is temporary and entails both research and teaching. Postdoctoral research can also be done under some specific grants or contracts such as "Ramon y Cajal" from Spanish Government or "Beatriu de Pinós" from Catalan Government, as well as EU grants. In some cases, an international period after getting the PhD and before application is mandatory. Min and Max salaries shown in the table are paid to *Investigador Postdoc* and *Ayudante Postdoc*, respectively[11].

***Switzerland***

Salaries of PhD Candidates and Postdoctoral Researchers are not uniform across the country; each University defines its own base values and increasing steps. *Min* and *Max* values shown in table 10 are calculated averages of annual gross salaries paid to a first and a third year PhD and Postdoctoral Researcher in a full time position (42 hours per week) and 100% employment rate at four Cantonal Universities (Bern, Geneva, Neuchatel, Zurich) and the two Federal Institutes of Technology (EPFL and ETHZ) [SW9]. Note that in general not all PhD positions correspond to a 100% employment rate, depending on the area, department, teaching and supervision duties involved, this can correspond to 75% or 50% of a full rate salary, although working hours remain at 42 hours/week. In Informatics and Engineering, considered fields of high demand in Switzerland, generally PhDs contracts correspond to a 100% position.

For reference the exchange rate used was 1EUR = 1.2CHF. Salary values presented in table 10 are valid from January 2014 [SW9].

***UK***

PhD students in the UK receive a stipend, which is tax-free and covers the Universities fees and living expenses, the exact value can be defined at the University level, but most institutions pay the basic values recommended by the national government, value shown in the table. The salary is fixed and do not progress from the beginning to the end of the doctoral studies[7].

Postdoctoral Researchers can have positions of Research Assistants, Research Associates and Research Fellows which have different levels of responsibility and autonomy. In almost all cases in the UK, Postdoctoral Researchers will not be part of the faculty of the University but are instead paid by money that comes from research grants from national or international funding bodies[7]. However, their pay is based on the national pay spine negotiated by JNCHES (Joint Negotiating Committee for Higher Education Staff) [UK7], see details in Section 8.3.

The initial salary will depend on previous experience and the level of responsibility and autonomy expected in the current position. Min and Max values shown in table 10 correspond to the grade point UE7 (spinal point 30 to 39 in the national single pay spine) in the salary tables form the University of Edinburgh [UK8, Appendix B]. Please note that it is also possible to find Postdoctoral Researchers paid within the same scale points of Lecturers, Readers or even Professors, depending if they are operating more as independent researchers (rather than just following a research program designed by a member of academic staff)[7]. Note that there might be slight differences in the way the universities internal scales define their correspondence to the national spinal scale. For reference the exchange rate used was 1GBP = 1.17EUR.

## 8.3 Salaries: Professors

Table 11 presents the yearly gross salaries in Euros paid to university professors in the surveyed countries. They are only meaningful in connection with the country-specific notes that follow the table. When comparing salary across countries please bear in mind that:

- Values shown are paid gross salaries. Neither employer expenses nor net salaries were considered. Bonuses for special services, performance or paid regularly at the end of the year in some countries were also not considered.
- Taxation and social welfare systems are different (in some countries people contribute from their gross salary while in others contributions are paid by the state).
- Overall salary in some countries may be higher due to optional bonuses/incentives depending on role/function.
- Career progressions are different (some are time based, others are determined by individual and/or local negotiations, others are a mix).

| *Table 11. Professor salaries (yearly gross in Euros)* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Assistant Professor** | | | | **Associate Professor** | | | | **Full Professor** | |
| | **Min** | | **Max** | | **Min** | | **Max** | | **Min** | **Max** |
| **Austria** | 59,448 | | | | 64,459 | | 88,441 | | 67,798 | 91,679 |
| **Belgium Wallonia** | 56,701 | | 88,888 | | 66,333 | | 101,080 | | 74,257 | 113,272 |
| **Germany** | 48,096 | | 55,200 | | 60,381 | | 69,509 | | 66,950 | 78,906 |
| **Greece** | 13,800 | | n.a | | 15,972 | | n.a | | 17,508 | n.a |
| **Italy** | 34,898 | | | | 50,831 | | 82,987 | | 72,431 | 106,104 |
| **Netherlands** | 40,284 | | 62,676 | | 55,836 | | 74,664 | | 61,848 | 90,060 |
| **Spain** | 30,619 | | n.a. | | 34,689 | | n.a. | | 43,582 | n.a. |
| **Switzerland** | 111,861 | | 155,998 | | 127,077 | | 174,431 | | 143,259 | 195,689 |
| **UK** | 46,009 | | 61,768 | | 58,233 | | 69,498 | | 67,479 | 113,204 |
| **Belgium Flanders** | ***Docent*** | | | | ***Hoofddocent*** | | | | ***Hoogleraar*** | ***Gewoon Hoogleraar*** |
| | 49,077 | 72,342 | | | 56,200 | 88,290 | | | 65,803 100,445 | 73,704 112,599 |
| **Estonia** | ***Assistent*** | | | | ***Lektor*** | | | | ***Dotsent*** | ***Professor*** |
| | 12,600 | 30,000 | | | 14,832 | 34,224 | | | 16,800 52,800 | 20,568 91,200 |
| **France** | ***Maître de Conférences*** | | | | | | | | ***Professeur des Universités*** | |
| | 25,737 | | 45,891 | | | | | | 36,780 | 65,064 |
| **Latvia** | ***Asistents*** | | | | ***Lektors*** | | ***Docents*** | | ***Asociēts Profesors*** | ***Profesors*** |
| | 5,771 | 6,960 | 7,222 | 8,640 | 9,032 | 15,382 | 11,286 | 20,535 | 14,103 | 40,963 |
| **Romania** | ***Asistent*** | | | | ***Lector*** | | ***Conferentiar*** | | | ***Profesor*** |
| | 4,800 | 6,334 | 5,291 | 10,115 | 5,683 | 13,195 | 9,872 | 27,339 | | |

***Austria***

As for the other groups of university employees, only initial minimum salaries for professors are defined by the Austrian Collective Agreement for University Staff [AT4]. These salaries increase with the number of years employed. Minimum salaries for Associate Professors and Full Professors increase every six years provided that there was at least one positive evaluation (those rules do not apply for the group of Assistant Professors). The salaries which are indicated in the table refer to a full-time employment (40 hours/week). The minimum initial salary for Associate Professors is € 64,459 at the beginning, and € 88,441 if they have been employed for 24 years. The initial minimum salary for Full Professors is € 67,798 at the beginning of the appointment, and € 91,679 after 24 years. Maximum salaries shown are from the Vienna University of Technology [AT4, AT7]. Note that some differences might exist depending on the employer university. Number are valid from January 2016.

The pension contributions for all university employees are paid half by the university and half by the employees (the employee's share is part of the gross salary). Additional contributions to pension fund are paid by the universities for all university employees who are employed for more than 2 years.

***Belgium***

Professor career regulations and salaries scales and seniority grades in Belgium are defined by the law of each independent region. Full-time working hours amount to 38 hours/week.

*Flanders*

Salary tables, seniority and increasing steps, as well career progression are defined at the region level. Within a given category the initial salary is determined by previous relevant experience. Min values presented in table 11 for all four categories are gross salaries at the starting point of the salary scale [BE17, BE18, Appendix B]. Max values presented correspond to the salary paid after 24 years of seniority for a *Docent*, after 20 years of seniority for a *Hoofddocent,* after 18 years of seniority for a *Hoogleraar and* after 24 years of seniority for a *Gewoon Hoogleraar* [BE17, BE18, Appendix B]. Note that salary increases within the same category happen automatically at every three years.

*Wallonia*

Salary tables, seniority and increasing steps as well career progression are defined at the region level. Within a given category the initial salary is determined by previous relevant experience. Min values presented in table 11 for all four categories are gross salaries at the starting point of each salary scale, therefore considering no seniority [BE15, Appendix B]. Max values presented correspond to a salary paid after 24 years of seniority for *Chargé de Cours*, after 18 years of seniority for a *Professeur* and after 15 years of seniority for a *Professeur Ordinaire* [BE15, Appendix B]. Note that salary increases within the same category happen automatically every three years.

***Estonia***

As described in Section 8.2, in Estonia academic salaries are not defined by the national government. There are no national salaries scales for research and teaching staff, including Professor positions. Universities have freedom to set their own salaries values and progression. Salaries will therefore vary depending on the employer university, field and institute budget. Differently than most countries included in this study, salary values presented in table 11 were collected contacting directly the administration of all ICT institutes, from both Universities and Universities of Applied Sciences, in Estonia. Min and Max salaries shown in table 11 for all four categories are the lowest and highest salary paid in a given institution consulted (note that the numbers are not an average of minimum and maximum salaries paid in all institutions consulted). Note that salaries shown are specific for ICT Professors. Since there are no academic salary scales, and the institutes have freedom to negotiate and define each employee's salary, the only possible way to get salaries estimation in Estonia is by direct contact with the employer institutes. Number were collected in 2016.

***France***

Professor (*Maîtres de Conférences* and *Professeur des Universités*) salaries and career progression in France are regulated by the *Ministère de l'enseignement Supérieur et de la Recherche* (Ministry of Higher Education and Research). The system is strongly centralized; salaries for a given category are exactly the same across the country and in all universities and other public HEI [FR10]. Working hours for a full time position are 35 hours/week.

*Maîtres de Conférences* positions are divided in two levels: a *classe normale* comprising eight pay grades and a *hors-classe* comprising eight pay grades [FR6, FR11]. *Professeur des Universités* positions are divided in three levels: *a deuxième classe* comprising eight pay grades; a *première classe* comprising seven pay grades and a *classe exceptionnelle* comprising five pay grades [FR7, FR12].

Min values shown in table 11 correspond to the salary paid at the beginning of the career in both categories (i.e. first pay grade at *classe normale* and *deuxième classe*, respectively) [FR11, FR12]. Max values correspond to the highest pay grade in the *classe normale* for *Maîtres de Conférences* and in the *première classe* for *Professeur des Universités* [FR12].

For *Maîtres de Conférences* the salary in the highest pay grade of the level *hors-classe* is € 53,829, while for *Professeur des Universités* the highest pay grade of the level *classe exceptionnelle* is € 73,784 [FR11, FR12]. Numbers are from 2016.

In a given level, salary progression (moving to a higher pay grade) is awarded automatically after given periods of time, which are defined by the statutory regulations of the group. Promotion to a higher level, in the same category, on the contrary is not granted automatically for seniority, but involves a performance review process.

***Germany***

Professor salaries in Germany are since 2005 regulated by the new federal system of remuneration W (*Bundesbesoldungsordnung W*), which replaced the old C salary scheme (*Bundesbesoldungsordnung* C) [GE14, GE17-GE18]. The pay regulation W applies to professors, as well lecturers and scientific assistants, and contains the pay grades W1, W2 und W3 which apply to *Juniorprofessor*, *Außerordentlicher Professor* and *Ordentlicher Professor*, respectively [Appendix B, GE14, GE17-GE18].

In the remuneration system W the financial rewarding for seniority is replaced by a system with a base salary added by family allowances and, in case of grades W2 and W3, performance bonuses for outstanding achievements in research, teaching, promotion of young scientists and undertaking of special administrative and management functions in the university (rector, dean, chair, etc). The criteria for the payment of performance bonuses are defined independently by each state (*Bundesländer*) and University regulations, but can vary significantly among different areas and depend on contractual negotiations [GE19].

Table 11 shows the base gross salaries in the pay grades W1, W2 and W3 (as of March 2016) without any addition of bonuses or allowances. Min and Max values shown correspond to the base salaries paid in the regions Hessen and Baden-Württemberg, respectively. The national averages of the base salaries in the different grades are: € 52,376 (W1), € 65,069 (W2) and € 72,725 (W3) [Appendix B, GE20]. Working hours for a full time position are 40 hours/week. Number are from March 2016.

Some further peculiarities affect the salary data for Germany. Professors have a special status ("*Beamte*") in which they do not pay for their pensions; the employer also pays for health insurance, and there is a premium for families, initially small but growing with the number of children. In addition, a percentage of W2 professors, and a higher percentage of W3 professors, get a performance bonus. As a consequence, some German professors consulted for the present report consider that table 11 underestimates the actual professor salaries by 25% to 30%.

**Greece**

Professor salaries and career progression in Greece are regulated by the national government. The system is strongly centralized and the salaries and progression steps for the different categories are the same across the country, and in all universities or other public HEIs. On Table 11 are shown the minimum values determined by law. Maximum values are difficult to be estimated since increases for seniority, as well as a number of bonuses, can apply [16]:

Bonus for preparation of teaching:

- Full Professor: 390 €/Month
- Associate Professor: 368 €/Month
- Assistant Professor: 335 €/Month

Bonus for the organization and participation to conferences and for using the library:

- Full Professor: 273 €/Month
- Associate Professor: 184 €/Month
- Assistant Professor: 128 €/Month

Bonus for research, dissemination and exploitation of research programs:

- Full Professor: 226 €/Month
- Associate Professor: 215 €/Month
- Assistant Professors: 200 €/Month

***Italy***

Professor salaries and career progression in Italy are regulated by the national government. The system is strongly centralized and the salaries and progression steps for the different categories are the same across the country, and in all universities or other public HEI. Payment grades and progression steps are defined by the salary tables published by the government. The last revision of the salary tables dates from December 2011, after the reform of the academic career system (see Section 7.4). Values shown in table are for the gross yearly salaries in Euros (*annuo lordo*) [Appendix B], note that professors in Italy receive a thirteenth salary.

Salaries shown in table 11 for Assistant Professors (*Ricercatori*) consider academics taking employment after the reform, i.e. the salary is constant throughout the three-year fixed-term appointment (see Section 7.4). For Assistant Professors employed before the 2011 reform, salary grades can range from € 37,172 and € 65,078 per year corresponding to 35 years of seniority [IT6, Appendix B]. In the old system Assistant Professor positions were not fixed-term, after the first three years, tenure could be reached and a career as Assistant Professor established, without necessarily promotion to a higher level professorship.

Min and Max values shown in table 11 for Associate Professors (*Professori Associati*) correspond to the salary at the beginning of the career, after the 2011 reform, therefore considering a position which is tenured from the beginning of the appointment (see Section 7.4), and after 27 years of seniority in the same position [IT6, Appendix B].

Min and Max values shown in table 11 for Full Professors (*Professori Ordinari*) correspond to the salary at the beginning of the career, after the reform, and therefore considering a position which is tenured from the beginning of the appointment (see details in Section 7.4), and after 20 years of seniority in the same position [IT6, Appendix B].

For all three categories the old salary system was based on automatic salary increase every two years, in the new system instead, every three years a professor has to apply for a salary increase and will be evaluated according to rules defined by each University [IT4]. Working hours for a full time position are 38 hours/week.

Please note that the retirement ages, 35, 27 and 20 years of seniority for Assistant, Associate and Full Professor, respectively, were chosen as a reasonable reference, not necessarily all professors will retire exactly after this number of years in the respective positions [21].

[21] Enrico Nardelli, personal communication

***Latvia***

Academics in Latvia are employed directly by the HEIs and are not civil servants. Min salaries are determined by the national government while Max salaries vary from institution to institution. HEI with a higher budget pay higher salaries. The institutional funding comes directly from the national government and is calculated based on the number of students enrolled per institution. The higher the number of students on a determined HEI, the higher the budget and therefore, higher salaries can be paid to the teaching/research staff. In practice tough most HEI are able to pay only minimum salaries[18].

Differently than for all other countries included in this study, the numbers for maximum salaries in Latvia were collected via informal polling[18]. The Deans of the ten HEI offering studies in Informatics were interviewed and asked for the maximum values paid to the different professor positions in their institution. Min values are determined by the national government and are essentially the same across all HEI in the country. Maximum values paid vary according to the budget of the organization, the Max values shown in table 11 are the highest salary paid in one of the institutions consulted (note that the numbers are not an average of the salaries paid in the ten institutions). Salaries have been at this level since 2008, due to the economic recession in the country no salary increase has been applied in the last seven years[18].

***The Netherlands***

Professor career regulations and salaries in Netherlands are defined by the collective agreement (CAO) of Dutch Universities set by the Association of Universities in the Netherlands (VSNU) [NE7]. Salaries scales and grades are defined by the CAO table of salaries [Appendix B, NE7]. The full-time working hours amount to 38 hours/week.

The two positions of *Universitair Docent* (UD2 and UD1) allow a career from salary scale 10 to salary scale 11 (UD2), or from salary scale 11 to salary scale 12 (UD1). The two positions of *Universitair Hoofddocent* (UHD2 and UHD1) allow a career within salary scale 13 (UHD2) and salary scale 14 (UHD1). The two positions of *Hoogleraar* (H2 and H1) allow a career from salary scale 15 to scale 16 in position H2 and scale 17 to scale 18 in position H1, respectively [NE5-NE7]. *Hoogleraar 2* are in general the regular full professor positions in Dutch Universities, positions of *Hoogleraar 1* are only appointed in cases of special higher responsibilities [22].

Within a given scale the initially salary grade is determined by age and experience. As a rule, salary progression within the same pay scale is granted every year after an annual performance review. Promotion to a higher pay scale in the same category (e.g. from a UHD2 (scale13) to a UHD1 (scale 14) position) is not automatically granted on the sole basis of seniority. In this case a more thorough promotion process is established, to be promoted the candidate needs to perform conceptual and coordinating tasks in teaching and research that match the job profile of the higher position. Promotion to a different category (e.g. from a UHD1 to H2 position) is only possible via a new recruitment and selection procedure to fill a new vacant position [NE5-NE7]. This salary progression scheme is generally applied in the whole country, although there might be occasionally variations in different universities where professorships and different career tracks can be mapped slightly differently to the salary scales [22].

Salary values presented in table 11 are valid from January 2016 [NE7, Appendix B].

***Romania***

Professors salaries are regulated by the Ministry of Education and defined based on the number of working years and performance. Performance bonuses for outstanding achievements in research, teaching, and undertaking of special administrative and management functions in the university (rector, dean, chair, etc.) are also paid. The actual salaries depend (within the legal range) on university, faculty and department financial status. The pension contributions, health insurance and social security contributions are paid partly by the university and partly by the employee[19].

Minimum salaries show in table 11 for all four positions are for a member of staff in the first year of employment in the given position, without previous experience, and with standard research activity. The amount increases every year,

[22] Jan van Leeuwen, personal communication

based on two factors: number of working years and performance. Max salaries shown for *Asistent* positions are paid after three years, note that *Asistent* are temporary positions (See Section 7.11). For *Lector*, C*onferentiar* and *Profesor* positions Max values shown in table 11 are the maximum salaries that can be reached after 40 years of experience, and outstanding research activity. The research activity is evaluated based on national standards, available for each science domain [RO1][19]. Salary values presented in table 11 are valid from January 2015. The exchange rate considered was 1 EUR = 4.5 RON.

***Spain***

Professors in Spain are civil servants, initial minimum salaries shown in table 11 are fixed and defined by the national government[11]. Numbers are from 2015. Maximum values are not defined by the government and cannot be estimated with precision since it can vary according to a number of factors, as well as due to regional economical differences[11]:

- Seniority: at every three years (*Trienios*) the salary of each category is increased by the same amount. Currently an increment of € 564 per year applies.
- *Quinquenio*: at every five years professors can apply for a salary complement according to the quality of their academic activities. The universities are in charge of the assessment and decisions. Also additional complement can be obtained from the regional government and vary from region to region. For "Q*uinquenios*" the amount increased is also different for each position.
- *Sexenio*: at every six years professors can apply for a salary complement according the quality of their research activities. In this case a Spanish agency is in charge of the assessment and decisions for the whole country. Also additional complement can be obtained from the regional government and vary from region to region. For "*Sexenios*" the amount increased is different for each position.
- *Special duties*: there are additional salary complements depending on administrative duties (rector, vice-rector, dean, director, etc).

***Switzerland***

Professor salaries vary across Switzerland. Each canton defines its own base values and increasing steps; the salaries at the two Federal institutes of Technology (EPFL and ETHZ, the only two federal Universities) are defined by the federal government. In the cantonal Universities, salaries are defined by grades (*Lohnstufe*) in specific pay scales (*Lohnklasse*) [SW9]. At EPFL and ETH a minimum and a maximum salary is defined but there are no predefined grades and progression steps in between [SW9].

In table 11, Min and Max values are averages of minimum and maximum annual gross salaries paid to professors at four Cantonal Universities (Bern, Geneva, Neuchatel, Zürich) and EPFL/ETHZ in a full-time position (42 hours/week) and 100% employment rate [SW9].

For reference the exchange rate used was 1 EUR = 1.2 CHF. Salary values presented are valid from January 2014, only small differences apply in 2016, values will be updated in the next edition [SW9].

