

# **Erasmus Mundus Master Programme in “Big Data Management and Analytics” (BDMA) Diploma Supplement**

This Diploma Supplement is consistent with the one developed by the European Commission, Council of Europe and UNESCO/CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international “transparency” and fair academic and professional recognition of qualifications (diplomas, degrees, certificates, etc.). It is designed to provide a description of the nature, level, context, content, and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value judgments, equivalence statements, or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

WARNING: This Diploma Supplement is only valid if presented with the official diploma.

## **1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION**

- 1.1. Family name(s) LASTNAME
- 1.2. Given name(s) FirstName
- 1.3. Date (day/month/year) and place (country) of birth  
Month xx 19xx in Place (Country)
- 1.4. Student identification number: xxxxxxxxxxxx

## **2. INFORMATION IDENTIFYING THE QUALIFICATION**

### **2.1. Name of Qualification and Title Conferred**

Master of Science in Computer Science and Engineering, Specialisation: Big Data Management and Analytics

### **2.2. Main Field(s) of Study for the Qualification**

Engineering Sciences

### **2.3. Name and Status of Awarding Institution(s) (in original language)**

Université Libre de Bruxelles (ULB)

Avenue F. D. Roosevelt, 50

B-1050 Bruxelles (Belgique)

Tél. 32 2 650 21 11 - Fax 32 2 650 35 95 - Internet : <http://www.ulb.ac.be>

Higher Education Institution officially recognised and subsidised by the French Community of Belgium and controlled by the Government through a commissioner or a delegate (Decree of July 12, 1990 on the control of academic institutions).

### **2.4. Name and Status of Institution(s) (if different(s) from 2.3.) Administering Studies**

The learning activities in the programme are jointly organised with the following institutions:

- Universitat Politècnica de Catalunya (UPC), Spain
- Technische Universität Berlin (TUB), Germany
- Technische Universiteit Eindhoven (TU/e), Netherlands
- Université François Rabelais Tours (UFRT), France

(See Section 6.1 for a detailed description of study internships made in the context of this programme)

### **2.5. Language(s) of Instruction/Examination**

The teaching and evaluation language of the different learning activities is English. It is nevertheless possible that one or more courses are provided in another language. In that case, the title of this (these) course(s) will be mentioned in the language concerned in the annex “Personal transcript relative to the path followed by the student”.

### 3. INFORMATION ON THE LEVEL OF THE QUALIFICATION

#### 3.1. Level of Qualification

The studies belong to the second cycle of university level education.

(See Section 8 for more detailed explanation regarding the division of the studies in cycles).

#### 3.2. Official Length of Programme

120 ECTS obtained in at least 2 years of study.

#### 3.3. Access Requirement(s)

To enter the BDMA master, students must meet the following eligibility criteria:

- They have been awarded a Bachelor's degree (i.e., the equivalent of 180 ECTS) with a major in computer science, from an accredited university. The university has to be listed in the World Higher Education Database (WHED), be accredited by other Institutions of Higher Education, or be included in the following university rankings:
  - The Times Higher Education World University Rankings
  - Quacquarelli Symonds (QS) World University Rankings
  - Academic Ranking of World Universities
- The curriculum and grades of the candidate are approved by a selection committee consisting of academic staff members of all organising institutions.
- The candidate must be able to demonstrate proficiency in English by equivalent to level B2 in the Common European Framework of Reference for Languages (CEFR). The consortium will rely on how certification bodies evaluate their own equivalences against this framework, e.g., Cambridge General English FCE, IELTS (Academic) 5.5, TOEFL (paper based) 570, TOEFL (computer based) 230, TOEFL (internet based) 72.

### 4. CONTENTS AND RESULTS OBTAINED

#### 4.1. Mode of Study

Full-time studies. A year of study corresponds to 60 ECTS credits that may be taken in one academic year. The ECTS is a relative measure of the overall work of a student for one or more learning activities in an education programme. A credit corresponds to 25-30 hours of learning activities on average. The hourly load is only partially devoted to courses organised by the institution, and includes other related activities, such as course work, personal exercises, preparations, studies, projects, literature research, examinations, etc.

A year of study corresponds to an approximate workload of 1800 hours, which constitutes a full-time day education programme.

The structure of the education system is detailed in Section 8.