***UK***

The vast majority of professors (Lecturer, Reader, Professor) in the UK are paid according to a national pay spine negotiated by JNCHES (Joint Negotiating Committee for Higher Education Staff). JNCHES is the central committee for multi-employer negotiations and dialogue on pay and pay-related issues formed by representatives from the Universities and Colleges employers' association and higher education staff's unions [UK7]. Each University has its own salary grade structure but in general the correspondence to the national pay spine is uniform. Nevertheless, some slight differences may occur in the way the universities internal scales map to the national pay spine. We have used for this report the salary tables, and corresponding map to the national pay spine, from the University of Edinburgh [UK8, Appendix B]. A Lecturer position allows a career from salary defined by the grade point UE8 (spinal point 37 to 47 in the national single pay spine). A Reader position allows a career from salary defined by the grade point UE9

(spinal point 45 to spinal point 51 in the national single pay spine). A Professor position allows a career from salary defined by the grade point UE10 (spinal point 50 to 66 in the national single pay spine). It is important to keep in mind that for Full Professor positions the difference in the salaries across the country, and universities, will be more accentuated. While there is broad agreement on the implementation of the scale for Lecturer and Reader positions, the scale for Full Professors is more discretionary, with each university selecting how to implement the top portion of the scale and how far up to take it[7]. For reference the exchange rate used was 1GBP=1.17EUR. Salaries presented are valid from August 2016 [UK8, Appendix B]. Note that since the last report there has been an increase in the salaries in GDP, however due to the exchange rates differences the numbers are lower than the ones reported in the previous edition of this report in EUR.

# 9 Conclusion and outlook

The reports produced by Informatics Europe in 2013, 2014, 2015 and the present one provide an analytic and quantitative view of the status of Informatics Education in Europe that is not available through any other source. The data reported here show the current wide diversity across countries regarding degrees, student enrollments, and especially salaries.

The intent of this project, in line with the charter of Informatics Europe, is to obtain and publish such data for Europe as a whole, not just for specific countries. In the first editions we had a clear and explicit strategy: favor accuracy over generality. That decision was made at the time of the first report and continued as a fundamental condition. We have extended our coverage including now a number of countries which could not be included in the first editions. The extrapolation to the rest of Europe, in the case of student numbers and degrees awarded, is just a rough calculation that can give no more than an order of magnitude. It is the goal of Informatics Europe to continue updating this report, refining the analysis and extending it to new countries while respecting as much as possible the same rules of accuracy.

In this effort we will be highly dependent on contributions from members of the Informatics community who have access to reliable sources in their respective countries. We urge them to contact the author and provide them with the relevant sources of information.

Such input is also welcome in the case of countries already covered; the author will be grateful for any comments on the data and sources, and any correction to errors, omissions and misunderstandings that may exist in this edition. More generally, we welcome reader feedback on all aspects of this report.

Any serious policy must be based on the knowledge of facts. The European Informatics community crucially needs solid data. With the help of that community, Informatics Europe is committed to turning the collection, verification and publication of data into an ongoing activity.

# Appendix A: Institutions

The list of institutions offering Informatics higher education in the countries selected - Austria, Belgium, Denmark, Estonia, Germany, Greece, Ireland, Italy, Latvia, The Netherlands, Romania, Spain, Switzerland, and UK - appears below. It includes traditional Universities and University of Applied Sciences, in separate tables, for the countries where these institutions also offer undergraduate studies in Informatics.

This list is intended to evolve into a comprehensive record of all institutions offering undergraduate and graduate studies in Informatics in all of Europe, a goal that we feel has been achieved for the listed countries, although it is of course possible that some information was missed. Note that Institutions' names are given in the local language.

Diversity is also evident in the internal structure of Universities: one finds Faculties, Schools, Sections, Institutes, Departments etc.; some of these units cover Informatics only, others combines it with Mathematics, Electronics, or Electrical Engineering.

***Table A1a. Informatics institutions in Austria – Universities***

| | *University* | *Department/Faculty/School/Institute* | *Website* |
|---|---|---|---|
| 1. | Alpen-Adria Universität Klagenfurt | Fakultät für Technische Wissenschaften | http://www.uni-klu.ac.at/tewi |
| 2. | Johannes Kepler Universität Linz | Fachbereich Informatik | http://informatik.jku.at |
| 3. | Medizinische Universität Wien | Zentrum für Medizinische Statistik, Informatik und Intelligente Systeme | https://campus.meduniwien.ac.at/med.campus/wborg.display?pOrgNr=14533 |
| 4. | Paris Lodron Universität Salzburg | Fachbereich Computerwissenschaften | http://www.uni-salzburg.at/index.php?id=39957&L=1%2F |
| 5. | Technische Universität Graz | Fakultät für Elektrotechnik und Informationstechnik | http://portal.tugraz.at/portal/page/portal/TU_Graz/Einrichtungen/Fakultaeten/FakElektrotechnik |
| 6. | Technische Universität Graz | Fakultät für Informatik und Biomedizinische Technik | http://portal.tugraz.at/portal/page/portal/TU_Graz/Einrichtungen/Fakultaeten/FakInformatik |
| 7. | Technische Universität Wien | Fakultät für Informatik | http://www.informatik.tuwien.ac.at |
| 8. | Technische Universität Wien | Fakultät für Elektrotechnik und Informationstechnik | http://etit.tuwien.ac.at |
| 9. | Universität Innsbruck | Fakultät für Mathematik, Informatik und Physik | http://www.uibk.ac.at/fakultaeten/mip |
| 10. | Universität Wien | Fakultät für Informatik | http://informatik.univie.ac.at |
| 11. | Wirtschaftsuniversität Wien | Department für Informationsverarbeitung und Prozessmanagement | http://www.wu.ac.at/ipm |

| *Table A1b. Informatics institutions in Austria – Universities of Applied Sciences* | |
|---|---|
| ***University of Applied Sciences*** | ***Website*** |
| 1. CAMPUS 02 Fachhochschule der Wirtschaft | http://www.campus02.at |
| 2. Fachhochschule Burgenland | http://www.fh-burgenland.at |
| 3. Fachhochschule Kärnten | http://www.fh-kaernten.at |
| 4. Fachhochschule St. Pölten | http://www.fhstp.ac.at |
| 5. Fachhochschule Technikum Wien | http://www.technikum-wien.at |
| 6. Fachhochschule Wiener Neustadt | http://www.fhwn.ac.at |
| 7. Ferdinand Porsche Fern-Fachhochschule | http://www.fernfh.ac.at |
| 8. FH Campus Wien | http://www.fh-campuswien.ac.at |
| 9. FH JOANNEUM | http://www.fh-joanneum.at |
| 10. FH Oberösterreich | http://www.fh-ooe.at |
| 11. FH Vorarlberg | http://www.fhv.at |

| *Table A2a. Informatics institutions in Belgium – Universities* | | |
|---|---|---|
| ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. KU Leuven | Departement Computerwetenschappen | http://wms.cs.kuleuven.be/cs |
| 2. Université catholique de Louvain | Pôle d'ingénierie nformatique | http://www.uclouvain.be/ingi.html |
| 3. Université de Liège | Département d'Électricité, Électronique et Informatique | http://www.montefiore.ulg.ac.be |
| 4. Université de Mons | Département d'Informatique | http://informatique.umons.ac.be |
| 5. Université de Namur | Faculté d'informatique | https://www.unamur.be/en/inf |
| 6. Université libre de Bruxelles | Departement d'informatique | http://www.ulb.ac.be/facs/sciences/info/index.html |
| 7. Université libre de Bruxelles | Filière Informatique de l'Ecole Polytechnique de Bruxelles | https://cs.ulb.ac.be/infopolyt |
| 8. Universiteit Antwerpen | Departement Wiskunde & Informatica | https://www.uantwerpen.be/nl/faculteiten/faculteit-wetenschappen/departementen/wiskunde-informatica |
| 9. Universiteit Gent | Vakgroep Toegepaste Wiskunde, Informatica en Statistiek | http://www.twist.ugent.be |
| 10. Universiteit Hasselt | Vakgroep Informatica | http://www.uhasselt.be/informatica |
| 11. Vrije Universiteit Brussel | Vakgroep Computerwetenschappen | http://we.vub.ac.be/nl/vakgroep-computerwetenschappen |

| *Table A2b. Informatics institutions in Belgium – University Colleges* | |
|---|---|
| ***University College*** | ***Website*** |
| 1. Karel de Grote-Hogeschool | https://www.kdg.be |
| 2. Artesis Plantijn Hogeschool Antwerpen | https://www.ap.be |
| 3. Hogeschool Gent | https://www.hogent.be |
| 4. Hogeschool West-Vlaanderen | http://www.howest.be |
| 5. Erasmushogeschool Brussel | http://www.ehb.be |
| 6. Hogeschool Odisee | http://www.odisee.be |
| 7. Hogeschool VIVES | https://www.vives.be |
| 8. Thomas More Hogescholen | http://www.thomasmore.be |
| 9. Hogeschool PXL | http://www.pxl.be |
| 10. UC Leuven-Limburg | https://www.ucll.be |
| 11. Haute Ecole Paul-Henri Spaak | http://www.he-spaak.be |
| 12. Haute École de Bruxelles | http://www.heb.be/esi |
| 13. Haute Ecole Libre de Bruxelles Ilya Prigogine | https://www.helb-prigogine.be |
| 14. Haute Ecole Ephec | http://www.ephec.be |
| 15. Haute Ecole Léonard de Vinci | http://www.vinci.be |
| 16. Haute Ecole Libre Mosane | http://www.helmo.be |
| 17. Haute Ecole de la Ville de Liège | http://www.hel.be |
| 18. Haute Ecole de la Province de Liège | http://www.hepl.be |
| 19. Haute Ecole de Namur-Liège-Luxembourg | http://www.henallux.be |
| 20. Haute Ecole Robert Schuman | http://www.hers.be |
| 21. Haute Ecole Louvain en Hainaut | http://www.helha.be |
| 22. Haute Ecole en Hainaut | http://www.heh.be |
| 23. Haute Ecole provinciale de Hainaut - Condorcet | http://www.condorcet.be |
| 24. Institut d'Enseignement de Promotion Sociale de la Communauté française | http://www.iepscf-uccle.be |

| *Table A3a. Informatics institutions in Denmark – Universities* | | |
|---|---|---|
| ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. Aalborg Universitet | Institut for Datalogi | http://www.cs.aau.dk |
| 2. Aarhus Universitet | Institut for Datalogi | http://cs.au.dk |
| 3. Danmarks Tekniske Universitet | DTU Informatik | http://www.imm.dtu.dk |
| 4. IT-Universitetet i København | | http://www.itu.dk |
| 5. Københavns Universitet | Datalogisk Institut | http://diku.dk |
| 6. Roskilde Universitet | Institut for Kommunikation, Virksomhed og Informationsteknologier | http://www.ruc.dk/en/departments/department-of-communication-business-and-information-technologies |
| 7. Syddansk Universitet | Institut for Matematik og Datalogi | http://sdu.dk/en/Om_SDU/Institutter_centre/Imada_matematik_og_datalogi |

| *Table A3b. Informatics institutions in Denmark – University Colleges* | |
|---|---|
| ***University College*** | ***Website*** |
| 1. Aarhus University, School of Engineering | http://ase.au.dk/en/om-ingenioerhoejskolen |
| 2. University College of Northern Denmark (UCN) | http://www.ucn.dk |
| 3. VIA University College | http://www.viauc.com |

| *Table A4a. Informatics institutions in Estonia – Universities* | | |
|---|---|---|
| ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. Tallinna Tehnikaülikool | Infotehnoloogia teaduskond (Faculty of Information Technology) | http://www.ttu.ee/en/?id=20045 |
| 2. Tallinna Ülikool | Digitehnoloogiate Instituut ( School of Digital Technologies) | http://www.tlu.ee/en/School-of-Digital-Technologies |
| 3. Tartu Ülikool | Arvutiteaduse Instituut (Institute of Computer Science) | http://www.ut.ee/en/kontakt/arvutiteaduse-instituut |
| | Tehnoloogiainstituut (Institute of Technology) | http://www.ut.ee/en/kontakt/tehnoloogiainstituut |

| *Table A4b. Informatics institutions in Estonia – Universities of Applied Sciences* | |
|---|---|
| ***University of Applied Science*** | ***Website*** |
| 1. Eesti Infotehnoloogia Kolledž | http://www.itcollege.ee |
| 2. Tallinna Tehnikaülikool (Virumaa kolledž) | http://www.ttu.ee/en/?id=64614 |
| 3. Tallinna Tehnikaülikool (Tartu Kolledž) | http://www.ttu.ee/en/?id=36495 |
| 4. Tartu Ülikool (Narva Kolledž) | http://www.narva.ut.ee/en |
| 5. Tallinna Ülikool (Haapsalu Kolledž) | http://www.tlu.ee/en/studies |

| *Table A5a. Informatics institutions in Germany – Universities* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | Bergische Universität Wuppertal | Fachbereich Elektrotechnik, Informationstechnik, Medientechnik | http://www.fbe.uni-wuppertal.de/en.html |
| 2. | Brandenburgische Technische Universität Cottbus | Institut für Informatik | http://www.informatik.tu-cottbus.de |
| 3. | Carl von Ossietzky Universität Oldenburg | Department für Informatik | http://www.informatik.uni-oldenburg.de |
| 4. | Christian-Albrechts-Universität zu Kiel | Institut für Informatik | http://www.informatik.uni-kiel.de/en/ifi |
| 5. | Eberhard-Karls-Universität Tübingen | Fachbereich Informatik | http://www.informatik.uni-tuebingen.de |
| 6. | Ernst-Moritz-Arndt-Universität Greifswald | Institut für Mathematik und Informatik | http://www.math-inf.uni-greifswald.de/mathe |
| 7. | FernUniversität in Hagen | Fakultät für Mathematik und Informatik | http://www.fernuni-hagen.de/mathinf |
| 8. | Freie Universität Berlin | Mathematik und Informatik | http://www.inf.fu-berlin.de |
| 9. | Friedrich-Alexander-Universität Erlangen-Nürnberg | Department Informatik | http://www.informatik.uni-erlangen.de |
| 10. | Friedrich-Schiller-Universität Jena | Fakultät für Mathematik und Informatik | http://www.minet.uni-jena.de |
| 11. | Georg-August-Universität Göttingen | Institut für Informatik | http://www.uni-goettingen.de/de/138524.html |
| 12. | Hasso-Plattner (Universität Potsdam) | Institut für Softwaresystemtechnik | http://www.hpi.uni-potsdam.de |
| 13. | Heinrich-Heine-Universität Düsseldorf | Institut für Informatik | http://www.cs.uni-duesseldorf.de |
| 14. | Helmut-Schmidt-Universität/Universität der Bundeswehr Hamburg | Fakultät für Elektrotechnik | http://www.hsu-hh.de/et |
| 15. | Humboldt-Universität zu Berlin | Institut für Informatik | http://www.informatik.hu-berlin.de |
| 16. | Jacobs University Bremen | Electrical Engineering & Computer Science | http://ses.jacobs-university.de/eecs-research |
| 17. | Johann Wolfgang Goethe-Universität, Frankfurt am Main | Institut für Informatik | http://www-extern.informatik.uni-frankfurt.de |
| 18. | Johannes Gutenberg-Universität Mainz | Institut für Informatik | http://www.phmi.uni-mainz.de/1847.php |
| 19. | Julius-Maximilians-Universität Würzburg | Fakultät für Mathematik und Informatik | http://www.mathematik-informatik.uni-wuerzburg.de |
| 20. | Justus-Liebig-Universität Gießen | Institut für Informatik | http://www.uni-giessen.de/cms/fbz/fb07/fachgebiete/mathematik/informatik |
| 21. | Karlsruher Institut für Technologie | Fakultät für Informatik | http://www.informatik.kit.edu |
| 22. | Leibniz Universität Hannover | Fakultät für Elektrotechnik und Informatik | http://www.inf.uni-hannover.de |
| 23. | Ludwig-Maximilians-Universität München | Institut für Informatik | http://www.ifi.lmu.de |

| | | | |
|---|---|---|---|
| 24. | Martin-Luther-Universität Halle-Wittenberg | Institut für Informatik | http://www.informatik.uni-halle.de |
| 25. | Otto-Friedrich-Universität Bamberg | Fakultät Wirtschaftsinformatik und Angewandte Informatik | http://www.uni-bamberg.de/wiai |
| 26. | Otto-von-Guericke-Universität Magdeburg | Fakultät für Informatik | http://www.cs.uni-magdeburg.de |
| 27. | Philipps-Universität Marburg | Fachbereich Mathematik und Informatik | http://www.uni-marburg.de/fb12 |
| 28. | Rheinische Friedrich-Wilhelms-Universität Bonn | Institut für Informatik | http://www.informatik.uni-bonn.de |
| 29. | Rheinisch-Westfälische Technische Hochschule Aachen | Fakultät 1, Fachgruppe Informatik | http://www.informatik.rwth-aachen.de |
| 30. | Ruhr-Universität Bochum | Fakultät für Elektrotechnik und Informationstechnik | http://www.ei.ruhr-uni-bochum.de |
| 31. | Ruprecht-Karls-Universität Heidelberg | Informatik | http://www.informatik.uni-heidelberg.de |
| 32. | Technische Universität Braunschweig | Carl-Friedrich-Gauß-Fakultät | http://www.cs.tu-bs.de |
| 33. | Technische Universität Bergakademie Freiberg | Fakultät für Mathematik und Informatik | http://www.mathe.tu-freiberg.de |
| 34. | Technische Universität Berlin | Elektrotechnik und Informatik | http://www.eecs.tu-berlin.de |
| 35. | Technische Universität Chemnitz | Fakultät für Informatik | http://www.tu-chemnitz.de/informatik |
| 36. | Technische Universität Clausthal | Fakultät für Mathematik/Informatik und Maschinenbau | http://www.in.tu-clausthal.de |
| 37. | Technische Universität Darmstadt | Informatik | http://www.informatik.tu-darmstadt.de |
| 38. | Technische Universität Dortmund | Fakultät für Informatik | http://www.cs.tu-dortmund.de |
| 39. | Technische Universität Dresden | Fakultät Informatik | http://www.inf.tu-dresden.de |
| 40. | Technische Universität Hamburg-Harburg | Fachbereich Elektrotechnik, Informatik und Mathematik | http://www.tu-harburg.de/tuhh/studium/studiendekanate/elektrotechnik-informatik-und-mathematik.html |
| 41. | Technische Universität Ilmenau | Fakultät für Informatik und Automatisierung | http://www.tu-ilmenau.de/fakia |
| 42. | Technische Universität Kaiserslautern | Institut für Informatik | http://www.informatik.uni-kl.de |
| 43. | Technische Universität München | Fakultät für Informatik | http://www.in.tum.de |
| 44. | Universität Augsburg | Fakultät für Angewandte Informatik | http://www.uni-augsburg.de/fakultaeten/fai |
| 45. | Universität Bayreuth | Institut für Informatik | http://www.ai.uni-bayreuth.de/de/index.html |
| 46. | Universität Bielefeld | Technische Fakultät | http://www.techfak.uni-bielefeld.de |
| 47. | Universität Bremen | Mathematik und Informatik | http://www.informatik.uni-bremen.de |
| 48. | Universität der Bundeswehr München | Fakultät für Informatik | http://www.unibw.de/inf/fakultaet |