#### 4.2. Programme Requirements

The European Master programme in Big Data Management and Analytics (BDMA) is designed to provide understanding, knowledge, and skills in those particular areas of computer science that are vital for decision makers. Its main objective is to train computer scientists who understand the strategies of modern enterprise managers. It prepares the graduates not only to answer today's professional challenges by a strong connection with the needs coming from the industry, but also to pursue their studies into doctorate programmes, through strong connections with the researchers' and innovators' views.

The BDMA programme is an Erasmus Mundus Joint Master Degree (EMJMD). Such degrees aim to:

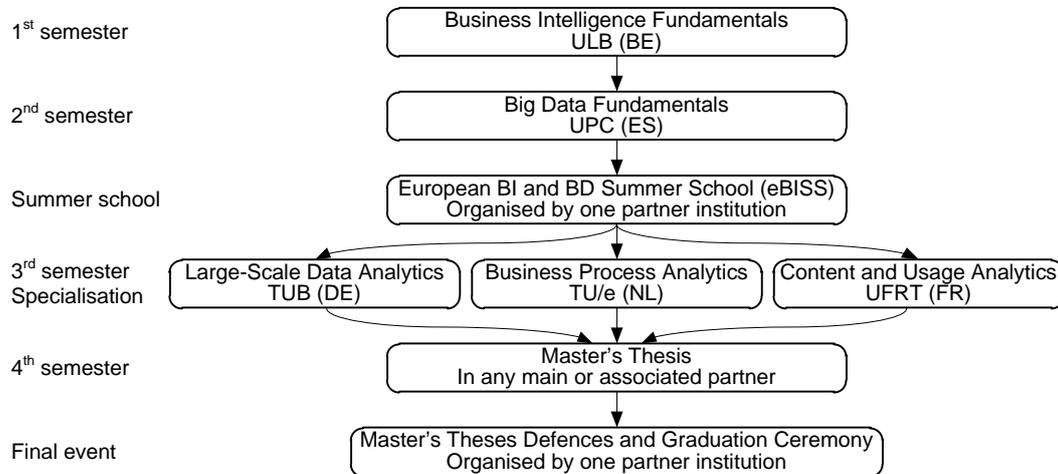
- Foster excellence, innovation, and internationalisation in Higher Education Institutions
- Boost the attractiveness of the European Higher Education Area (EHEA) and support the EU's external action in the field of higher education
- Improve the level of competences and skills of Master graduates, and their employability.

EMJMDs are highly integrated study programmes that are delivered by an international consortium of Higher Education Institutions. Where relevant, the consortium can also include other educational and non-educational partners with specific expertise in the field covered by the joint programme.

#### 4.3. Programme Details

BDMA is a two-year (4 semesters, 120 ECTS) programme prepared by five higher education institutes in five European countries. Enrolled students join Université Libre de Bruxelles (ULB) during their first semester and Universitat Politècnica de Catalunya (UPC) during their second semester to follow a fundamental programme. After the first year, students attend a Summer School organised by the consortium. During their third semester, students choose a specialisation among the ones offered by Technische Universität Berlin (TUB), Technische Universiteit Eindhoven (TU/e), or Université François Rabelais Tours (UFRT). For their fourth semester, students either do an internship in industry, for instance with one of the associated industrial partners, or write a master's thesis in the research

lab of one of the academic associated or main partners. They complete their studies by attending a Final Event organised by the Consortium in which they defend their master's thesis. The following schema visualises the study components and potential mobility paths.



Structure of the BDMA programme and potential mobility paths.

#### 4.4. Grading Scheme and Grade Distribution Guidance

BDMA is a joint master degree and grades for the courses have been given according to the local regulations of the institute where the course was taught. These grades were subsequently transformed into the Belgian grading system in which the final grade of a course is expressed in the form of a grade between 0 and 20, with minimal threshold to succeed being 10/20. For this transformation the following equivalence table was used:

ECTS	Definition	US	BE, FR	ES	NL	DE
A	<b>Excellent:</b> outstanding performance with only minor errors	A	[18-20]	[9-10]	[9.2-10]	[1.0-1.3]
B	<b>Very Good:</b> above the average standard but with some errors	B+	[16-18[	[8-9[	[8.4-9.2[	[1.7-2.0]
C	<b>Good:</b> generally sound work with a number of notable errors	B	[14-16[	[7-8[	[7.6-8.4[	[2.3-2.7]
D	<b>Satisfactory:</b> fair but with significant shortcomings	C+	[12-14[	[6-7[	[6.8-7.6[	[3.0-3.3]
E	<b>Sufficient:</b> performance meets the minimum criteria	C	[10-12[	[5-6[	[6-6.8[	[3.7-4.0]
F	<b>Fail:</b> considerable further work is required	F	[0-10[	[0-5[	[0-6[	5.0