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| 49. | Universität des Saarlandes | Informatik | http://frweb.cs.uni-sb.de |
| 50. | Universität Duisburg-Essen | Ingenieurwissenschaften | http://www.uni-due.de/iw/de |
| 51. | Universität Duisburg-Essen | Institut für Informatik und Wirtschaftsinformatik | http://www.icb.uni-due.de |
| 52. | Universität Freiburg | Institut für Informatik | http://www.informatik.uni-freiburg.de |
| 53. | Universität Hamburg | Fachbereich Informatik | http://www.informatik.uni-hamburg.de |
| 54. | Universität Hildesheim | Institut für Informatik | http://www.uni-hildesheim.de/index.php?id=1320 |
| 55. | Universität Kassel | Fachbereich Elektrotechnik/Informatik | http://www.uni-kassel.de/eecs |
| 56. | Universität Koblenz-Landau | Fachbereich Informatik | http://www.uni-koblenz-landau.de/koblenz/fb4 |
| 57. | Universität Konstanz | Fachbereich Informatik und Informationswissenschaft | http://www.inf.uni-konstanz.de |
| 58. | Universität Leipzig | Fakultät für Mathematik und Informatik | http://www.fmi.uni-leipzig.de/cms |
| 59. | Universität Mannheim | Fakultät für Mathematik und Informatik | http://www.fmi.uni-mannheim.de |
| 60. | Universität Osnabrück | Institut für Informatik | http://www.informatik.uni-osnabrueck.de/index.php.de |
| 61. | Universität Paderborn | Institut für Informatik | http://wwwcs.upb.de/cs |
| 62. | Universität Passau | Fakultät für Informatik und Mathematik | http://www.fim.uni-passau.de |
| 63. | Universität Potsdam | Institut für Informatik | http://www.cs.uni-potsdam.de |
| 64. | Universität Rostock | Institut für Informatik | http://www.informatik.uni-rostock.de |
| 65. | Universität Siegen | Elektrotechnik und Informatik | http://www.fb12.uni-siegen.de |
| 66. | Universität Stuttgart | Informatik | http://www.informatik.uni-stuttgart.de |
| 67. | Universität Trier | Fachbereich Informatik/Wirtschaftsinformatik | http://www.uni-trier.de/index.php?id=2031 |
| 68. | Universität Ulm | Fakultät für Ingenieurwissenschaften und Informatik | http://www.uni-ulm.de/ecs |
| 69. | Universität zu Köln | Institut für Informatik | http://www.informatik.uni-koeln.de |
| 70. | Universität zu Lübeck | Informatik, Technisch-Naturwissenschaftliche Fakultät | http://www.informatik.uni-luebeck.de |
| 71. | Westfälische Wilhelms-Universität Münster | Institut für Informatik | http://cs.uni-muenster.de:8010 |

| *Table A5b. Informatics institutions in Germany – Universities of Applied Sciences* | |
|---|---|
| ***University of Applied Sciences*** | ***Website*** |
| 1. Fachhochschule Aachen | http://www.fh-aachen.de |
| 2. Hochschule Aalen | http://www.htw-aalen.de |
| 3. Hochschule Albstadt-Sigmaringen | http://www.hs-albsig.de |
| 4. Ostbayerische Technische Hochschule Amberg-Weiden | http://www.oth-aw.de |
| 5. Hochschule Anhalt | http://www.hs-anhalt.de |
| 6. Hochschule Ansbach | http://www.hs-ansbach.de |
| 7. Hochschule Aschaffenburg | http://www.h-ab.de |
| 8. Hochschule für Angewandte Wissenschaften Augsburg | http://www.hs-augsburg.de |
| 9. IUBH School of Business and Management | http://www.iubh.de/de/ |
| 10. bbw Hochschule | http://www.bbw-hochschule.de |
| 11. Beuth Hochschule für Technik Berlin | http://www.beuth-hochschule.de |
| 12. Design akademie berlin - SRH Hochschule für Kommunikation und Design | http://www.design-akademie-berlin.de |
| 13. Hochschule für Technik und Wirtschaft Berlin | http://www.htw-berlin.de |
| 14. Hochschule für Wirtschaft und Recht Berlin | http://www.hwr-berlin.de |
| 15. Hochschule für Wirtschaft, Technik und Kultur (HWTK) | http://www.hwtk.de |
| 16. Mediadesign Hochschule für Design und Informatik | http://www.mediadesign.de |
| 17. Fachhochschule Bielefeld | http://www.fh-bielefeld.de |
| 18. Fachhochschule des Mittelstandes (FHM) | http://www.fhm-mittelstand.de |
| 19. Fachhochschule Bingen | http://www.fh-bingen.de |
| 20. Hochschule Bochum | http://www.hochschule-bochum.de |
| 21. Technische Fachhochschule Georg Agricola zu Bochum | http://www.tfh-bochum.de |
| 22. Hochschule Bonn-Rhein-Sieg | www.h-brs.de |
| 23. Fachhochschule Brandenburg | http://www.fh-brandenburg.de |
| 24. Hochschule Bremen | http://www.hs-bremen.de |
| 25. Hochschule Bremerhaven | http://www.hs-bremerhaven.de |
| 26. Europäische Fachhochschule Rhein/Erft | http://www.eufh.de |
| 27. Hochschule für angewandte Wissenschaften Coburg | http://www.hs-coburg.de |
| 28. Wilhelm Büchner Hochschule - Private Fernhochschule Darmstadt | http://www.wb-fernstudium.de |
| 29. Hochschule Darmstadt | http://www.h-da.de |
| 30. Technische Hochschule Deggendorf | http://www.th-deg.de |
| 31. Fachhochschule Dortmund | http://www.fh-dortmund.de |
| 32. Hochschule für Technik und Wirtschaft Dresden | http://www.htw-dresden.de |
| 33. Fachhochschule Dresden | http://www.fh-dresden.eu |
| 34. Fachhochschule Düsseldorf | http://www.fh-duesseldorf.de |
| 35. Nordakademie | http://www.nordakademie.de |
| 36. Hochschule Emden/Leer | http://www.hs-emden-leer.de |
| 37. Fachhochschule Erfurt | http://www.fh-erfurt.de |
| 38. FOM Hochschule für Oekonomie & Management | http://www.fom.de |
| 39. Hochschule Esslingen | http://www.hs-esslingen.de |
| 40. Fachhochschule Flensburg | http://www.fh-flensburg.de |
| 41. Fachhochschule Frankfurt am Main | http://www.fh-frankfurt.de |
| 42. Provadis School of International Management and Technology | http://www.provadis-hochschule.de |
| 43. Hochschule für Kunst, Design und Populäre Musik | http://www.hkdm.de |
| 44. Hochschule Fulda | http://www.hs-fulda.de |
| 45. Hochschule Furtwangen - Informatik, Technik, Wirtschaft, Medien, Gesundheit | http://www.hs-furtwangen.de |
| 46. Europäische Fernhochschule Hamburg | http://www.euro-fh.de |
| 47. Hochschule für Angewandte Wissenschaften Hamburg | http://www.haw-hamburg.de |

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| 48. HSBA Hamburg School of Business Administration | http://www.hsba.de |
| 49. NBS Northern Business School - Hochschule für Management und Sicherheit | http://www.nbs.de |
| 50. Hochschule Hamm-Lippstadt | http://www.hshl.de |
| 51. Fachhochschule für die Wirtschaft Hannover | http://www.fhdw-hannover.de |
| 52. Hochschule Hannover | http://www.hs-hannover.de |
| 53. Leibniz-Fachhochschule | http://www.leibniz-fh.de |
| 54. Hochschule Harz, Hochschule für angewandte Wissenschaften | http://www.hs-harz.de |
| 55. SRH Hochschule Heidelberg | http://www.hochschule-heidelberg.de |
| 56. Hochschule Heilbronn, Technik, Wirtschaft, Informatik | http://www.hs-heilbronn.de |
| 57. Hochschule für angewandte Wissenschaft und Kunst, Fachhochschule Hildesheim/Holzminden/Göttingen | http://www.HAWK-hhg.de |
| 58. Hochschule Hof | http://www.hof-university.de |
| 59. Hochschule Fresenius | http://www.hs-fresenius.de |
| 60. Technische Hochschule Ingolstadt | http://www.thi.de |
| 61. nta Naturwissenschaftlich-Technische Akademie Prof. Dr. Grübler gGmbH | http://www.nta-isny.de |
| 62. Ernst-Abbe-Fachhochschule Jena – Hochschule für angewandte Wissenschaften | http://www.fh-jena.de |
| 63. Fachhochschule Kaiserslautern | www.fh-kl.de |
| 64. Hochschule Karlsruhe - Technik und Wirtschaft | http://www.hs-karlsruhe.de |
| 65. Hochschule für angewandte Wissenschaften Kempten | http://www.hochschule-kempten.de |
| 66. Fachhochschule Kiel | http://www.fh-kiel.de |
| 67. Hochschule Koblenz | http://www.hs-koblenz.de |
| 68. Fachhochschule Köln | http://www.fh-koeln.de |
| 69. Rheinische Fachhochschule Köln | http://www.rfh-koeln.de |
| 70. Hochschule Konstanz Technik, Wirtschaft und Gestaltung | http://www.htwg-konstanz.de |
| 71. Akad University | www.akad.de |
| 72. Hochschule Landshut - Hochschule für angewandte Wissenschaften | http://www.haw-landshut.de |
| 73. Hochschule für Telekommunikation Leipzig | http://www.hft-leipzig.de |
| 74. Hochschule für Technik, Wirtschaft und Kultur Leipzig | http://www.htwk-leipzig.de |
| 75. Fachhochschule Lübeck | http://www.fh-luebeck.de |
| 76. Hochschule Ludwigshafen am Rhein | http://www.hs-lu.de |
| 77. Hochschule Magdeburg-Stendal | http://www.hs-magdeburg.de |
| 78. Fachhochschule Mainz | http://www.fh-mainz.de |
| 79. Hochschule Mannheim | http://www.hs-mannheim.de |
| 80. Hochschule der Wirtschaft für Management | http://www.hdwm.eu |
| 81. Hochschule Merseburg | http://www.hs-merseburg.de |
| 82. Technische Hochschule Mittelhessen - THM | http://www.thm.de |
| 83. Hochschule Mittweida | http://www.hs-mittweida.de |
| 84. Hochschule für angewandte Wissenschaften München | http://www.hm.edu |
| 85. Fachhochschule Münster | http://www.fh-muenster.de/index.php |
| 86. Hochschule Neuss für Internationale Wirtschaft | http://www.hs-neuss.de |
| 87. Hochschule für angewandte Wissenschaften Neu-Ulm (HNU) | http://www.hs-neu-ulm.de |
| 88. Hochschule Niederrhein | http://www.hs-niederrhein.de |
| 89. Fachhochschule Nordhausen | http://www.fh-nordhausen.de |
| 90. DIPLOMA Private Staatlich anerkannte Hochschule | http://www.diploma.de |
| 91. Technische Hochschule Nürnberg Georg Simon Ohm | http://www.th-nuernberg.de |
| 92. Hochschule für Technik, Wirtschaft und Medien Offenburg | http://www.hs-offenburg.de |
| 93. Hochschule Osnabrück | http://www.hs-osnabrueck.de |
| 94. Hochschule Braunschweig/Wolfenbüttel, Ostfalia Hochschule für angewandte Wissenschaften | http://www.ostfalia.de |

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| 95. Hochschule Ostwestfalen-Lippe | http://www.hs-owl.de |
| 96. Fachhochschule der Wirtschaft | http://www.fhdw.de |
| 97. Hochschule Pforzheim - Gestaltung, Technik, Wirtschaft und Recht | http://www.hs-pforzheim.de |
| 98. Hochschule Ravensburg-Weingarten | http://www.hs-weingarten.de |
| 99. Ostbayerische Technische Hochschule Regensburg | http://www.hs-regensburg.de |
| 100. Hochschule Reutlingen, Hochschule für Technik- Wirtschaft-Informatik-Design | http://www.reutlingen-university.de |
| 101. Hochschule RheinMain | http://www.hs-rm.de |
| 102. Hochschule Rhein-Waal | http://www.hochschule-rhein-waal.de |
| 103. Hochschule Rosenheim | http://www.fh-rosenheim.de |
| 104. Hochschule Ruhr West | http://www.hochschule-ruhr-west.de |
| 105. Hochschule für Technik und Wirtschaft des Saarlandes | http://www.htwsaar.de |
| 106. Fachhochschule Schmalkalden | http://www.fh-schmalkalden.de |
| 107. Fachhochschule Stralsund | http://www.fh-stralsund.de |
| 108. Duale Hochschule Baden-Württemberg | http://www.dhbw.de |
| 109. Hochschule für Technik Stuttgart | http://www.hft-stuttgart.de |
| 110. Hochschule der Medien Stuttgart | http://www.hdm-stuttgart.de |
| 111. Fachhochschule Südwestfalen | http://www.fh-swf.de |
| 112. Hochschule Trier | http://www.hochschule-trier.de |
| 113. Hochschule Ulm Technik, Informatik und Medien | http://www.hs-ulm.de |
| 114. Private Fachhochschule für Wirtschaft und Technik Vechta/Diepholz/Oldenburg | www.fhwt.de |
| 115. Fachhochschule Wedel | http://www.fh-wedel.de |
| 116. Hochschule Weihenstephan-Triesdorf | http://www.hswt.de |
| 117. Hochschule Weserbergland | http://www.hsw-hameln.de |
| 118. Westfälische Hochschule Gelsenkirchen, Bocholt, Recklinghausen | http://www.w-hs.de |
| 119. Fachhochschule Westküste, Hochschule für Wirtschaft und Technik | http://www.fh-westkueste.de |
| 120. Technische Hochschule Wildau | http://www.th-wildau.de |
| 121. Jade Hochschule - Wilhelmshaven/Oldenburg/Elsfleth | http://www.jade-hs.de |
| 122. Hochschule Wismar - University of Applied Sciences: Technology, Business and Design | http://www.hs-wismar.de |
| 123. Fachhochschule Worms | http://www.fh-worms.de |
| 124. Hochschule für angewandte Wissenschaften Würzburg-Schweinfurt | http://www.fhws.de |
| 125. Hochschule Zittau/Görlitz | http://www.hszg.de |
| 126. Westsächsische Hochschule Zwickau | http://www.fh-zwickau.de |

| *Table A6. Informatics institutions in Greece* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Web site*** |
| 1. | Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης | Τμήμα Πληροφορικής. | http://www.csd.auth.gr |
| 2. | Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης | Τμήμα Ηλεκτρολόγων Μηχανικών και Μηχανικών Υπολογιστών. | http://ee.auth.gr |
| 3. | Δημοκρίτειο Πανεπιστήμιο Θράκης | Τμήμα Ηλεκτρολόγων Μηχανικών και Μηχανικών Υπολογιστών. | http://www.ee.duth.gr/en |
| 4. | Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών | Τμήμα Πληροφορικής και Τηλεπικοινωνιών | http://www.di.uoa.gr |
| 5. | Εθνικό Μετσόβειο Πολυτεχνείο | Σχολή Ηλεκτρολόγων Μηχανικών και Μηχανικών Υπολογιστών | http://www.ece.ntua.gr |
| 6. | Ελληνικό Ανοικτό Πανεπιστήμιο | Τμήμα Πληροφορικής | http://www.eap.gr |
| 7. | Οικονομικό Πανεπιστήμιο Αθηνών | Τμήμα Πληροφορικής | http://www.cs.aueb.gr |
| 8. | Πανεπιστήμιο Αιγαίου | Τμήμα Μηχανικών Πληροφοριακών και Επικοινωνιακών Συστημάτων. | http://www.icsd.aegean.gr |
| 9. | Πανεπιστήμιο Δυτικής Μακεδονίας | Τμήμα Μηχανικών Πληροφορικής και Τηλεπικοινωνιών. | http://icte.uowm.gr |
| 10. | Πανεπιστήμιο Θεσσαλίας | Τμήμα Μηχανικών Υπολογιστών, Τηλεπικοινωνιών και Δικτύων. | http://www.inf.uth.gr |
| 11. | Πανεπιστήμιο Ιονίου | Τμήμα Πληροφορικής. | http://di.ionio.gr/en |
| 12. | Πανεπιστήμιο Ιωαννίνων | Τμήμα Πληροφορικής. | http://www.cs.uoi.gr |
| 13. | Πανεπιστήμιο Κρήτης | Τμήμα Επιστήμης Υπολογιστών. | http://www.csd.uoc.gr |
| 14. | Πανεπιστήμιο Μακεδονίας | Τμήμα Εφαρμοσμένης Πληροφορικής. | http://www.uom.gr/index.php?tmima=6&categorymenu=2 |
| 15. | Πανεπιστήμιο Πατρών | Τμήμα Μηχανικών Η/Υ και Πληροφορικής. | https://www.ceid.upatras.gr |
| 16. | Πανεπιστήμιο Πειραιώς | Τμήμα Πληροφορικής. | http://www.cs.unipi.gr/index.php?lang=en |
| 17. | Πανεπιστήμιο Στερεάς Ελλάδας | Τμήμα Πληροφορικής με Εφαρμογές στην Βιοϊατρική. | http://www.dib.uth.gr |
| 18. | Πολυτεχνείο Κρήτης | Τμήμα Ηλεκτρονικών Μηχανικών και Μηχανικών Υπολογιστών. | http://www.ece.tuc.gr/4101.html |
| 19. | Χαροκόπειο Πανεπιστήμιο | Τμήμα Πληροφορικής και Τηλεματικής. | http://www.dit.hua.gr/index.php/en |

| *Table A7a. Informatics institutions in Ireland - Universities* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | University College Dublin | School of Computer Science and Informatics | http://www.csi.ucd.ie |
| 2. | University College Cork | Department of Computer Science | http://www.ucc.ie/en/compsci |
| 3. | National University of Ireland, Galway | College of Engineering and Informatics | http://www.nuigalway.ie/engineering-informatics |
| 4. | National University of Ireland, Maynooth | Department of Computer Science | http://www.nuim.ie/computer-science |
| 5. | University of Limerick | Department of Computer Science & Information Systems | http://www.csis.ul.ie |
| 6. | Trinity College, Dublin | School of Computer Science & Statistics (SCSS) | https://www.cs.tcd.ie |
| 7. | Dublin City University | School of Computing | http://www.dcu.ie/computing/index.shtml |

| *Table A7b. Informatics institutions in Ireland – Institutes of Technology* | | | |
|---|---|---|---|
| | ***Institute of Technology*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | Dublin Institute of Technology | School of Computing | http://www.dit.ie/computing |
| 2. | Athlone Institute of Technology | Department Electronics, Computer and Software Engineering | http://www.ait.ie/engineering/deptofelectronicscomputersoftwareeng |
| 3. | Cork Institute of Technology | Department of Computing | http://computing.cit.ie |
| 4. | Dundalk Institute of Technology | Department of Computing and Mathematics | https://www.dkit.ie/informatics-creative-arts/computing-mathematics |
| 5. | Dun Laoghaire Institute of Art, Design and Technology | Faculty of Film, Art & Creative Technologies | http://www.iadt.ie/en/ProspectiveStudents/FacultiesCourses/FacultyofFilmArtCreativeTechnologies |
| 6. | Galway-Mayo Institute of Technology | Department of Mathematics and Computing | http://www.gmit.ie/computing/department-mathematics-and-computing |
| 7. | Institute of Technology, Blanchardstown | Computing | http://www.itb.ie/StudyatITB/computing.html |
| 8. | Institute of Technology, Carlow | Computing & Networking | http://www.itcarlow.ie/study-at-itc/science/computing-networking.htm |
| 9. | Institute of Technology, Sligo | Computing | http://courses.itsligo.ie/engineering-and-design/computing |
| 10. | Institute of Technology, Tallaght | Department of Computing | http://www.it-tallaght.ie/departmentofcomputing |
| 11. | Institute of Technology, Tralee | Department of Computing | http://www.ittralee.ie/en/InformationAbout/Courses/SchoolofBusinessComputingandHumanities/Computing |
| 12. | Letterkenny Institute of Technology | Department of Computing | http://www.lyit.ie/full-timecourses/computing |
| 13. | Limerick Institute of Technology | Department of Information Technology | http://www.lit.ie/ASET/IT/default.aspx |
| 14. | Limerick Institute of Technology Tipperary | Department of Technology | http://www.lit.ie/Tipperary/Technology/default.aspx |
| 15. | Waterford Institute of Technology | Department of Computing, Maths & Physics | http://www.wit.ie/schools/science/department_of_computing_maths_physics |

| *Table A8. Informatics institutions in Italy* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | Politecnico di Bari | Dipartimento di Ingegneria Elettrica e dell'Informazione | http://www-dee.poliba.it/DEE/DEE.html |
| 2. | Università degli Studi di Bari "Aldo Moro" | Dipartimento di Informatica | http://www.di.uniba.it |
| 3. | Università degli Studi della Basilicata | Dipartimento di Matematica, Informatica ed Economia | http://dimie.unibas.it/site/home.html |
| 4. | Alma Mater Studiorum – Università di Bologna | Dipartimento di Informatica – Scienza e Ingegneria | http://www.cse.unibo.it |
| 5. | Libera Università di Bolzano | Facoltà di Scienze e Tecnologie Informatiche | http://www.unibz.it/it/inf |
| 6. | Università degli Studi di Brescia | Dipartimento di Ingegneria dell'Informazione | http://www.unibs.it/dipartimenti/ingegneria-dell'informazione |
| 7. | Università degli Studi di Cagliari | Dipartimento di Matematica e Informatica | http://dipartimenti.unica.it/matematicaeinformatica/ |
| 8. | Università degli Studi di Cagliari | Dipartimento di Ingegneria Elettrica e Elettronica | http://dipartimenti.unica.it/ingegneriaelettricaedelettronica |
| 9. | Università della Calabria | Dipartimento di Ingegneria Informatica, Modellistica, Elettronica e Sistemistica | http://www.dimes.unical.it |
| 10. | Università della Calabria | Dipartimento di Matematica e Informatica | http://www.mat.unical.it |
| 11. | Università degli Studi di Cassino e del Lazio Meridionale | Dipartimento di Ingegneria Elettrica e dell'Informazione "Maurizio Scarano" | http://www.dipartimenti.unicas.it/Dipartimento-di-Ingegneria-elettrica-e-dell-informazione-Maurizio-Scarano |
| 12. | Università degli Studi di Catania | Dipartimento di Ingegneria Elettrica Elettronica e Informatica | http://www.dieei.unict.it |
| 13. | Università degli Studi di Catania | Dipartimento di Matematica e Informatica | http://web.dmi.unict.it |
| 14. | Università degli Studi di Ferrara | Dipartimento di Ingegneria | http://ing.unife.it |
| 15. | Università degli Studi di Ferrara | Dipartimento di Matematica e informatica | http://dmi.unife.it |
| 16. | Università degli Studi di Firenze | Dipartimento di Ingegneria dell'Informazione | http://www.dinfo.unifi.it |
| 17. | Università degli Studi di Firenze | Dipartimento di Matematica e Informatica | http://www.dimai.unifi.it |
| 18. | Università degli Studi di Firenze | Dipartimento di Statistica, Informatica, Applicazioni | http://www.disia.unifi.it |
| 19. | Università degli Studi di Genova | Dipartimento di Informatica, bioingegneria,robotica e ingegneria dei sistemi | http://www.dibris.unige.it |
| 20. | Università degli Studi dell'Insubria | Dipartimento di Scienze Teoriche e Applicate | http://informatica.dista.uninsubria.it |
| 21. | Università degli Studi de L'aquila | Dipartimento di Ingegneria e Scienze dell'Informazione e Matematica | http://www.disim.univaq.it |
| 22. | Università degli Studi de L'aquila | Dipartimento di Ingegneria Industriale e dell'Informazione e di Economia | http://www.diiie.univaq.it |
| 23. | IMT Institute for Advanced Studies di Lucca | Computer Science and Applications | http://www.imtlucca.it |