The evaluation of a whole year or whole cycle is expressed in the same way. In principle, a student succeeds if he/she succeeded every individual course, although the examination committee has the power to decide sovereignly over the sufficiency to obtain the degree in function of all grades obtained by the student. Concretely, this implies that in case of one or more failed courses the examination committee may decide nevertheless to award the degree to the student based on the results of the whole year or cycle. Such decision is taken by the examination committee in its deliberation meeting and is clearly indicated in the transcript. Next to the numerical grading scale, also the ECTS grade is indicated in the annex "Personal transcript relative to the path followed by the student".

#### 4.5. Overall Classification of the Graduate

On top of the ECTS grading system as explained in Section 4.4, for each year of study, as well as for the complete cycle of the Master studies, the jury determines an honour. The possible honours, in French, are: "avec satisfaction" (satisfactory), "avec distinction" (with distinction), "avec grande distinction" (with great distinction) or "avec la plus grande distinction" (with the greatest distinction).

Students who pass with:

- a weighted mean equal or more than 13,6/20 obtain the honour "distinction";
- a weighted mean equal or more than 15,4/20 obtain the honour "grande distinction";
- a weighted mean equal or more than 17,6/20 obtain the honour "la plus grande distinction";
- all other passing students obtain the honour "satisfactory".

In exceptional circumstances the examination jury may decide, based on a vote, to award a higher honour than that one that corresponds to the weighted average grade.

The obtained grades are mentioned in the annex "Personal transcript relative to the path followed by the student".

## 5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION

### 5.1. Access to Further Study

The holders of an academic master's degree of 120 ECTS and of 60 ECTS have access to university studies leading to a Qualification degree for secondary education that permits the holder to teach in a secondary education institute. The holders of a master's degree of 120 ECTS have access to advanced master studies and to third cycle studies, including doctoral studies. The advanced master studies are a professionalising cycle.

### 5.2. Professional Status (if applicable)

Job title in original language: Ingénieur civil (Civil engineer)

## 6. ADDITIONAL INFORMATION

### 6.1. Additional Information

All information related to the conditions for academic success and the awarding of results are included in the Regulations for examinations and juries of the Faculty / School / Institute available from the following address:

<https://www.ulb.ac.be/ulb/greffe/documents/reglements-examens-jurys.html>

#### - Partner institutions in the context of a multiple diploma agreement

This academic degree was conferred in the context of the multiple diploma agreement between the Université Libre de Bruxelles (ULB) and

Universitat Politècnica de Catalunya (UPC)  
Carrer Jordi Girona 1-3  
08034 Barcelona  
Spain

Technische Universität Berlin (TUB)  
Straße des 17. Juni 135  
D-10623 Berlin  
Germany

Technische Universiteit Eindhoven (TU/E)  
De Rondon 70  
5612 AZ Eindhoven  
Netherlands

Université François Rabelais Tours (UFRT)  
60 rue du Plat D'Etain  
37020 Tours Cedex 1  
France

#### - Exchange Programmes

This exchange programme was carried out:

At Université Libre de Bruxelles (ULB), Belgium, during the first semester of the academic year 20xx-20yy  
At Universitat Politècnica de Catalunya (UPC), Spain, during the second semester of the academic year 20xx-20yy  
At xxxx (XXXX), Country, during the academic year 20xx-20yy

#### - Master's Thesis

"MEMO-G-CCC Thesis title" performed under the direction of professors vvv BBB, yyy VVV, ggg HHH.

#### - Project

Not applicable

- Internships

Not applicable

- Change of university during the studies

Not applicable

- Specific admission requirements

Not applicable

- Complementary programme

Not applicable

- Spreading

Not applicable

For a detailed grade transcript, see the annex "Personal transcript relative to the path followed by the student".