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| 24. Università degli Studi di Messina | Dipartimento di Ingegneria Civile, Informatica, Edile, Ambientale e Matematica Applicata | http://www.dmi.unime.it |
| 25. Politecnico di Milano | Dipartimento di Elettronica, Informazione e Bioingegneria | http://www.deib.polimi.it |
| 26. Università degli Studi di Milano | Dipartimento di Informatica | http://www.di.unimi.it |
| 27. Università degli Studi di Milano-Bicocca | Dipartimento di Informatica, Sistemistica e Comunicazione | http://www.disco.unimib.it |
| 28. Università Politecnica delle Marche | Dipartimento di Ingegneria dell'Informazione | http://www.dii.univpm.it |
| 29. Università degli Studi di Modena e Reggio Emilia | Dipartimento di Ingegneria "Enzo Ferrari" | http://www.ingmo.unimore.it |
| 30. Università degli Studi di Modena e Reggio Emilia | Dipartimento di Scienze fisiche, informatiche e matematiche | http://www.fim.unimore.it |
| 31. Università degli Studi di Napoli "Federico II" | Dipartimento di Ingegneria Elettrica e delle Tecnologie dell'Informazione | http://www.dieti.unina.it |
| 32. Seconda Università degli Studi di Napoli | Dipartimento di Ingegneria Industriale e dell'Informazione | http://www.diii.unina2.it |
| 33. Università degli Studi di Napoli "Parthenope" | Dipartimento di Scienze e Tecnologie | http://informatica.uniparthenope.it |
| 34. Università degli Studi di Padova | Dipartimento di Ingegneria dell'Informazione | http://www.dei.unipd.it |
| 35. Università degli Studi di Padova | Dipartimento di Matematica | http://informatica.math.unipd.it/ |
| 36. Università degli Studi di Palermo | Dipartimento di Ingegneria Chimica, Gestionale, Informatica, Meccanica | http://www.dicgim.unipa.it |
| 37. Università degli Studi di Palermo | Dipartimento di Matematica e Informatica | http://portale.unipa.it/dipartimenti/dimaticaeinformatica |
| 38. Università degli Studi di Parma | Dipartimento di Ingegneria dell'Informazione | http://www.dii.unipr.it |
| 39. Università degli Studi di Parma | Dipartimento di Matematica e Informatica | http://www.dmi.unipr.it |
| 40. Università degli Studi di Pavia | Dipartimento di Ingegneria Industriale e dell'Informazione | http://iii.unipv.it |
| 41. Università degli Studi di PERUGIA | Dipartimento di Ingegneria Elettronica e dell'informazione | http://www.diei.unipg.it |
| 42. Università degli Studi di Perugia | Dipartimento di Matematica e Informatica | http://dmi.unipg.it |
| 43. Università degli Studi del Piemonte Orientale "Amedeo Avogadro" | Dipartimento di Scienze e Innovazione Tecnologica – Istituto di Informatica | http://www.di.unipmn.it |
| 44. Università di Pisa | Dipartimento di Informatica | http://www.di.unipi.it |
| 45. Università di Pisa | Dipartimento di Ingegneria dell'Informazione | http://ce.iet.unipi.it |
| 46. Università degli Studi "Mediterranea" di Reggio Calabria | Dipartimento di Ingegneria dell'Informazione, delle Infrastrutture e dell'Energia Sostenibile | http://www.diies.unirc.it |
| 47. Sapienza – Università di Roma | Dipartimento di Informatica | http://w3.di.uniroma1.it |
| 48. Sapienza – Università di Roma | Dipartimento di Ingegneria Informatica, Automatica e Gestionale "Antonio Ruberti" | http://www.diag.uniroma1.it |

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| 49. Università degli Studi di Roma "Tor Vergata" | Dipartimento di Ingegneria Civile e Ingegneria Informatica | http://www.dicii.uniroma2.it |
| 50. Università degli Studi di Roma "Tor Vergata" | Dipartimento di Ingegneria dell'Impresa | http://www.uniroma2.it |
| 51. Università degli Studi di Roma "Roma Tre" | Dipartimento di Ingegneria | http://ingegneria.uniroma3.it |
| 52. Università degli Studi del Salento | Dipartimento di Ingegneria dell'Innovazione | http://www.dii.unisalento.it |
| 53. Università degli Studi di Salerno | Dipartimento di Informatica | http://www.di.unisa.it |
| 54. Università degli Studi di Salerno | Dipartimento di Ingegneria dell'Informazione, Ingegneria Elettrica e Matematica Applicata | http://www.diem.unisa.it |
| 55. Università degli Studi di Salerno | Dipartimento di Studi e Ricerche Aziendali (Management & Information Technology) | http://www.distra.unisa.it |
| 56. Università degli Studi di Siena | Dipartimento di Ingegneria dell'Informazione e Scienze Matematiche | http://www.unisi.it/dipartimenti/dipartimento-ingegneria-dell%E2%80%99informazione-e-scienze-matematiche |
| 57. Politecnico di Torino | Dipartimento di Automatica e Informatica | http://www.dauin.polito.it |
| 58. Università degli Studi di Torino | Dipartimento di Informatica | http://www.educ.di.unito.it |
| 59. Università degli Studi di Trento | Dipartimento di Ingegneria e Scienza dell'Informazione | http://disi.unitn.it |
| 60. Università degli Studi di Trieste | Dipartimento di Ingegneria e Architettura | http://www.dicar.units.it/dia |
| 61. Università degli Studi di Udine | Dipartimento di Matematica e Informatica | http://www.dimi.uniud.it |
| 62. Università degli Studi di Urbino | Dipartimento di Scienze di Base e Fondamenti – Sezione di Scienze e Tecnologie dell'Informazione | http://informatica.uniurb.it |
| 63. Università "Cà Foscari" Venezia | Dipartimento di Scienze Ambientali, Informatica e Statistica | http://www.unive.it/dais |
| 64. Università degli Studi di Verona | Dipartimento di Informatica | http://www.di.univr.it |

| *Table A9. Informatics institutions in Latvia* | | |
|---|---|---|
| ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. Rīgas Tehniskā universitāte | Datorzinātnes un informācijas tehnoloģijas fakultāte | http://www.ditf.rtu.lv |
| 2. Rīgas Tehniskā universitāte | Elektronikas un telekomunikāciju fakultāte | http://www.etf.rtu.lv |
| 3. Latvijas Universitāte | Datorikas fakultāte | http://www.df.lu.lv |
| 4. Latvijas Lauksaimniecības universitāte | Informācijas tehnoloģiju fakultāte | http://www.itf.llu.lv |
| 5. Daugavpils Universitāte | Dabaszinātņu un matemātikas fakultāte | http://www.du.lv/lv/fakultates/dmf |
| 6. Liepājas Universitāte | Dabas un inženierzinātņu fakultāte | http://dif.liepu.lv |
| 7. Transporta un sakaru institūts | Datorzinātņu un telekomunikāciju fakultāte | http://www.tsi.lv/lv/content/datorzinatnu-un-telekomunikaciju-fakultate |
| 8. Ventspils Augstskola | Informācijas tehnoloģiju fakultāte | http://venta.lv/studijas/informacijas-tehnologiju-fakultate/studiju-informacija |
| 9. Vidzemes Augstskola | Inženierzinātņu fakultāte | http://www.va.lv/lv/lapa/inzenierzinatnu-fakultate |
| 10. Rēzeknes Augstskola | Inženieru fakultāte | http://www.ru.lv/fakultates/inzenieru_fakultate |
| 11. Informācijas sistēmu menedžmenta augstskola | Dabas zinātņu un datoru tehnoloģiju katedra | http://www.isma.lv/lv/katedras-un-noda-as/10-katedras-un-noda-as/93-dabaszin-t-u-un-datoru-tehnolo-iju-katedra |
| 12. Baltijas Starptautiskā akadēmija | - | http://bsa.edu.lv |
| 13. Ekonomikas un kultūras augstskola | - | http://www.eka.edu.lv |
| 14. Eiropas Tālmācības augstskola | - | http://www.distance-learning.com/# |

| *Table A10a. Informatics institutions in the Netherlands – Universities* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | Radboud Universiteit Nijmegen | Onderwijsinstituut voor Informatica en Informatiekunde | http://www.ru.nl/oii/ |
| 2. | Rijksuniversiteit Groningen | Johann Bernoulli instituut | http://www.rug.nl/fmns-research/bernoulli/index |
| 3. | Technische Universiteit Delft | Faculteit Elektrotechniek, Wiskunde en Informatica | http://www.ewi.tudelft.nl/en |
| 4. | Technische Universiteit Eindhoven (TU/e) | Faculteit Wiskunde & Informatica | http://w3.win.tue.nl/en |
| 5. | Universiteit Leiden | Leiden Institute of Advanced Computer Science | http://www.liacs.nl |
| 6. | Universiteit Maastricht | Department of Knowledge Engineering | http://www.maastrichtuniversity.nl/web/Schools/DKE.htm |
| 7. | Universiteit Twente | Faculteit Elektrotechniek, Wiskunde en Informatica | http://www.utwente.nl/en/education/eemcs |
| 8. | Universiteit Utrecht | Departement Informatica | http://www.cs.uu.nl |
| 9. | Universiteit van Amsterdam | Instituut voor Informatica | http://www.science.uva.nl/ii/home.cfm |
| 10. | VU Vrije Universiteit Amsterdam | Faculteit Elektrotechniek, Wiskunde en Informatica | http://www.cs.vu.nl/en/index.asp |

| *Table A10b. Informatics institutions in the Netherlands – Universities of Applied Sciences* | | |
|---|---|---|
| | ***University of Applied Science*** | ***Website*** |
| 1. | Avans Hogeschool | http://www.avans.nl |
| 2. | De Haagse Hogeschool | http://www.hhs.nl |
| 3. | Fontys Hogescholen | http://www.fontys.nl |
| 4. | Hanzehogeschool Groningen | http://www.hanze.nl |
| 5. | Hogeschool Inholland | http://www.inholland.nl |
| 6. | Hogeschool Leiden | http://www.hsleiden.nl |
| 7. | Hogeschool Rotterdam | http://www.hr.nl |
| 8. | Hogeschool Utrecht | http://www.hu.nl |
| 9. | Hogeschool van Amsterdam | http://www.hva.nl |
| 10. | Hogeschool van Arnhem en Nijmegen | http://www.han.nl |
| 11. | Hogeschool Windesheim | http://www.windesheim.nl |
| 12. | Hogeschool Windesheim Flevoland | http://www.windesheimflevoland.nl |
| 13. | Hogeschool Zeeland | http://www.hz.nl |
| 14. | Hogeschool Zuyd | http://www.zuyd.nl |
| 15. | Noordelijke Hogeschool Leeuwarden | http://www.nhl.nl |
| 16. | Saxion Hogescholen | http://www.saxion.nl |
| 17. | Stenden Hogeschool | http://www.stenden.com |

| *Table A11a. Informatics institutions in Romania – Universities* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | Academia de Studii Economice din București | Facultatea de Cibernetică, Statistică și Informatică Economică | http://www.ase.ro |
| 2. | Universitatea A.I. Cuza Iași | Facultatea de Informatică | http://www.infoiasi.ro |
| 3. | Universitatea A.I. Cuza Iași | Facultatea de Stiințe Economice și Gestiunea Afacerilor | http://www.feaa.uaic.ro |
| 4. | Universitatea Babeș-Bolyai Cluj-Napoca | Facultatea de Matematică și Informatică | http://www.cs.ubbcluj.ro |
| 5. | Universitatea București | Facultatea de Matematică și Informatică | http://fmi.unibuc.ro |
| 6. | Universitatea de Vest Timișoara | Facultatea de Matematică și Informatică | http://www.math.uvt.ro |
| 7. | Universitatea de Vest Timișoara | Facultatea de Economie și Administrarea Afacerilor | http://www.feaa.uvt.ro |
| 8. | Universitatea din Craiova | Facultatea de Științe | http://stiinte.ucv.ro |
| 9. | Universitatea din Petroșani | Facultatea de Inginerie Mecanică și Electrică | http://www.upet.ro/facime |
| 10. | Universitatea din Pitești | Facultatea de Electronică, Comunicații și Calculatoare | http://www.upit.ro |
| 11. | Universitatea Petru Maior Târgu Mures | Facultatea de Științe și Litere | http://cs.upm.ro |
| 12. | Universitatea Politehnica București | Facultatea de Automatică și Calculatoare | http://acs.pub.ro |
| 13. | Universitatea Politehnica Timișoara | Facultatea de Automatică și Calculatoare | http://www.ac.upt.ro |
| 14. | Universitatea Tehnică "Gheorghe Asachi" Iași | Facultatea de Automatică și Calculatoare | http://www.ace.tuiasi.ro |
| 15. | Universitatea Tehnică Cluj-Napoca | Facultatea de Automatică și Calculatoare | http://www.cs.utcluj.ro |

| *Table A12. Informatics institutions in Spain* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | Mondragón Unibertsitatea | Escuela Politécnica Superior | http://www.mondragon.edu/es/eps |
| 2. | Universidad a Distancia de Madrid | Escuela de Ciencias Técnicas e Ingeniería | http://www.udima.es/es/facultades.html#escuela-ciencias-tecnicas-ingenieria |
| 3. | Universidad Alfonso X El Sabio | Escuela Politécnica Superior | http://www.uax.es/que-estudiar/ingenierias-y-licenciaturas/escuela-politecnica-superior.html |
| 4. | Universidad Antonio de Nebrija | Escuela Politécnica Superior | www.nebrija.com/la_universidad/facultades/escuela-politecnica-superior-arquitectura/index.htm |
| 5. | Universidad Autónoma de Madrid | Escuela Politécnica Superior | http://www.ii.uam.es |
| 6. | Universidad Camilo José Cela | Centro Universitario de Tecnología y Arte Digital (U-Tad) | http://www.u-tad.com |
| 7. | Universidad Carlos III de Madrid | Escuela Politécnica Superior | http://www.uc3m.es/ss/Satellite/UC3MInstitucional/es/PortadaMiniSiteC/1371212023390/ |
| 8. | Universidad Católica Santa Teresa de Jesús de Ávila | Facultad de Ciencias y Artes | https://www.ucavila.es/index.php?option=com_content&view=article&id=1273&Itemid=354&lang=es |

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| 9. Universidad Complutense de Madrid | Facultad de Informática | http://www.fdi.ucm.es |
| 10. Universidad de A Coruña | Facultad de Informática | http://www.fic.udc.es |
| 11. Universidad de Alcalá | Escuela Politécnica Superior | http://portal.uah.es/portal/page/portal/politecnica |
| 12. Universidad de Alicante | Escuela Politécnica Superior | http://www.eps.ua.es |
| 13. Universidad de Almería | Escuela Politécnica Superior | http://cms.ual.es/UAL/universidad/centros/esi/index.htm |
| 14. Universidad de Burgos | Escuela Politécnica Superior | http://www.ubu.es/ubu/cm/eps |
| 15. Universidad de Cádiz | Escuela Superior de Ingeniería | http://www.uca.es/esingenieria |
| 16. Universidad de Cantabria | Facultad de Ciencias | http://www.unican.es/Centros/ciencias |
| 17. Universidad de Castilla-La Mancha | Escuela Superior de Informática | http://webpub.esi.uclm.es |
| 18. Universidad de Castilla-La Mancha | Escuela Superior de Ingeniería Informática | http://www.esiiab.uclm.es |
| 19. Universidad de Córdoba | Escuela Politécnica Superior de Córdoba | http://www.uco.es/eps |
| 20. Universidad de Deusto | Facultad de Ingeniería | www.ingenieria.deusto.es |
| 21. Universidad de Extremadura | Escuela Politécnica (Cáceres) | http://epcc.unex.es |
| 22. Universidad de Granada | Escuela Técnica Superior de Ingenierías Informática y de Telecomunicación | http://etsiit.ugr.es |
| 23. Universidad de Granada | Facultad de Educación, Economía y Tecnología de Ceuta | http://fehceuta.ugr.es |
| 24. Universidad de Huelva | Escuela Técnica Superior de Ingeniería | http://www.uhu.es/etsi |
| 25. Universidad de Jaén | Escuela Politécnica Superior (Jaén) | http://eps.ujaen.es |
| 26. Universidad de La Laguna | Escuela Superior de Ingeniería y Tecnología | http://www.ull.es/view/centros/escuelatecnologia/Inicio/es |
| 27. Universidad de La Rioja | Facultad de Ciencias, Estudios Agroalimentarios e Informática | http://www.unirioja.es/facultades_escuelas/fceai/index.shtml |
| 28. Universidad de Las Palmas de Gran Canaria | Escuela de Ingeniería Informática | http://www.eii.ulpgc.es |
| 29. Universidad de León | Escuela de Ingenierías Industrial e Informática | http://centros.unileon.es/eiii |
| 30. Universidad de Málaga | Escuela Técnica Superior en Ingeniería Informática | http://www.informatica.uma.es |
| 31. Universidad de Murcia | Facultad de Informática | http://www.um.es/informatica/index.php |
| 32. Universidad de Oviedo | Escuela de Ingeniería Informática | https://ingenieriainformatica.uniovi.es |
| 33. Universidad de Salamanca | Facultad de Ciencias | http://fciencias.usal.es |
| 34. Universidad de Salamanca | Escuela Politécnica Superior de Zamora | http://poliz.usal.es/politecnica/v1r00 |
| 35. Universidad de Santiago de Compostela | Escuela Técnica Superior de Ingeniería | http://www.usc.es/etse |
| 36. Universidad de Sevilla | Escuela Técnica Superior de Ingeniería Informática | http://www.informatica.us.es |
| 37. Universidad de Valladolid | Escuela de Ingeniería de Informática | http://www.fi.uva.es |
| 38. Universidad de Valladolid | Escuela de Ingeniería Informática de Segovia | http://www.eui.uva.es |
| 39. Universidad de Vigo | Escuela Superior de Ingeniería Informática | http://www.esei.uvigo.es |
| 40. Universidad de Zaragoza | Escuela de Ingeniería y Arquitectura | https://eina.unizar.es |

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| 41. | Universidad de Zaragoza | Escuela Universitaria Politécnica (Teruel) | http://eupt.unizar.es |
| 42. | Universidad del País Vasco/Euskal Herriko Unibertsitatea | Facultad de Informática | http://www.informatika.ehu.es/p248-home/es |
| 43. | Universidad del País Vasco/Euskal Herriko Unibertsitatea | Escuela Universitaria de Ingeniería de Vitoria-Gasteiz | http://www.ingeniaritza-gasteiz.ehu.es/p232-home/es |
| 44. | Universidad del País Vasco/Euskal Herriko Unibertsitatea | Escuela Universitaria de Ingeniería Técnica Industrial de Bilbao | http://www.ehu.eus/es/web/ingenieria-tecnica-bilbao/home |
| 45. | Universidad Europea de Madrid | Escuela de Arquitectura, Ingeniería y diseño | http://politecnica.uem.es |
| 46. | Universidad Europea Miguel de Cervantes | Escuela Politécnica Superior | http://www.uemc.es/es/Centros/eps/Paginas/default.aspx |
| 47. | Universidad Francisco de Vitoria | Escuela Politécnica Superior | http://www.ufv.es/grado-en-ingenieria-informatica |
| 48. | Universidad internacional de La Rioja | Escuela Superior de Ingeniería y Tecnología | http://ingenieria.unir.net |
| 49. | Universidad Internacional Isabel I de Castilla | Facultad de Ciencias y Tecnología | http://www.ui1.es/oferta-academica/por-areas#anchor-tecnologia |
| 50. | Universidad Miguel Hernández de Elche | Escuela Politécnica Superior de Elche | http://epse.umh.es |
| 51. | Universidad Nacional de Educación a Distancia | Escuela Técnica Superior de Ingeniería Informática | http://www.ii.uned.es |
| 52. | Universidad Pablo de Olavide | Escuela Politécnica Superior | http://www.upo.es/eps |
| 53. | Universitat Autònoma de Barcelona | Escola d'Enginyeria | http://www.uab.cat/escola-enginyeria |
| 54. | Universitat Autònoma de Barcelona | Escola Universitària d'Informàtica Tomàs Cerdà | http://informatica1.eug.es/es |
| 55. | Universitat de Barcelona | Facultat de Matemàtiques | http://www.mat.ub.edu |
| 56. | Universitat de Girona | Escola Politècnica Superior | http://www.udg.edu/eps/Inici/tabid/1000/language/ca-ES/Default.aspx |
| 57. | Universitat de Lleida | Escola Politècnica Superior | http://www.eps.udl.cat |
| 58. | Universitat Jaume I de Castelló | Escuela Superior de Tecnología y Ciencias Experimentales | http://www.uji.es/ES/centres/estce |
| 59. | Universitat Politècnica de Catalunya | Centre de la Imatge i la Tecnologia Multimedia | http://www.citm.upc.edu/esp |
| 60. | Universitat Politècnica de Catalunya | Escola Politècnica Superior d'Enginyeria de Vilanova i la Geltrú | http://www.epsevg.upc.edu |
| 61. | Universitat Politècnica de Catalunya | Escola Politècnica Superior d'Enginyeria de Manresa | http://www.epsem.upc.edu |
| 62. | Universitat Politècnica de Catalunya | Facultat d'Informàtica de Barcelona | http://www.fib.upc.edu |

| *Table A13a. Informatics institutions in Switzerland – Universities* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| 1. | EPF Lausanne | Faculté Informatique et Communications | http://ic.epfl.ch/page-5735-fr.html |
| 2. | ETH Zürich | Departement Informatik | http://www.inf.ethz.ch |
| 3. | Universität Basel | Departement Mathematik und Informatik | http://dmi.unibas.ch |
| 4. | Universität Bern | Institut für Informatik und Angewandte Mathematik | http://www.iam.unibe.ch |
| 5. | Université de Fribourg / Universität Freiburg | Département d'Informatique / Departement für Informatik | http://diuf.unifr.ch |
| 6. | Université de Genève | Département d'Informatique | http://cui.unige.ch/DI/index.html |
| 7. | Université de Lausanne | Département des Systèmes d'Information (ISI) | http://www.hec.unil.ch/isi/home |
| 8. | Université de Neuchatel | Institut d'Informatique (IIUN) | http://www2.unine.ch/iiun/page-5100.html |
| 9. | Università della Svizzera Italiana | Facoltà di Scienze Informatiche | http://www.inf.usi.ch/it/index.htm |
| 10. | Universität Zurich | Institut für Informatik | http://www.ifi.uzh.ch |

| *Table A13b. Informatics institutions in Switzerland – Universities of Applied Sciences* | | |
|---|---|---|
| | ***University of Applied Sciences*** | ***Website*** |
| 1. | Berner Fachhochschule (BFH) | www.bfh.ch |
| 2. | Fachhochschule Kalaidos (FH KAL) | www.kalaidos-fh.ch |
| 3. | Fachhochschule Nordwestschweiz (FHNW) | www.fhnw.ch |
| 4. | Fachhochschule Ostschweiz (FHO) | www.fho.ch |
| 5. | Haute Ecole Spécialisée de Suisse occidentale (HES-SO) | www.hes-so.ch |
| 6. | Hochschule Luzern (HSLU) | www.hslu.ch |
| 7. | Scuola universitaria professionale della Svizzera italiana (SUPSI) | www.supsi.ch |
| 8. | Zürcher Fachhochschule (ZFH) | www.zfh.ch |

| *Table A14. Informatics institutions in the UK* | | | |
|---|---|---|---|
| | ***University*** | ***Department/Faculty/School/Institute*** | ***Website*** |
| **England** | | | |
| 1. | Anglia Ruskin University | Department of Computing and Technology | http://www.anglia.ac.uk/ruskin/en/home/faculties/fst/departments/comptech.html |
| 2. | Aston University | Computer Science | http://www.cs.aston.ac.uk |
| 3. | Birmingham City University | School of Computing, Telecommunications and Networks | http://www.bcu.ac.uk/about-us/faculties/faculty-of-technology-engineering-and-the-environment |
| 4. | Bournemouth University | School of Design, Engineering and Computing | http://dec.bournemouth.ac.uk |
| 5. | Brunel University | School of IS, Computing and Mathematics | http://www.brunel.ac.uk/about/acad/siscm |
| 6. | Canterbury Christ Church University | Department of Computing | http://www.canterbury.ac.uk/social-applied-sciences/computing/Home.aspx |
| 7. | The City University | School of Informatics | http://www.city.ac.uk/informatics |
| 8. | Coventry University | Faculty of Engineering and Computing | http://www.mis.coventry.ac.uk |
| 9. | Cranfield University | Department of Informatics and Systems Engineering | http://www.cranfield.ac.uk/cds/departments/dise/index.html |
| 10. | De Montfort University | School of Computer Science and Informatics | http://www.dmu.ac.uk/about-dmu/schools-and-departments/school-of-computer-science-and-informatics |
| 11. | De Montfort University | The Institute of Creative Technologies | http://www.ioct.dmu.ac.uk |
| 12. | Keele University | School of Computing and Mathematics | http://www.scm.keele.ac.uk |
| 13. | Kingston University | Faculty of Science, Engineering and Computing. | http://cism.kingston.ac.uk |
| 14. | Leeds Metropolitan University | School of Computing & Creative Technologies | http://www.leedsmet.ac.uk/aet/- computing-creative-technologies |
| 15. | The University of Leeds | School of Computing | http://www.engineering.leeds.ac.uk/comp |
| 16. | Liverpool Hope University | Department of Mathematics and Computer Science | http://www.hope.ac.uk/mathematicsandcomputerscience |
| 17. | Liverpool John Moores University | School of Computing & Mathematical Sciences | http://www.cms.livjm.ac.uk |
| 18. | London Metropolitan University | School of Computing | http://www.londonmet.ac.uk/depts/cctm |
| 19. | London South Bank University | Computing and Informatics | http://bus.lsbu.ac.uk/courses/undergraduate/computing |
| 20. | Birkbeck College | Department of Computer Science and Information Systems | http://www.dcs.bbk.ac.uk |
| 21. | Goldsmiths College | Department of Computing | http://www.goldsmiths.ac.uk/computing |
| 22. | Imperial College | Department of Computing | http://www3.imperial.ac.uk/computing |
| 23. | King's College London | Department of Informatics | http://www.kcl.ac.uk/nms/depts/informatics/index.aspx |
| 24. | Queen Mary and Westfield College | School of Electronic Engineering and Computer Science | http://www.dcs.qmul.ac.uk |
| 25. | University College London | Department of Computer Science | http://www.cs.ucl.ac.uk |
| 26. | Loughborough University | Department of Computer Science | http://www.lboro.ac.uk/departments/compsci |

| | | |
|---|---|---|
| 27. The Manchester Metropolitan University | School of Computing, Mathematics and Digital Technology | http://www.docm.mmu.ac.uk |
| 28. Middlesex University | School of Engineering and Information Sciences | http://www.mdx.ac.uk/aboutus/Schools/EIS/index.aspx |
| 29. The University of Newcastle-upon-Tyne | Computing Science | http://www.cs.ncl.ac.uk |
| 30. The University of Northumbria at Newcastle | School of Computing, Engineering & Information Sciences | http://northumbria.ac.uk/sd/academic/ceis |
| 31. The Nottingham Trent University | Computing and Technology | http://www.ntu.ac.uk/sat/about/academic_teams/comp_tech.html |
| 32. The Open University | Faculty of Mathematics, Computing and Technology | http://www.mcs.open.ac.uk |
| 33. Oxford Brookes University | Department of Computing and Communication Technologies | http://cct.brookes.ac.uk |
| 34. Royal Holloway University of London | Department of Computer Science | http://www.rhul.ac.uk/computerscience/home.aspx |
| 35. Sheffield Hallam University | Computing | http://www.shu.ac.uk/computing |
| 36. Southampton Solent University | Technology School | http://www.solent.ac.uk/about-us/faculties/martec/technology-school.aspx |
| 37. Staffordshire University | Faculty of Computing, Engineering and Technology | http://www.staffs.ac.uk/academic/comp_eng_tech |
| 38. Teesside University | School of Computing | http://www-scm.tees.ac.uk |
| 39. University of Bedfordshire | Department of Computer Science and Technology | http://www.beds.ac.uk/departments/computing |
| 40. The University of Bath | Department of Computer Science | http://www.cs.bath.ac.uk/department |
| 41. The University of Birmingham | School of Computer Science | http://www.cs.bham.ac.uk |
| 42. The University of Bolton | Department of Computing and Electronic Technology | http://data.bolton.ac.uk/cet/research |
| 43. The University of Bradford | School of Computing Informatics and Media | http://scim.brad.ac.uk |
| 44. The University of Brighton | School of Computing, Engineering and Mathematics | http://www.brighton.ac.uk/cmis |
| 45. The University of Bristol | Department of Computer Science | http://www.cs.bris.ac.uk |
| 46. The University of Buckingham | Department of Applied Computing | http://www.buckingham.ac.uk/appliedcomputing |
| 47. The University of Cambridge | Computer Laboratory | http://www.cl.cam.ac.uk |
| 48. The University of Central Lancashire | Computing, Engineering and Physical Sciences | http://www.uclan.ac.uk/scitech/computing_engineering_physical/index.php |
| 49. University of Chester | School of Computer Science, Mathematics and Business Computing | http://www.chester.ac.uk/csis |
| 50. University of Derby | School of Computing and Mathematics | http://www.derby.ac.uk/computing |
| 51. University of Durham | School of Computing Science | http://www.dur.ac.uk/computer.science |
| 52. The University of East Anglia | School of Computing and Technology | http://www1.uea.ac.uk/cm/home/schools/sci/computing |
| 53. The University of East London | School of Architecture, Computing and Engineering | http://www.uel.ac.uk/ace |

| | | |
|---|---|---|
| 54. The University of Essex | Department of Computing, Engineering and Mathematics | http://www.essex.ac.uk/dces |
| 55. The University of Exeter | Faculty of Advanced Technology | http://www.secam.ex.ac.uk |
| 56. University of Gloucestershire | School of Computing and Mathematical Sciences | http://www.glos.ac.uk/faculties/bs/Pages/default.aspx |
| 57. The University of Greenwich | School of Computer Sciences | http://www.cms.gre.ac.uk |
| 58. University of Hertfordshire | School of Computing and Engineering | http://www.herts.ac.uk/cs |
| 59. The University of Huddersfield | School of Computing and Engineering | http://www.hud.ac.uk/ce |
| 60. The University of Hull | Computing Laboratory | http://www.net.dcs.hull.ac.uk/index.htm |
| 61. The University of Kent | Computing Department | http://www.cs.kent.ac.uk |
| 62. The University of Lancaster | School of Computing | http://www.comp.lancs.ac.uk |
| 63. The University of Leicester | Department of Computing and Informatics | http://www.cs.le.ac.uk |
| 64. The University of Lincoln | The Lincoln School of Computer Science | http://www.lincoln.ac.uk/dci |
| 65. The University of Liverpool | School of Computer Science | http://www.csc.liv.ac.uk |
| 66. The University of Manchester | School of Computing Science | http://www.cs.manchester.ac.uk |
| 67. The University of Northampton | School of Computing, Engineering and Information Sciences | http://www2.northampton.ac.uk/appliedsciences/appliedscience/computing |
| 68. The University of Nottingham | Computing Laboratory | http://www.nottingham.ac.uk/cs |
| 69. The University of Oxford | School of Computing | http://web.comlab.ox.ac.uk/oucl |
| 70. The University of Plymouth | School of Computing and Mathematics | http://www.plymouth.ac.uk/pages/view.asp?page=7491 |
| 71. The University of Portsmouth | Department of Creative Technologies | http://www.ceetee.net |
| 72. The University of Portsmouth | School of Computing | http://www.port.ac.uk/departments/academic/comp |
| 73. The University of Reading | School of Computing Science and Engineering | http://www.sse.reading.ac.uk |
| 74. The University of Salford | School of Computing Science and Engineering | http://www.cse.salford.ac.uk |
| 75. The University of Sheffield | Electronics and Computer Science | http://www.shef.ac.uk/dcs |
| 76. The University of Southampton | School of Computer Science | http://www.ecs.soton.ac.uk |
| 77. The University of Sunderland | Department of Computing | http://www.cat.sunderland.ac.uk |
| 78. The University of Surrey | Department of Computing | http://www.cs.surrey.ac.uk |
| 79. The University of Sussex | School of Informatics | http://www.sussex.ac.uk/informatics |
| 80. The University of Warwick | Department of Computer Science | http://www.dcs.warwick.ac.uk |
| 81. University of the West of England, Bristol | Faculty of Computing and Engineering | http://www.uwe.ac.uk/cems |
| 82. The University of West London | School of Computing and Technology | http://www.uwl.ac.uk/computing/School_of_Computing_and_Technology.jsp |

| | | |
|---|---|---|
| 83. The University of Westminster | School of Electronics and Computer Science | http://www.westminster.ac.uk/schools/computing |
| 84. The University of Wolverhampton | Department of Computer Science | http://www.scit.wlv.ac.uk |
| 85. The University of York | Department of Computer Science | http://www.cs.york.ac.uk/public.php |
| **Wales** | | |
| 86. Aberystwyth University | Department of Computer Science | http://www.aber.ac.uk/compsci/public |
| 87. Bangor University | School of Computer Science | http://www.cs.bangor.ac.uk |
| 88. Cardiff University | School of Computer Science & Informatics | http://www.cs.cardiff.ac.uk |
| 89. University of Glamorgan | Computing | http://fat.glam.ac.uk/subjects/computing |
| 90. Glyndŵr University | Computing | http://www.glyndwr.ac.uk/en/UniversityInstitutes/ArtsScienceandTechnology/Computing |
| 91. Swansea Metropolitan University | School of Applied Computing | http://www.smu.ac.uk/index.php/potential-students/faculty-of-applied-design-and-engineering/ac |
| 92. Swansea University | Department of Computer Science | http://www.swan.ac.uk/compsci |
| **Scotland** | | |
| 93. The University of Aberdeen | Department of Computing Science | http://www.csd.abdn.ac.uk/index.php |
| 94. University of Abertay | School of Computing and Engineering Systems | http://www.abertay.ac.uk/studying/schools/ces |
| 95. The University of Dundee | School of Computing | http://www.computing.dundee.ac.uk |
| 96. Edinburgh Napier University | School of Computing<br>Institute for Informatics and Digital Innovation | http://www.soc.napier.ac.uk<br>http://www.iidi.napier.ac.uk |
| 97. The University of Edinburgh | School of Informatics | http://www.inf.ed.ac.uk |
| 98. Glasgow Caledonian University | School of Engineering and Built Environment | http://www.caledonian.ac.uk/sec |
| 99. The University of Glasgow | School of Computing Science | http://www.dcs.gla.ac.uk |
| 100. Heriot-Watt University | Department of Computer Science | http://www.macs.hw.ac.uk/cs |
| 101. The Robert Gordon University | School of Computing Science and Digital Media | http://www.rgu.ac.uk/computing |
| 102. The University of St Andrews | School of Computer Science | http://www.cs.st-andrews.ac.uk |
| 103. The University of Stirling | Computing Science and Mathematics | http://www.cs.stir.ac.uk |
| 104. The University of Strathclyde | Department of Computer and Information Sciences | http://www.strath.ac.uk/cis |
| 105. The University of the West of Scotland | School of Computing | http://www.uws.ac.uk/schools/school-of-computing |
| **Northern Ireland** | | |
| 106. The Queen's University of Belfast | School of Electronics, Electrical Engineering and Computer Science | http://www.qub.ac.uk/schools/eeecs |
| 107. University of Ulster | Faculty of Computing and Engineering | http://www.compeng.ulster.ac.uk |

# Appendix B: Salary Tables

**Belgium**

***Fig.B1.1***: Salary table Assistant postions, Université catholique de Louvain. Values valid from July 2016.

| anc. | 8L/(020) | assistant (1) | | 8A/(021) | assistant (2) | | 8C/(023) | 1er assistant (3) docteur avec thèse | | anc. |
|---|---|---|---|---|---|---|---|---|---|---|
| | base à 100% | brut annuel indexé | brut mensuel indexé | base à 100% | brut annuel indexé | brut mensuel indexé | base à 100% | brut annuel indexé | brut mensuel indexé | |
| 0 | 21333.13 | 34999.13 | 2916.60 | 23324.59 | 38266.32 | 3188.87 | 29358.99 | 48166.36 | 4013.87 | 0 |
| 1 | 22024.26 | 36133.00 | 3011.09 | 23948.85 | 39290.48 | 3274.21 | 29983.25 | 49190.52 | 4099.21 | 1 |
| 2 | 23406.52 | 38400.74 | 3200.07 | 25197.37 | 41338.81 | 3444.91 | 30607.51 | 50214.68 | 4184.56 | 2 |
| 3 | 23406.52 | 38400.74 | 3200.07 | 25197.37 | 41338.81 | 3444.91 | 31231.77 | 51238.84 | 4269.91 | 3 |
| 4 | 23406.52 | 38400.74 | 3200.07 | 25197.37 | 41338.81 | 3444.91 | 31231.77 | 51238.84 | 4269.91 | 4 |
| 5 | 24699.57 | 40522.11 | 3376.85 | 26156.08 | 42911.66 | 3575.98 | 32324.2 | 53031.08 | 4419.26 | 5 |
| 6 | 24699.57 | 40522.11 | 3376.85 | 26156.08 | 42911.66 | 3575.98 | 32324.2 | 53031.08 | 4419.26 | 6 |
| 7 | 25992.62 | 42643.49 | 3553.63 | 27114.79 | 44484.52 | 3707.05 | 33416.63 | 54823.32 | 4568.62 | 7 |
| 8 | 25992.62 | 42643.49 | 3553.63 | 27114.79 | 44484.52 | 3707.05 | 33416.63 | 54823.32 | 4568.62 | 8 |
| 9 | 27285.67 | 44764.87 | 3730.41 | 28073.50 | 46057.38 | 3838.12 | 34509.06 | 56615.56 | 4717.97 | 9 |
| 10 | 27285.67 | 44764.87 | 3730.41 | 28073.5 | 46057.38 | 3838.12 | 34509.06 | 56615.56 | 4717.97 | 10 |
| 11 | 28578.72 | 46886.25 | 3907.19 | 29032.21 | 47630.24 | 3969.19 | 35601.49 | 58407.80 | 4867.32 | 11 |
| 12 | 28578.72 | 46886.25 | 3907.19 | 29032.21 | 47630.24 | 3969.19 | 35601.49 | 58407.80 | 4867.32 | 12 |
| 13 | 29871.77 | 49007.63 | 4083.97 | 29990.92 | 49203.10 | 4100.26 | 36693.92 | 60200.05 | 5016.68 | 13 |
| 14 | 29871.77 | 49007.63 | 4083.97 | 29990.92 | 49203.10 | 4100.26 | 36693.92 | 60200.05 | 5016.68 | 14 |
| 15 | 31164.82 | 51129.00 | 4260.76 | 31283.97 | 51324.48 | 4277.05 | 37786.35 | 61992.29 | 5166.03 | 15 |
| 16 | 31164.82 | 51129.00 | 4260.76 | 31283.97 | 51324.48 | 4277.05 | 37786.35 | 61992.29 | 5166.03 | 16 |
| 17 | 32457.87 | 53250.38 | 4437.54 | 32577.02 | 53445.86 | 4453.83 | 38878.78 | 63784.53 | 5315.38 | 17 |
| 18 | 32457.87 | 53250.38 | 4437.54 | 32577.02 | 53445.86 | 4453.83 | 38878.78 | 63784.53 | 5315.38 | 18 |
| 19 | 33750.92 | 55371.76 | 4614.32 | 33870.07 | 55567.24 | 4630.61 | 39971.21 | 65576.77 | 5464.74 | 19 |
| 20 | 33750.92 | 55371.76 | 4614.32 | 33870.07 | 55567.24 | 4630.61 | 39971.21 | 65576.77 | 5464.74 | 20 |
| 21 | 35043.97 | 57493.14 | 4791.10 | 35163.12 | 57688.61 | 4807.39 | 41063.64 | 67369.01 | 5614.09 | 21 |
| 22 | 35043.97 | 57493.14 | 4791.10 | 35163.12 | 57688.61 | 4807.39 | 41063.64 | 67369.01 | 5614.09 | 22 |
| 23 | 36337.02 | 59614.52 | 4967.88 | 36456.17 | 59809.99 | 4984.17 | 41063.64 | 67369.01 | 5614.09 | 23 |
| 24 | 36337.02 | 59614.52 | 4967.88 | 36456.17 | 59809.99 | 4984.17 | 41063.64 | 67369.01 | 5614.09 | 24 |
| 25 | 37630.07 | 61735.89 | 5144.66 | 37749.22 | 61931.37 | 5160.95 | 41063.64 | 67369.01 | 5614.09 | 25 |
| 26 | 37630.07 | 61735.89 | 5144.66 | 37749.22 | 61931.37 | 5160.95 | 41063.64 | 67369.01 | 5614.09 | 26 |
| 27 | 37630.07 | 61735.89 | 5144.66 | 37749.22 | 61931.37 | 5160.95 | 41063.64 | 67369.01 | 5614.09 | 27 |
| 28 | 37630.07 | 61735.89 | 5144.66 | 37749.22 | 61931.37 | 5160.95 | 41063.64 | 67369.01 | 5614.09 | 28 |
| 29 | 37630.07 | 61735.89 | 5144.66 | 37749.22 | 61931.37 | 5160.95 | 41063.64 | 67369.01 | 5614.09 | 29 |
| 30 | 37630.07 | 61735.89 | 5144.66 | 37749.22 | 61931.37 | 5160.95 | 41063.64 | 67369.01 | 5614.09 | 30 |

(1) pour le porteur du diplôme de master 60 crédits

(2) pour le porteur du diplôme de licence, de docteur en médecine, chir, acc., de docteur en méd. vétérinaire, d'ir civil, bio-ingénieur, d'un master 120 crédits

***Fig.B1.2***: PhD scholarships and Postdoctoral fellowships, Université catholique de Louvain. Values valid from July 2016.

**MONTANTS DES BOURSES DE FORMATION COMPLEMENTAIRE ET DE DOCTORAT DURANT L'ANNEE 2016**

| Source | Titre | Durée | Diplôme | Code | Montants en euros Brut annuel | Brut mensuel | Net annuel | Net mensuel | Coût annuel | Coût mensuel |
|---|---|---|---|---|---|---|---|---|---|---|
| **BOURSE DE FORMATION COMPLEMENTAIRE (Pas d'ONSS et pas de précompte)** | | | | | | | | | | |
| UCL | Boursier de formation complémentaire | Max. 24 mois | **Master 60 ou équivalent** | B01 | 19.841,04 | **1.653,42** | 19.841,04 | **1.653,42** | 19.841,04 | **1.653,42** |
| | | | **Master 120 ou equivalent** | B02 | 21.960,84 | **1.830,07** | 21.960,84 | **1.830,07** | 21.960,84 | **1.830,07** |
| **BOURSE DE DOCTORAT (Cotisations à l' ONSS et pas de précompte)** | | | | | | | | | | |
| UCL | Boursier de doctorat | Max. 48 mois | **Master 120 ou équiv.** | | | | | | | |
| | | | UE* | B41 | 25.284,00 | **2.107,00** | 21.979,44 | **1.831,62** | 34.072,68 | **2.839,39** |
| | | | Hors UE | B42 | 23.063,40 | **1.921,95** | 21.979,44 | **1.831,62** | 28.508,52 | **2.375,71** |
| | Aspirant UCL | | **Master 120 ou équiv.** | | | | | | | |
| | | | UE* | B61 | 25.882,92 | **2.156,91** | 22.500,00 | **1.875,00** | 34.879,32 | **2.906,61** |
| | | | Hors UE | B62 | 23.609,64 | **1.967,47** | 22.500,00 | **1.875,00** | 29.183,88 | **2.431,99** |

Au 30/04/2015 :
Il s'agit des Etats membres de l'Espace Economique Européen soit :
L'Allemagne, l'Autriche, la Bulgarie, Chypre, la Croatie, le Danemark, l'Espagne, l'Estonie, la Finlande, la France, la Grande-Bretagne, la Grèce, la Hongrie, l'Irlande, l'Islande, l'Italie, la Lettonie, le Liechtenstein, la Lituanie, le Luxembourg, Malte, la Norvège, les Pays-Bas, la Pologne, le Portugal, la Roumanie, la Slovaquie, la Slovénie, la Suède, la République Tchèque et l'Islande
Ainsi que de la Suisse et des Etats avec lesquels la Belgique a conclu une convention de sécurité sociale soit :
L'Algérie, l'Australie, la Bosnie, le Brésil, le Canada et le Québec, le Chili, la République Démocratique du Congo, la Corée du Sud, les Etats Unis, l'Inde, Israël, le Japon, le Kosovo, la Macédoine, le Maroc, le Monténégro, les Philippines, Saint-Marin, la Serbie, la Tunisie, la Turquie et l'Uruguay

* Les montants de 2016 sont restés identiques par rapport à ceux de 2015

**MONTANTS DES BOURSES DE POST-DOCTORAT DURANT L'ANNEE 2016***

| Source | Titre | Durée | Diplôme | Code | Montants en euros Brut annuel | Brut mensuel | Net annuel | Net mensuel | Coût annuel | Coût mensuel |
|---|---|---|---|---|---|---|---|---|---|---|
| **BOURSE DE POST-DOCTORAT (Cotisations à l'ONSS et pas de précompte)** | | | | | | | | | | |
| UCL | Boursier post-doctorat | Max. 36 mois | Docteur avec thèse Ancienneté "0" | | | | | | | |
| | | | UE* | B71 | 30.890,88 | 2.574,24 | 26.853,48 | **2.237,79** | 41.628,55 | **3.469,05** |
| | | | Hors UE | B72 | 28.177,80 | 2.348,15 | 26.853,48 | **2.237,79** | 34.830,58 | **2.902,55** |
| | | | **Ancienneté "2"** | | | | | | | |
| | | | UE* | B73 | 31.906,44 | 2.658,87 | 27.736,32 | **2.311,36** | 42.997,12 | **3.583,09** |
| | | | Hors UE | B74 | 29.104,20 | 2.425,35 | 27.736,32 | **2.311,36** | 35.975,70 | **2.997,98** |
| | | | **Ancienneté "4"** | | | | | | | |
| | | | UE* | B75 | 32.360,52 | 2.696,71 | 28.131,00 | **2.344,25** | 43.609,04 | **3.634,09** |
| | | | Hors UE | B76 | 29.518,32 | 2.459,86 | 28.131,00 | **2.344,25** | 36.487,60 | **3.040,63** |
| | | | **Ancienneté "6"** | | | | | | | |
| | | | UE* | B77 | 33.128,40 | 2.760,70 | 28.798,56 | **2.399,88** | 44.643,83 | **3.720,32** |
| | | | Hors UE | B78 | 30.218,88 | 2.518,24 | 28.798,56 | **2.399,88** | 37.353,56 | **3.112,80** |

Au 30/04/2015 :
Il s'agit des Etats membres de l'Espace Economique Européen soit :
L'Allemagne, l'Autriche, la Bulgarie, Chypre, la Croatie, le Danemark, l'Espagne, l'Estonie, la Finlande, la France, la Grande-Bretagne, la Grèce, la Hongrie, l'Irlande, l'Islande, l'Italie, la Lettonie, le Liechtenstein, la Lituanie, le Luxembourg, Malte, la Norvège, les Pays-Bas, la Pologne, le Portugal, la Roumanie, la Slovaquie, la Slovénie, la Suède, la République Tchèque et l'Islande
Ainsi que de la Suisse et des Etats avec lesquels la Belgique a conclu une convention de sécurité sociale soit :
L'Algérie, l'Australie, la Bosnie, le Brésil, le Canada et le Québec, le Chili, la République Démocratique du Congo, la Corée du Sud, les Etats Unis, l'Inde, Israël, le Japon, le Kosovo, la Macédoine, le Maroc, le Monténégro, les Philippines, Saint-Marin, la Serbie, la Tunisie, la Turquie et l'Uruguay

* Les montants de 2016 sont restés indentiques par rapport à ceux de 2015

***Fig.B1.3***: Salary table professor positions, Université catholique de Louvain. Values valid from July 2016.

**Barèmes académiques indexé indexés :** 1.6406

mise à jour: 01.07.2016

UNIVERSITE CATHOLIQUE DE LOUVAIN
Service du Personnel
1, pl de l'Université
1348 Louvain-la-Neuve

| anc. | professeur ordinaire (011) | | | professeur (012) | | | chargé de cours (013) | | | anc. |
|---|---|---|---|---|---|---|---|---|---|---|
| | base à 100% | brut annuel indexé | brut mensuel indexé | base à 100% | brut annuel indexé | brut mensuel indexé | base à 100% | brut annuel indexé | brut mensuel indexé | |
| | 45,262.40 | 74,257.49 | 6,188.13 | 40,431.94 | 66,332.64 | 5,527.73 | 34,560.95 | 56,700.69 | 4,725.06 | |
| 1 | 45,262.40 | 74,257.49 | 6,188.13 | 40,431.94 | 66,332.64 | 5,527.73 | 34,560.95 | 56,700.69 | 4,725.06 | 1 |
| 2 | 45,262.40 | 74,257.49 | 6,188.13 | 40,431.94 | 66,332.64 | 5,527.73 | 34,560.95 | 56,700.69 | 4,725.06 | 2 |
| 3 | 50,018.51 | 82,060.37 | 6,838.37 | 43,961.87 | 72,123.84 | 6,010.33 | 37,013.35 | 60,724.10 | 5,060.35 | 3 |
| 4 | 50,018.51 | 82,060.37 | 6,838.37 | 43,961.87 | 72,123.84 | 6,010.33 | 37,013.35 | 60,724.10 | 5,060.35 | 4 |
| 5 | 50,018.51 | 82,060.37 | 6,838.37 | 43,961.87 | 72,123.84 | 6,010.33 | 37,013.35 | 60,724.10 | 5,060.35 | 5 |
| 6 | 54,774.62 | 89,863.24 | 7,488.61 | 47,491.80 | 77,915.05 | 6,492.93 | 39,465.75 | 64,747.51 | 5,395.63 | 6 |
| 7 | 54,774.62 | 89,863.24 | 7,488.61 | 47,491.80 | 77,915.05 | 6,492.93 | 39,465.75 | 64,747.51 | 5,395.63 | 7 |
| 8 | 54,774.62 | 89,863.24 | 7,488.61 | 47,491.80 | 77,915.05 | 6,492.93 | 39,465.75 | 64,747.51 | 5,395.63 | 8 |
| 9 | 59,530.73 | 97,666.12 | 8,138.85 | 51,021.73 | 83,706.25 | 6,975.53 | 41,918.15 | 68,770.92 | 5,730.91 | 9 |
| 10 | 59,530.73 | 97,666.12 | 8,138.85 | 51,021.73 | 83,706.25 | 6,975.53 | 41,918.15 | 68,770.92 | 5,730.91 | 10 |
| 11 | 59,530.73 | 97,666.12 | 8,138.85 | 51,021.73 | 83,706.25 | 6,975.53 | 41,918.15 | 68,770.92 | 5,730.91 | 11 |
| 12 | 64,286.84 | 105,468.99 | 8,789.09 | 54,551.66 | 89,497.45 | 7,458.13 | 44,370.55 | 72,794.32 | 6,066.20 | 12 |
| 13 | 64,286.84 | 105,468.99 | 8,789.09 | 54,551.66 | 89,497.45 | 7,458.13 | 44,370.55 | 72,794.32 | 6,066.20 | 13 |
| 14 | 64,286.84 | 105,468.99 | 8,789.09 | 54,551.66 | 89,497.45 | 7,458.13 | 44,370.55 | 72,794.32 | 6,066.20 | 14 |
| 15 | 69,042.95 | 113,271.86 | 9,439.33 | 58,081.59 | 95,288.66 | 7,940.73 | 46,822.95 | 76,817.73 | 6,401.48 | 15 |
| 16 | 69,042.95 | 113,271.86 | 9,439.33 | 58,081.59 | 95,288.66 | 7,940.73 | 46,822.95 | 76,817.73 | 6,401.48 | 16 |
| 17 | 69,042.95 | 113,271.86 | 9,439.33 | 58,081.59 | 95,288.66 | 7,940.73 | 46,822.95 | 76,817.73 | 6,401.48 | 17 |
| 18 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 49,275.35 | 80,841.14 | 6,736.77 | 18 |
| 19 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 49,275.35 | 80,841.14 | 6,736.77 | 19 |
| 20 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 49,275.35 | 80,841.14 | 6,736.77 | 20 |
| 21 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 51,727.75 | 84,864.55 | 7,072.05 | 21 |
| 22 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 51,727.75 | 84,864.55 | 7,072.05 | 22 |
| 23 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 51,727.75 | 84,864.55 | 7,072.05 | 23 |
| 24 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 54,180.15 | 88,887.95 | 7,407.33 | 24 |
| 25 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 54,180.15 | 88,887.95 | 7,407.33 | 25 |
| 26 | 69,042.95 | 113,271.86 | 9,439.33 | 61,611.52 | 101,079.86 | 8,423.33 | 54,180.15 | 88,887.95 | 7,407.33 | 26 |

***Fig.B1.4***: Salary table, professor positions (*zelfstandig academisch personeel (ZAP)*), Universiteit Hasselt. Values valid from July 2016.

ZAP 2016

**BRUTO MAANDLOON**

| | index | index | index | index |
|---|---|---|---|---|
| | 1,6406 | 1,6406 | 1,6406 | 1,6406 |
| **ZAP trede** | **DOCENT 051** | **HOOFDDOC 041** | **HOOGLER. 031** | **GEW.HOOGL. 011** |
| 0 | 4089,79 | 4 683,35 | 5 483,57 | 6 141,97 |
| 1 | 4089,79 | 4 683,35 | 5 483,57 | 6 141,97 |
| 2 | 4089,79 | 4 683,35 | 5 483,57 | 6 141,97 |
| 3 | 4332,13 | 5 017,61 | 5 964,71 | 6 790,23 |
| 4 | 4332,13 | 5 017,61 | 5 964,71 | 6 790,23 |
| 5 | 4332,13 | 5 017,61 | 5 964,71 | 6 790,23 |
| 6 | 4574,47 | 5 351,88 | 6 445,84 | 7 438,49 |
| 7 | 4574,47 | 5 351,88 | 6 445,84 | 7 438,49 |
| 8 | 4574,47 | 5 351,88 | 6 445,84 | 7 438,49 |
| 9 | 4816,81 | 5 686,14 | 6 926,98 | 8 086,76 |
| 10 | 4816,81 | 5 686,14 | 6 926,98 | 8 086,76 |
| 11 | 4816,81 | 5 686,14 | 6 926,98 | 8 086,76 |
| 12 | 5059,15 | 6 020,41 | 7 408,12 | 8 735,02 |
| 13 | 5059,15 | 6 020,41 | 7 408,12 | 8 735,02 |
| 14 | 5059,15 | 6 020,41 | 7 408,12 | 8 735,02 |
| 15 | 5301,49 | 6 354,68 | 7 889,26 | 9 383,29 |
| 16 | 5301,49 | 6 354,68 | 7 889,26 | 9 383,29 |
| 17 | 5301,49 | 6 354,68 | 7 889,26 | 9 383,29 |
| 18 | 5543,83 | 6 688,94 | 8 370,39 | 9 383,29 |
| 19 | 5543,83 | 6688,94 | 8 370,39 | 9 383,29 |
| 20 | 5543,83 | 6688,94 | 8 370,39 | 9 383,29 |
| 21 | 5786,17 | 7023,21 | 8 370,39 | 9 383,29 |
| 22 | 5786,17 | 7023,21 | 8 370,39 | 9 383,29 |
| 23 | 5786,17 | 7023,21 | 8 370,39 | 9 383,29 |
| 24 | 6028,51 | 7357,47 | 8 370,39 | 9 383,29 |

**Germany**

***Fig.B2.1***: Tarifvertrag im Öffentlichen Dienst (TV-L). PhD Candidates and Postdoctoral Researchers initial salaries fall within the "*Entgeltgruppe*" 13.

**Anlage B zum TV-L**

**Entgelttabelle für die Entgeltgruppen 1 bis 15**

- Gültig vom 1. März 2015 bis 29. Februar 2016 -

| Entgelt-gruppe | Grundentgelt | | Entwicklungsstufen | | | |
|---|---|---|---|---|---|---|
| | Stufe 1 | Stufe 2 | Stufe 3 | Stufe 4 | Stufe 5 | Stufe 6 |
| 15 | 4.118,75 | 4.566,61 | 4.735,28 | 5.334,35 | 5.788,02 | |
| 14 | 3.729,09 | 4.136,20 | 4.374,67 | 4.735,28 | 5.287,81 | |
| 13 | 3.438,28 | 3.816,32 | 4.019,89 | 4.415,39 | 4.962,10 | |
| 12 | 3.083,48 | 3.420,82 | 3.897,74 | 4.316,51 | 4.857,41 | |
| 11 | 2.978,79 | 3.298,69 | 3.537,14 | 3.897,74 | 4.421,21 | |
| 10 | 2.868,29 | 3.182,35 | 3.420,82 | 3.659,28 | 4.112,96 | |
| 9 | 2.536,75 | 2.810,11 | 2.949,71 | 3.333,58 | 3.636,03 | |
| 8 | 2.373,90 | 2.629,82 | 2.746,13 | 2.856,65 | 2.978,79 | 3.054,40 |
| 7 | 2.222,68 | 2.461,14 | 2.618,18 | 2.734,50 | 2.827,58 | 2.908,98 |
| 6 | 2.181,97 | 2.414,61 | 2.530,94 | 2.647,27 | 2.722,87 | 2.804,29 |
| 5 | 2.088,90 | 2.309,92 | 2.426,25 | 2.536,75 | 2.624,00 | 2.682,16 |
| 4 | 1.984,21 | 2.199,43 | 2.344,82 | 2.426,25 | 2.507,68 | 2.560,01 |
| 3 | 1.955,13 | 2.164,52 | 2.222,68 | 2.315,74 | 2.391,35 | 2.455,32 |
| 2 | 1.803,91 | 1.995,84 | 2.054,02 | 2.112,17 | 2.245,94 | 2.385,54 |
| 1 | Je 4 Jahre | 1.606,17 | 1.635,23 | 1.670,13 | 1.705,04 | 1.792,28 |

***Fig.B2.2***: Base salaries of the federal remuneration system W (*Bundesbesoldungsordnung* W). Pay grades W1, W2 und W3 apply to *Juniorprofessor*, *Außerordentlicher Professor* and *Ordentlicher Professor*, respectively. Table provided by *Der Deutsche Hochschulverband* [GE20].

## Jahresbesoldung der Hochschullehrer beim Bund und in den Ländern aufgrund der W-Grundgehälter (ohne Berücksichtigung der Sonderzahlung, dem sog. Weihnachtsgeld) – Stand: März 2016

Alle Angaben ohne Gewähr

| | W 1 | W 2 | W 3 |
|---|---|---|---|
| Bund * | 52.375,80 | 65.069,28 | 72.724,56 |
| Baden-Württemberg | 55.200,05 ** | 69.509,28 | 78.906,12 |
| Bayern * | 52.287,12 | 64.902,84 | 76.823,88 |
| Berlin | 49.096,32 *** | 61.735,44 | 70.795,20 |
| Brandenburg **** | 49.010,64 | 64.030,44 | 75.663,36 |
| Bremen **** | 49.033,68 | 63.395,40 | 75.067,56 |
| Hamburg **** | 50.849,04 | 65.632,08 | 77.667,36 |
| Hessen * | 48.095,52 | 60.381,48 | 66.950,16 |
| Mecklenburg-Vorpommern | 48.910,92 | 63.399,00 | 73.901,64 |
| Niedersachsen | 49.653,84 | 64.433,28 | 70.094,52 |
| Nordrhein-Westfalen | 48.747,72 | 64.152,96 | 70.862,88 |
| Rheinland-Pfalz | 50.864,28 | 61.937,28 | 70.782,44 |
| Saarland | 48.812,88 ***** | 62.563,20 | 72.891,60 |
| Sachsen * | 50.834,28 | 62.316,48 | 70.205,16 |
| Sachsen-Anhalt | 49.691,40 | 65.381,64 | 72.579,84 |
| Schleswig-Holstein | 49.304,76 | 64.644,60 | 73.199,64 |
| Thüringen | 50.130,96 | 64.360,44 | 68.792,76 |

* Bei der Berechnung der Jahresbeträge in den Besoldungsgruppen W2 und W3 (in Sachsen auch in der Besoldungsgruppe W1) wurde jeweils die Erfahrungsstufe 1 zugrunde gelegt.

** Bei Beamten der Besoldungsgruppe W 1 ist gemäß § 23 Besoldungsgesetz BW für die Dauer von drei Jahren nach Entstehen des Anspruchs das Grundgehalt um 8 Prozent abzusenken. Diese Besoldungsabsenkung gilt nicht für Beamte, denen spätestens am 31. Dezember 2004 Dienstbezüge im Geltungsbereich des Besoldungsgesetzes BW zugestanden haben oder denen bis zur Entstehung des Anspruchs auf Dienstbezüge die Dienstbezüge aus einem anderen Amt im Geltungsbereich des Besoldungsgesetzes BW zugestanden haben.

*** Juniorprofessoren erhalten W 1-Grundgehalt in Höhe von 3.891,36 Euro zzgl. Zulage von 200 Euro in erster Beschäftigungsphase nach Bundesbesoldungsgesetz – Überleitungsfassung Berlin – Anlage II Bundesbesoldungsordnung W – Vorbemerkungen Nr. 1 Abs. 3

**** Grundgehälter plus Berücksichtigung der Gewährung eines Grundleistungsbezuges von monatlich 687,99 Euro in Brandenburg, monatlich 631,20 Euro in Bremen und monatlich 648,75 Euro in Hamburg.

***** Für nach dem 31.12.2010 neu berufene Juniorprofessorinnen/-professoren vermindert sich das Grundgehalt grundsätzlich um 370 Euro pro Monat für die Dauer von 2 Jahren; Ausnahmen hiervon sind allerdings möglich bei einem Mangel an geeigneten Bewerbern. Die Vergütungsabsenkung gilt ferner nicht für Beamte, denen aus einem vor dem 1.1.2011 übertragenen Eingangsamt der Besoldungsgruppe A 9 – A 13 ein Anspruch auf Dienstbezüge zustand (vgl. § 3 b Abs. 1 Haushaltsbegleitgesetz 2011).

**The Netherlands**

***Fig.B3***: CAO table of salaries defined by the Collective Agreement of Dutch Universities (CAO) set by the Association of Universities in the Netherlands (VSNU) [NE6]. Numbers valid from January 2016.

Tabel 4.5 Salaristabel per 01-01-2016

| | SALARISSCHALEN PER 01-01-2016 | | | | | | | | | | | FUNCTIESCHALEN | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TREDE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | H2 | H1 | P | SA | TOIO |
| 0 | 1.552 | 1.584 | 1.617 | 1.654 | 1.715 | 1.840 | 2.088 | 2.383 | 2.619 | 2.501 | 3.357 | 4.069 | 4.653 | 4.888 | 5.299 | 5.741 | 6.222 | 6.834 | 5.154 | 5.741 | 2.146 | | 1.766 |
| 1 | 1.617 | 1.654 | 1.654 | 1.686 | 1.791 | 1.893 | 2.146 | 2.501 | 2.744 | 2.619 | 3.483 | 4.185 | 4.774 | 5.006 | 5.447 | 5.896 | 6.421 | 7.051 | 5.299 | 5.896 | 2.501 | | |
| 2 | 1.686 | 1.715 | 1.715 | 1.753 | 1.893 | 2.025 | 2.264 | 2.619 | 2.884 | 2.744 | 3.597 | 4.304 | 4.888 | 5.154 | 5.592 | 6.057 | 6.625 | 7.273 | 5.447 | 6.057 | 2.619 | 1.893 | |
| 3 | 1.715 | 1.791 | 1.791 | 1.840 | 2.025 | 2.146 | 2.383 | 2.744 | 3.007 | 2.884 | 3.710 | 4.423 | 5.006 | 5.299 | 5.741 | 6.222 | 6.834 | 7.505 | 5.592 | 6.222 | 2.744 | 2.025 | |
| 4 | 1.753 | 1.840 | 1.893 | 1.959 | 2.088 | 2.206 | 2.441 | 2.819 | 3.129 | 3.007 | 3.821 | 4.535 | 5.154 | 5.447 | 5.896 | 6.421 | 7.051 | 7.746 | 5.741 | 6.421 | | 2.206 | |
| 5 | 1.791 | 1.893 | 1.959 | 2.025 | 2.146 | 2.264 | 2.501 | 2.884 | 3.245 | 3.129 | 3.947 | 4.653 | 5.299 | 5.592 | 6.057 | 6.625 | 7.273 | 7.990 | 5.896 | 6.625 | | | |
| 6 | 1.840 | 1.959 | 2.025 | 2.088 | 2.206 | 2.323 | 2.557 | 2.943 | 3.357 | 3.245 | 4.069 | 4.774 | 5.447 | 5.741 | 6.222 | 6.834 | 7.505 | 8.245 | 6.057 | 6.834 | | | |
| 7 | | 2.025 | 2.088 | 2.146 | 2.264 | 2.383 | 2.619 | 3.007 | 3.483 | 3.357 | 4.185 | 4.888 | 5.592 | 5.896 | 6.421 | 7.051 | 7.746 | 8.508 | 6.222 | 7.051 | | | |
| 8 | | | 2.146 | 2.206 | 2.323 | 2.441 | 2.681 | 3.072 | 3.597 | 3.483 | 4.304 | 5.006 | 5.664 | 6.057 | 6.625 | 7.273 | 7.990 | 8.780 | 6.421 | 7.273 | | | |
| 9 | | | 2.206 | 2.264 | 2.383 | 2.501 | 2.744 | 3.129 | | 3.597 | 4.423 | 5.154 | | 6.222 | 6.834 | 7.505 | 8.245 | 9.061 | 6.625 | 7.505 | | | |
| 10 | | | | 2.323 | 2.441 | 2.557 | 2.819 | 3.183 | | 3.710 | 4.535 | 5.223 | | | | | | | 6.834 | 7.746 | | | |
| 11 | | | | | | | | | | 3.821 | 4.597 | | | | | | | | 7.051 | 7.990 | | | |
| 12 | | | | | | | | | | 3.947 | | | | | | | | | 7.273 | 8.245 | | | |
| 13 | | | | | | | | | | | | | | | | | | | 7.505 | 8.508 | | | |
| 14 | | | | | | | | | | | | | | | | | | | | 8.780 | | | |
| 15 | | | | | | | | | | | | | | | | | | | | 9.061 | | | |

**Italy**

***Fig.B4.1***: Salaries table for Assistant Professors (*Ricercatore Universitari*). Numbers and system progression valid after the 2011 reform [IT4].



**Allegato 3 - art. 3, comma 6**

**Trattamento economico annuo lordo - Ricercatori a tempo determinato assunti secondo il nuovo regime**

**Tempo pieno**

| Stipendio tabellare (13 mensilità) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo |
|---|---|---|---|
| 20375,31 | 3.868,22 | 10.654,53 | 34.898,06 |

***Fig.B4.2***: Salary table for Assistant Professors (*Ricercatore Universitari*) showing a comparison of the old system for salary progression, based on biennial increase steps and the new system based on triennial increase steps [IT4].

**Allegato 1 - art. 2, comma 1**

**c) Rimodulazione trattamento economico annuo lordo - Ricercatori Universitari**
**Tempo Pieno**

| Progressione economica per classi e scatti biennali | | | | | Rimodulazione progressione economica per classi triennali | | | | | | Importi differenziali alla transizione | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Progressione economica per classi e scatti biennali | Stipendio tabellare (13 mensilità) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo (B) | Progressione economica per classi triennali | Stipendio tabellare (13 mensilità) **alla transizione** (C) | Stipendio tabellare (13 mensilità) **a regime** (D) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo regime triennale (E) | Variazione stipendio alla transizione (A-D) | Variazione lordo alla transizione (E-B) |
| 0 | 20.375,31 | 3.868,22 | 10.654,53 | 34.898,06 | 0 | 20.375,31 | 20.375,31 | 3.868,22 | 10.654,53 | 34.898,06 | 0,00 | 0,00 |
| 0 | 20.375,31 | 3.868,22 | 10.654,53 | 34.898,06 | 0 | 20.375,31 | 20.375,31 | 3.868,22 | 10.654,53 | 34.898,06 | 0,00 | 0,00 |
| 1 | 22.005,34 | 4.512,92 | 10.654,53 | 37.172,79 | 0 | 22.005,34 | 20.375,31 | 4.512,92 | 10.654,53 | 37.172,79 | 1.630,03 | 0,00 |
| 1 | 22.005,34 | 4.512,92 | 10.654,53 | 37.172,79 | 1 | 22.005,34 | 23.635,35 | 4.512,92 | 10.654,53 | 37.172,79 | -1.630,02 | 0,00 |
| 2 | 23.635,35 | 4.512,92 | 10.654,53 | 38.802,80 | 1 | 23.635,35 | 23.635,35 | 4.512,92 | 10.654,53 | 38.802,80 | 0,00 | 0,00 |
| 2 | 23.635,35 | 4.512,92 | 10.654,53 | 38.802,80 | 1 | 23.635,35 | 23.635,35 | 4.512,92 | 10.654,53 | 38.802,80 | 0,00 | 0,00 |
| 3 | 25.265,39 | 5.157,62 | 10.654,53 | 41.077,54 | 2 | 25.265,39 | 25.265,39 | 5.157,62 | 10.654,53 | 41.077,54 | 0,00 | 0,00 |
| 3 | 25.265,39 | 5.157,62 | 10.654,53 | 41.077,54 | 2 | 25.265,39 | 25.265,39 | 5.157,62 | 10.654,53 | 41.077,54 | 0,00 | 0,00 |
| 4 | 26.895,42 | 5.157,62 | 10.654,53 | 42.707,57 | 2 | 26.895,42 | 25.265,39 | 5.157,62 | 10.654,53 | 42.707,57 | 1.630,03 | 0,00 |
| 4 | 26.895,42 | 5.157,62 | 10.654,53 | 42.707,57 | 3 | 26.895,42 | 28.525,43 | 5.157,62 | 10.654,53 | 42.707,57 | -1.630,02 | 0,00 |
| 5 | 28.525,43 | 5.802,32 | 10.654,53 | 44.982,28 | 3 | 28.525,43 | 28.525,43 | 5.802,32 | 10.654,53 | 44.982,28 | 0,00 | 0,00 |
| 5 | 28.525,43 | 5.802,32 | 10.654,53 | 44.982,28 | 3 | 28.525,43 | 28.525,43 | 5.802,32 | 10.654,53 | 44.982,28 | 0,00 | 0,00 |
| 6 | 30.155,45 | 6.447,03 | 10.654,53 | 47.257,01 | 4 | 30.155,45 | 30.155,45 | 6.447,03 | 10.654,53 | 47.257,01 | 0,00 | 0,00 |
| 6 | 30.155,45 | 6.447,03 | 10.654,53 | 47.257,01 | 4 | 30.155,45 | 30.155,45 | 6.447,03 | 10.654,53 | 47.257,01 | 0,00 | 0,00 |
| 7 | 31.964,79 | 6.447,03 | 10.654,53 | 49.066,35 | 4 | 31.964,79 | 30.155,45 | 6.447,03 | 10.654,53 | 49.066,35 | 1.809,34 | 0,00 |
| 7 | 31.964,79 | 6.447,03 | 10.654,53 | 49.066,35 | 5 | 31.964,79 | 33.774,12 | 6.447,03 | 10.654,53 | 49.066,35 | -1.809,33 | 0,00 |
| 8 | 33.774,12 | 6.447,03 | 10.654,53 | 50.875,68 | 5 | 33.774,12 | 33.774,12 | 6.447,03 | 10.654,53 | 50.875,68 | 0,00 | 0,00 |
| 8 | 33.774,12 | 6.447,03 | 10.654,53 | 50.875,68 | 5 | 33.774,12 | 33.774,12 | 6.447,03 | 10.654,53 | 50.875,68 | 0,00 | 0,00 |
| 9 | 35.583,44 | 6.447,03 | 10.654,53 | 52.685,00 | 6 | 35.583,44 | 35.583,44 | 6.447,03 | 10.654,53 | 52.685,00 | 0,00 | 0,00 |
| 9 | 35.583,44 | 6.447,03 | 10.654,53 | 52.685,00 | 6 | 35.583,44 | 35.583,44 | 6.447,03 | 10.654,53 | 52.685,00 | 0,00 | 0,00 |
| 10 | 37.392,78 | 6.447,03 | 10.654,53 | 54.494,34 | 6 | 37.392,78 | 35.583,44 | 6.447,03 | 10.654,53 | 54.494,34 | 1.809,34 | 0,00 |
| 10 | 37.392,78 | 6.447,03 | 10.654,53 | 54.494,34 | 7 | 37.392,78 | 39.202,09 | 6.447,03 | 10.654,53 | 54.494,34 | -1.809,31 | 0,00 |
| 11 | 39.202,09 | 6.447,03 | 10.654,53 | 56.303,64 | 7 | 39.202,09 | 39.202,09 | 6.447,03 | 10.654,53 | 56.303,64 | 0,00 | 0,00 |
| 11 | 39.202,09 | 6.447,03 | 10.654,53 | 56.303,64 | 7 | 39.202,09 | 39.202,09 | 6.447,03 | 10.654,53 | 56.303,64 | 0,00 | 0,00 |
| 12 | 41.011,43 | 6.447,03 | 10.654,53 | 58.112,98 | 8 | 41.011,43 | 41.011,43 | 6.447,03 | 10.654,53 | 58.112,98 | 0,00 | 0,00 |
| 12 | 41.011,43 | 6.447,03 | 10.654,53 | 58.112,98 | 8 | 41.011,43 | 41.011,43 | 6.447,03 | 10.654,53 | 58.112,98 | 0,00 | 0,00 |
| 13 | 42.820,75 | 6.447,03 | 10.654,53 | 59.922,31 | 8 | 42.820,75 | 41.011,43 | 6.447,03 | 10.654,53 | 59.922,31 | 1.809,33 | 0,00 |
| 13 | 42.820,75 | 6.447,03 | 10.654,53 | 59.922,31 | 9 | 42.820,75 | 44.630,07 | 6.447,03 | 10.654,53 | 59.922,31 | -1.809,32 | 0,00 |
| 14 | 44.630,07 | 6.447,03 | 10.654,53 | 61.731,63 | 9 | 44.630,07 | 44.630,07 | 6.447,03 | 10.654,53 | 61.731,63 | 0,00 | 0,00 |
| 14 | 44.630,07 | 6.447,03 | 10.654,53 | 61.731,63 | 9 | 44.630,07 | 44.630,07 | 6.447,03 | 10.654,53 | 61.731,63 | 0,00 | 0,00 |
| 14 | 45.745,83 | 6.447,03 | 10.654,53 | 62.847,39 | 10 | 45.745,83 | 45.745,83 | 6.447,03 | 10.654,53 | 62.847,39 | 0,00 | 0,00 |
| 14 | 45.745,83 | 6.447,03 | 10.654,53 | 62.847,39 | 10 | 45.745,83 | 45.745,83 | 6.447,03 | 10.654,53 | 62.847,39 | 0,00 | 0,00 |
| 14 | 46.861,59 | 6.447,03 | 10.654,53 | 63.963,15 | 10 | 46.861,59 | 45.745,83 | 6.447,03 | 10.654,53 | 63.963,15 | 1.115,76 | 0,00 |
| 14 | 46.861,59 | 6.447,03 | 10.654,53 | 63.963,15 | 11 | 46.861,59 | 47.977,35 | 6.447,03 | 10.654,53 | 63.963,15 | -1.115,76 | 0,00 |
| 14 | 47.977,35 | 6.447,03 | 10.654,53 | 65.078,90 | 11 | 47.977,35 | 47.977,35 | 6.447,03 | 10.654,53 | 65.078,90 | 0,00 | 0,00 |
| 14 | 47.977,35 | 6.447,03 | 10.654,53 | 65.078,90 | 11 | 47.977,35 | 47.977,35 | 6.447,03 | 10.654,53 | 65.078,90 | 0,00 | 0,00 |
| 14 | 49.093,10 | 6.447,03 | 10.654,53 | 66.194,66 | 12 | 49.093,10 | 49.093,10 | 6.447,03 | 10.654,53 | 66.194,66 | 0,00 | 0,00 |
| 14 | 49.093,10 | 6.447,03 | 10.654,53 | 66.194,66 | 12 | 49.093,10 | 49.093,10 | 6.447,03 | 10.654,53 | 66.194,66 | 0,00 | 0,00 |
| 14 | 50.208,86 | 6.447,03 | 10.654,53 | 67.310,42 | 12 | 50.208,86 | 49.093,10 | 6.447,03 | 10.654,53 | 67.310,42 | 1.115,76 | 0,00 |
| 14 | 50.208,86 | 6.447,03 | 10.654,53 | 67.310,42 | 13 | 50.208,86 | 51.324,62 | 6.447,03 | 10.654,53 | 67.310,42 | -1.115,76 | 0,00 |
| 14 | 51.324,62 | 6.447,03 | 10.654,53 | 68.426,18 | 13 | 51.324,62 | 51.324,62 | 6.447,03 | 10.654,53 | 68.426,18 | 0,00 | 0,00 |
| 14 | 51.324,62 | 6.447,03 | 10.654,53 | 68.426,18 | 13 | 51.324,62 | 51.324,62 | 6.447,03 | 10.654,53 | 68.426,18 | 0,00 | 0,00 |

***Fig.B4.3***: Salary table for Associate Professors (*Professore Associati*). Numbers and system progression valid after the 2011 reform [IT4].



**Allegato 2 - art. 3, comma 2**

**b) Prospetto Trattamento Economico - Professori Associati (II fascia) assunti secondo il nuovo regime**

**Tempo Pieno**

| Progressione economica per classi triennali | Stipendio tabellare (13 mensilità) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo |
|---|---|---|---|---|
| 0 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 |
| 0 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 |
| 0 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 |
| 1 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 |
| 1 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 |
| 1 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 |
| 2 | 39.935,55 | 7.982,04 | 11.294,95 | 59.212,54 |
| 2 | 39.935,55 | 7.982,04 | 11.294,95 | 59.212,54 |
| 2 | 39.935,55 | 7.982,04 | 11.294,95 | 59.212,54 |
| 3 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 |
| 3 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 |
| 3 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 |
| 4 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 |
| 4 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 |
| 4 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 |
| 5 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 |
| 5 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 |
| 5 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 |
| 6 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 |
| 6 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 |
| 6 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 |
| 7 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 |
| 7 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 |
| 7 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 |
| 8 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 |
| 8 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 |
| 8 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 |
| 9 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 |
| 9 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 |
| 9 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 |
| 10 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 |
| 10 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 |
| 10 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 |
| 11 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 |
| 11 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 |
| 11 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 |
| 12 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 |
| 12 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 |
| 12 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 |

***Fig.B4.4***: Salary tables for Associate Professors (*Professore Associati*) showing a comparison between the old system for salary progression, based on biennial increase steps and the new system, based on triennial increase steps [IT4].

**Allegato 1 - art. 2, comma 1**

**b) Rimodulazione trattamento economico annuo lordo - Professori Associati (II fascia)**

**Tempo Pieno**

| Progressione economica per classi e scatti biennali | | | | | Rimodulazione progressione economica per classi triennali | | | | | | Importi differenziali alla transizione | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Progressione economica per classi e scatti biennali | Stipendio tabellare (13 mensilità) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo (B) | Progressione economica per classi triennali | Stipendio tabellare (13 mensilità) alla transizione (C) | Stipendio tabellare (13 mensilità) a regime (D) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo regime triennale | Variazione stipendio alla transizione (A-D) | Variazione lordo alla transizione (E-B) |
| 0 | 28.525,38 | 5.526,04 | 11.294,95 | 45.346,37 | 0 | 28.525,38 | 28.525,38 | 5.526,04 | 11.294,95 | 45.346,37 | 0,00 | 0,00 |
| 0 | 28.525,38 | 5.526,04 | 11.294,95 | 45.346,37 | 0 | 28.525,38 | 28.525,38 | 5.526,04 | 11.294,95 | 45.346,37 | 0,00 | 0,00 |
| 1 | 30.807,41 | 6.447,03 | 11.294,95 | 48.549,39 | 0 | 30.807,41 | 28.525,38 | 6.447,03 | 11.294,95 | 48.549,39 | 2.282,03 | 0,00 |
| 1 | 30.807,41 | 6.447,03 | 11.294,95 | 48.549,39 | 1 | 30.807,41 | 33.089,44 | 6.447,03 | 11.294,95 | 48.549,39 | -2.282,03 | 0,00 |
| 2 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 | 1 | 33.089,44 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 | 0,00 | 0,00 |
| 2 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 | 1 | 33.089,44 | 33.089,44 | 6.447,03 | 11.294,95 | 50.831,42 | 0,00 | 0,00 |
| 3 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 | 2 | 35.371,47 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 | 0,00 | 0,00 |
| 3 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 | 2 | 35.371,47 | 35.371,47 | 7.368,04 | 11.294,95 | 54.034,47 | 0,00 | 0,00 |
| 4 | 37.653,50 | 7.368,04 | 11.294,95 | 56.316,50 | 2 | 37.653,50 | 35.371,47 | 7.368,04 | 11.294,95 | 56.316,50 | 2.282,03 | 0,00 |
| 4 | 37.653,50 | 7.368,04 | 11.294,95 | 56.316,50 | 3 | 37.653,50 | 39.935,55 | 7.368,04 | 11.294,95 | 56.316,50 | -2.282,04 | 0,00 |
| 5 | 39.935,55 | 8.289,04 | 11.294,95 | 59.519,54 | 3 | 39.935,55 | 39.935,55 | 8.289,04 | 11.294,95 | 59.519,54 | 0,00 | 0,00 |
| 5 | 39.935,55 | 8.289,04 | 11.294,95 | 59.519,54 | 3 | 39.935,55 | 39.935,55 | 8.289,04 | 11.294,95 | 59.519,54 | 0,00 | 0,00 |
| 6 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 | 4 | 42.217,55 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 | 0,00 | 0,00 |
| 6 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 | 4 | 42.217,55 | 42.217,55 | 9.210,04 | 11.294,95 | 62.722,55 | 0,00 | 0,00 |
| 7 | 44.750,63 | 9.210,04 | 11.294,95 | 65.255,62 | 4 | 44.750,63 | 42.217,55 | 9.210,04 | 11.294,95 | 65.255,62 | 2.533,07 | 0,00 |
| 7 | 44.750,63 | 9.210,04 | 11.294,95 | 65.255,62 | 5 | 44.750,63 | 47.283,68 | 9.210,04 | 11.294,95 | 65.255,62 | -2.533,05 | 0,00 |
| 8 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 | 5 | 47.283,68 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 | 0,00 | 0,00 |
| 8 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 | 5 | 47.283,68 | 47.283,68 | 9.210,04 | 11.294,95 | 67.788,67 | 0,00 | 0,00 |
| 9 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 | 6 | 49.816,73 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 | 0,00 | 0,00 |
| 9 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 | 6 | 49.816,73 | 49.816,73 | 9.210,04 | 11.294,95 | 70.321,72 | 0,00 | 0,00 |
| 10 | 52.349,79 | 9.210,04 | 11.294,95 | 72.854,78 | 6 | 52.349,79 | 49.816,73 | 9.210,04 | 11.294,95 | 72.854,78 | 2.533,06 | 0,00 |
| 10 | 52.349,79 | 9.210,04 | 11.294,95 | 72.854,78 | 7 | 52.349,79 | 54.882,82 | 9.210,04 | 11.294,95 | 72.854,78 | -2.533,03 | 0,00 |
| 11 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 | 7 | 54.882,82 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 | 0,00 | 0,00 |
| 11 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 | 7 | 54.882,82 | 54.882,82 | 9.210,04 | 11.294,95 | 75.387,81 | 0,00 | 0,00 |
| 12 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 | 8 | 57.415,88 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 | 0,00 | 0,00 |
| 12 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 | 8 | 57.415,88 | 57.415,88 | 9.210,04 | 11.294,95 | 77.920,87 | 0,00 | 0,00 |
| 13 | 59.948,93 | 9.210,04 | 11.294,95 | 80.453,92 | 8 | 59.948,93 | 57.415,88 | 9.210,04 | 11.294,95 | 80.453,92 | 2.533,05 | 0,00 |
| 13 | 59.948,93 | 9.210,04 | 11.294,95 | 80.453,92 | 9 | 59.948,93 | 62.482,00 | 9.210,04 | 11.294,95 | 80.453,92 | -2.533,07 | 0,00 |
| 14 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 | 9 | 62.482,00 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 | 0,00 | 0,00 |
| 14 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 | 9 | 62.482,00 | 62.482,00 | 9.210,04 | 11.294,95 | 82.986,99 | 0,00 | 0,00 |
| 14 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 | 10 | 64.044,05 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 | 0,00 | 0,00 |
| 14 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 | 10 | 64.044,05 | 64.044,05 | 9.210,04 | 11.294,95 | 84.549,04 | 0,00 | 0,00 |
| 14 | 65.606,09 | 9.210,04 | 11.294,95 | 86.111,09 | 10 | 65.606,09 | 64.044,05 | 9.210,04 | 11.294,95 | 86.111,09 | 1.562,05 | 0,00 |
| 14 | 65.606,09 | 9.210,04 | 11.294,95 | 86.111,09 | 11 | 65.606,09 | 67.168,14 | 9.210,04 | 11.294,95 | 86.111,09 | -1.562,05 | 0,00 |
| 14 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 | 11 | 67.168,14 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 | 0,00 | 0,00 |
| 14 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 | 11 | 67.168,14 | 67.168,14 | 9.210,04 | 11.294,95 | 87.673,13 | 0,00 | 0,00 |
| 14 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 | 12 | 68.730,19 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 | 0,00 | 0,00 |
| 14 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 | 12 | 68.730,19 | 68.730,19 | 9.210,04 | 11.294,95 | 89.235,18 | 0,00 | 0,00 |
| 14 | 70.292,24 | 9.210,04 | 11.294,95 | 90.797,23 | 12 | 70.292,24 | 68.730,19 | 9.210,04 | 11.294,95 | 90.797,23 | 1.562,05 | 0,00 |
| 14 | 70.292,24 | 9.210,04 | 11.294,95 | 90.797,23 | 13 | 70.292,24 | 71.854,28 | 9.210,04 | 11.294,95 | 90.797,23 | -1.562,05 | 0,00 |
| 14 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 | 13 | 71.854,28 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 | 0,00 | 0,00 |
| 14 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 | 13 | 71.854,28 | 71.854,28 | 9.210,04 | 11.294,95 | 92.359,28 | 0,00 | 0,00 |

***Fig.B4.5***: Salary table for Full Professors (*Professore Ordinari*). Numbers and system progression valid after the 2011 reform [IT4]



**Allegato 2 - art. 3, comma 2**

## a) Trattamento Economico annuo lordo - Professori Ordinari (I fascia) assunti secondo il nuovo regime

**Tempo Pieno**

| Progressione economica per classi triennali | Stipendio tabellare (13 mensilità) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo |
|---|---|---|---|---|
| 0 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 |
| 0 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 |
| 0 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 |
| 1 | 56.235,67 | 11.402,92 | 12.096,12 | 79.734,71 |
| 1 | 56.235,67 | 11.402,92 | 12.096,12 | 79.734,71 |
| 1 | 56.235,67 | 11.402,92 | 12.096,12 | 79.734,71 |
| 2 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 |
| 2 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 |
| 2 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 |
| 3 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 |
| 3 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 |
| 3 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 |
| 4 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 |
| 4 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 |
| 4 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 |
| 5 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 |
| 5 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 |
| 5 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 |
| 6 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 |
| 6 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 |
| 6 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 |
| 7 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 |
| 7 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 |
| 7 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 |
| 8 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 |
| 8 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 |
| 8 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 |
| 9 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 |
| 9 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 |
| 9 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 |
| 10 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 |
| 10 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 |
| 10 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 |
| 11 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 |
| 11 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 |
| 11 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 |

***Fig.B4.6***: Salary tables for Full Professors (*Professore Ordinari)* showing a comparison between the old system for salary progression, based on biennial increase steps, and the new system, based on triennial increase steps [IT4].

**Allegato 1 - art. 2, comma 1**

**a) Rimodulazione trattamento economico annuo lordo - Professori Ordinari (I fascia)**

**Tempo Pieno**

| Progressione economica per classi e scatti biennali | | | | | Rimodulazione progressione economica per classi triennali | | | | | | Importi differenziali alla transizione | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Progressione economica per classi e scatti biennali | Stipendio tabellare (13 mensilità) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo (B) | Progressione economica per classi triennali | Stipendio tabellare (13 mensilità) **alla transizione** (C) | Stipendio tabellare (13 mensilità) **a regime** (D) | Assegno aggiuntivo (12 mensilità) | Indennità integrativa speciale (13 mensilità) | Totale annuo lordo regime triennale (E) | Variazione stipendio alla transizione (A-D) | Variazione lordo alla transizione (E-B) |
| 0 | 40.168,34 | 7.894,33 | 12.096,12 | 60.158,79 | 0 | 40.168,34 | 40.168,34 | 7.894,33 | 12.096,12 | 60.158,79 | 0,00 | 0,00 |
| 0 | 40.168,34 | 7.894,33 | 12.096,12 | 60.158,79 | 0 | 40.168,34 | 40.168,34 | 7.894,33 | 12.096,12 | 60.158,79 | 0,00 | 0,00 |
| 1 | 43.381,82 | 9.210,04 | 12.096,12 | 64.687,98 | 0 | 43.381,82 | 40.168,34 | 9.210,04 | 12.096,12 | 64.687,98 | 3.213,48 | 0,00 |
| 1 | 43.381,82 | 9.210,04 | 12.096,12 | 64.687,98 | 1 | 43.381,82 | 46.595,27 | 9.210,04 | 12.096,12 | 64.687,98 | -3.213,45 | 0,00 |
| 2 | 46.595,27 | 9.210,04 | 12.096,12 | 67.901,43 | 1 | 46.595,27 | 46.595,27 | 9.210,04 | 12.096,12 | 67.901,43 | 0,00 | 0,00 |
| 2 | 46.595,27 | 9.210,04 | 12.096,12 | 67.901,43 | 1 | 46.595,27 | 46.595,27 | 9.210,04 | 12.096,12 | 67.901,43 | 0,00 | 0,00 |
| 3 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 | 2 | 49.808,74 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 | 0,00 | 0,00 |
| 3 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 | 2 | 49.808,74 | 49.808,74 | 10.525,78 | 12.096,12 | 72.430,64 | 0,00 | 0,00 |
| 4 | 53.022,20 | 10.525,78 | 12.096,12 | 75.644,10 | 2 | 53.022,20 | 49.808,74 | 10.525,78 | 12.096,12 | 75.644,10 | 3.213,46 | 0,00 |
| 4 | 53.022,20 | 10.525,78 | 12.096,12 | 75.644,10 | 3 | 53.022,20 | 56.235,67 | 10.525,78 | 12.096,12 | 75.644,10 | -3.213,47 | 0,00 |
| 5 | 56.235,67 | 11.841,49 | 12.096,12 | 80.173,28 | 3 | 56.235,67 | 56.235,67 | 11.841,49 | 12.096,12 | 80.173,28 | 0,00 | 0,00 |
| 5 | 56.235,67 | 11.841,49 | 12.096,12 | 80.173,28 | 3 | 56.235,67 | 56.235,67 | 11.841,49 | 12.096,12 | 80.173,28 | 0,00 | 0,00 |
| 6 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 | 4 | 59.449,13 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 | 0,00 | 0,00 |
| 6 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 | 4 | 59.449,13 | 59.449,13 | 13.157,21 | 12.096,12 | 84.702,46 | 0,00 | 0,00 |
| 7 | 63.016,08 | 13.157,21 | 12.096,12 | 88.269,41 | 4 | 63.016,08 | 59.449,13 | 13.157,21 | 12.096,12 | 88.269,41 | 3.566,95 | 0,00 |
| 7 | 63.016,08 | 13.157,21 | 12.096,12 | 88.269,41 | 5 | 63.016,08 | 66.583,04 | 13.157,21 | 12.096,12 | 88.269,41 | -3.566,96 | 0,00 |
| 8 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 | 5 | 66.583,04 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 | 0,00 | 0,00 |
| 8 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 | 5 | 66.583,04 | 66.583,04 | 13.157,21 | 12.096,12 | 91.836,37 | 0,00 | 0,00 |
| 9 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 | 6 | 70.149,99 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 | 0,00 | 0,00 |
| 9 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 | 6 | 70.149,99 | 70.149,99 | 13.157,21 | 12.096,12 | 95.403,32 | 0,00 | 0,00 |
| 10 | 73.716,92 | 13.157,21 | 12.096,12 | 98.970,25 | 6 | 73.716,92 | 70.149,99 | 13.157,21 | 12.096,12 | 98.970,25 | 3.566,93 | 0,00 |
| 10 | 73.716,92 | 13.157,21 | 12.096,12 | 98.970,25 | 7 | 73.716,92 | 77.283,88 | 13.157,21 | 12.096,12 | 98.970,25 | -3.566,96 | 0,00 |
| 11 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 | 7 | 77.283,88 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 | 0,00 | 0,00 |
| 11 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 | 7 | 77.283,88 | 77.283,88 | 13.157,21 | 12.096,12 | 102.537,21 | 0,00 | 0,00 |
| 12 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 | 8 | 80.850,82 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 | 0,00 | 0,00 |
| 12 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 | 8 | 80.850,82 | 80.850,82 | 13.157,21 | 12.096,12 | 106.104,15 | 0,00 | 0,00 |
| 13 | 84.417,79 | 13.157,21 | 12.096,12 | 109.671,12 | 8 | 84.417,79 | 80.850,82 | 13.157,21 | 12.096,12 | 109.671,12 | 3.566,96 | 0,00 |
| 13 | 84.417,79 | 13.157,21 | 12.096,12 | 109.671,12 | 9 | 84.417,79 | 87.984,73 | 13.157,21 | 12.096,12 | 109.671,12 | -3.566,94 | 0,00 |
| 14 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 | 9 | 87.984,73 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 | 0,00 | 0,00 |
| 14 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 | 9 | 87.984,73 | 87.984,73 | 13.157,21 | 12.096,12 | 113.238,06 | 0,00 | 0,00 |
| 14 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 | 10 | 90.184,35 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 | 0,00 | 0,00 |
| 14 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 | 10 | 90.184,35 | 90.184,35 | 13.157,21 | 12.096,12 | 115.437,68 | 0,00 | 0,00 |
| 14 | 92.383,97 | 13.157,21 | 12.096,12 | 117.637,30 | 10 | 92.383,97 | 90.184,35 | 13.157,21 | 12.096,12 | 117.637,30 | 2.199,62 | 0,00 |
| 14 | 92.383,97 | 13.157,21 | 12.096,12 | 117.637,30 | 11 | 92.383,97 | 94.583,59 | 13.157,21 | 12.096,12 | 117.637,30 | -2.199,62 | 0,00 |
| 14 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 | 11 | 94.583,59 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 | 0,00 | 0,00 |
| 14 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 | 11 | 94.583,59 | 94.583,59 | 13.157,21 | 12.096,12 | 119.836,92 | 0,00 | 0,00 |
| 14 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 | 12 | 96.783,21 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 | 0,00 | 0,00 |
| 14 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 | 12 | 96.783,21 | 96.783,21 | 13.157,21 | 12.096,12 | 122.036,54 | 0,00 | 0,00 |
| 14 | 98.982,83 | 13.157,21 | 12.096,12 | 124.236,16 | 12 | 98.982,83 | 96.783,21 | 13.157,21 | 12.096,12 | 124.236,16 | 2.199,62 | 0,00 |
| 14 | 98.982,83 | 13.157,21 | 12.096,12 | 124.236,16 | 13 | 98.982,83 | 101.182,46 | 13.157,21 | 12.096,12 | 124.236,16 | -2.199,62 | 0,00 |
| 14 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 | 13 | 101.182,46 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 | 0,00 | 0,00 |
| 14 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 | 13 | 101.182,46 | 101.182,46 | 13.157,21 | 12.096,12 | 126.435,79 | 0,00 | 0,00 |

**UK**

***Fig.B5*** Salary scale and grade structure for academic positions at the University of Edinburgh

| National Spinal Point | Full-Time Salary from 1st August 2016 |
|---|---|
| 1 | £14,767 |
| 2 | £15,052 |
| 3 | £15,356 |
| 4 | £15,670 |
| 5 | £15,976 |
| 6 | £16,289 |
| 7 | £16,618 |
| 8 | £16,961 |
| 9 | £17,399 |
| 10 | £17,898 |
| 11 | £18,412 |
| 12 | £18,940 |
| 13 | £19,485 |
| 14 | £20,046 |
| 15 | £20,624 |
| 16 | £21,220 |
| 17 | £21,843 |
| 18 | £22,494 |
| 19 | £23,164 |
| 20 | £23,879 |
| 21 | £24,565 |
| 22 | £25,298 |
| 23 | £26,052 |
| 24 | £26,829 |
| 25 | £27,629 |
| 26 | £28,452 |
| 27 | £29,301 |
| 28 | £30,175 |
| 29 | £31,076 |
| 30 | £32,004 |
| 31 | £32,958 |
| 32 | £33,943 |
| 33 | £34,956 |
| 34 | £36,001 |
| 35 | £37,075 |
| 36 | £38,183 |
| 37 | £39,324 |
| 38 | £40,523 |
| 39 | £41,709 |
| 40 | £42,955 |
| 41 | £44,240 |
| 42 | £45,562 |
| 43 | £46,924 |
| 44 | £48,327 |
| 45 | £49,772 |
| 46 | £51,260 |
| 47 | £52,793 |
| 48 | £54,372 |
| 49 | £55,998 |
| 50 | £57,674 |
| 51 | £59,400 |
| 52 | £61,164 |
| 53 | £63,151 |
| 54 | £65,129 |
| 55 | £67,242 |
| 56 | £69,352 |
| 57 | £71,603 |
| 58 | £73,852 |
| 59 | £76,432 |
| 60 | £79,010 |
| 61 | £81,769 |
| 62 | £84,047 |
| 63 | £87,929 |
| 64 | £91,323 |
| 65 | £94,039 |
| 66 | £96,756 |

| University of Edinburgh Grade Structure | |
|---|---|
| Normal Grade Point Contribution Point | Normal Grade Point Contribution Point |
| UE01 | |
| UE01 | |
| | UE02 |
| | UE02 |
| UE03 | |
| UE03 | |
| | UE04 |
| | UE04 |
| UE05 | |
| UE05 | |
| | UE06 |
| | UE06 |
| UE07 | |
| UE07 | |
| | UE08 |
| | UE08 |
| UE09 | |
| UE09 | |
| | UE10 |
| | UE10 |

Spinal Point 1 & 2 temporarily increased to £15,056 to match the Living Wage (with effect from 1st Nov 2015)

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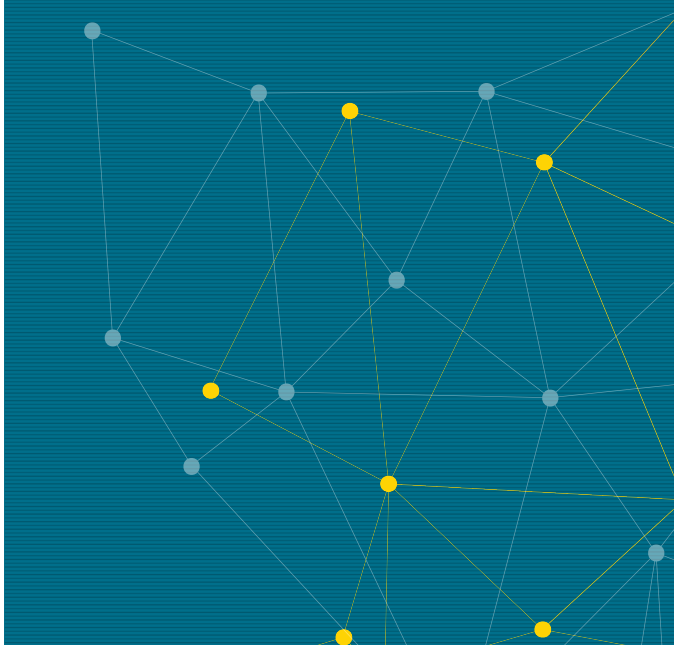

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