## 6.2. Further Information Sources

Website of ULB: <http://www.ulb.ac.be>

Website of the Ministry of the French Community of Belgium: <http://www.enseignement.be/citoyens/annuaire/sup/index.asp>

Website of the NARIC centre: <http://www.enseignement.be/index.php?page=24808&navi=2087>

Website of the ENIC centre: <http://www.enic-naric.net>

Website of the BDMA Master Programme: <http://bdma.univ-tours.fr/>

Website of the Erasmus+ programme of the European Commission: [http://ec.europa.eu/programmes/erasmus-plus/index\\_en.htm](http://ec.europa.eu/programmes/erasmus-plus/index_en.htm)

## 7. CERTIFICATION ON THE SUPPLEMENT

Brussels, Day Month 20xx

ULB Seal

Secretary of the Jury,

FirstName LASTNAME

## 8. INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEMS

### 8.1 Description of the Higher Education System of the French Community of Belgium

#### 8.1.1 General Framework

The French Community of Belgium aims to foster excellence, innovation, and internationalisation in Higher Education and has three types of higher education institutions:

- **Universities** offer cutting-edge education in the chosen field of study as well as a solid general training and introduction to scientific research. There are six universities in the French Community of Belgium. The universities cover all fields of study.
- **University colleges** (*Hautes Ecoles*) are non-university higher education institutions whose courses prepare for specific professional practices. They offer undergraduate courses (short-term courses) or undergraduate and graduate courses (long-term courses), in eight areas of studies: Agronomics; Applied arts; Economics; Paramedics; Education; Social Sciences; Technology; Translation and Interpretation.
- **Art colleges** (*Ecoles supérieures des Arts*) are higher education institutions that organise courses combining theory and practical activities in the following four artistic fields: fine, visual, and spatial arts, music, dramatic art and art of oratory, performing arts, and broadcasting and communication techniques.

#### 8.1.2 Degrees

The degrees delivered by the higher education institutions of the French Community of Belgium are Bachelor's, Master's and Doctoral degrees. The organisation of the studies depends on the type of higher education institution.

##### Universities

The programmes offered by universities are organised into three levels of study.

- Undergraduate courses last for 3 years (180 ECTS) and lead to the conferral of a Bachelor's Degree.
- Graduate studies lead to the conferral of a:
  - Master's degree after 1 year (60 ECTS) or 2 years (120 ECTS);
  - Veterinary degree after 3 years (180 ECTS);
  - Medical degree after 4 years (240 ECTS).Graduate studies can also lead to the conferral of an Advanced Master's degree (60 ECTS at least). This degree makes it possible to acquire a specialised professional qualification and is only open to students who already hold a Master's degree.
- Postgraduate studies lead to the conferral of the academic title of doctor after defending a doctoral thesis.

##### University Colleges

The programmes offered by university colleges are organised as follows.

The undergraduate courses (short-term courses) lead to the conferral of the Bachelor's degree. They correspond to 180 to 240 ECTS which can be acquired in three or four years of study, respectively. These courses are both practical and theoretical and often lead directly to the exercise of a specific profession. Some university colleges also offer a year of specialisation at the end of this undergraduate course.

The combined undergraduate and graduate courses (long-term courses) offer cutting-edge scientific and technological programmes that lead to the conferral of a:

- Bachelor's degree, at the end of the undergraduate course. This course of training corresponds to 180 ECTS vouching for the completion of at least three years of study. This undergraduate course offers a general scientific training and a specific training ensuring the "transition" towards the graduate course.
- Master's degree, at the end of the graduate course. This course of training corresponds to 60 or 120 ECTS that can be acquired in respectively at least one or two years of study. The Master's studies consist of a specialisation in the chosen discipline.

##### Art Colleges

Art colleges organise their studies as an undergraduate course (short-term course) or as a combined undergraduate and graduate course (long-term course).

The undergraduate courses (short-term courses), so-called "vocational" cycles, lead to the conferral of the Bachelor's degree. They correspond to 180 ECTS that can be acquired in three years of studies. These studies generally lead to the exercise of a specific profession upon completion of the course.

The combined undergraduate and graduate courses (long courses) include:

- an initial transition programme of study leading to the conferral of a Bachelor's degree. Its duration is of three years (180 ECTS).

- a second programme of study leading to the conferral of a Master's degree. This course, that ensures specialisation in a specific discipline, corresponds to 60 or 120 ECTS that can be acquired in one or two years of study.

### 8.1.3 Access Requirements

#### Bachelor Programmes

The general access requirement for a Bachelor programme is the secondary school certificate. The institution boards may admit persons who do not meet the general access requirements taking the legal stipulations into account. For some specific Bachelor programmes, students must additionally pass a specific entry examination to get access.

#### Master Programmes

The general access requirement for a Master programme is a Bachelor's degree. In some cases students have to follow an extra preparatory programme. Bachelor degrees from non-university institutions may give access to some Master programmes in university institutions conditioned to the successful completion of a bridging programme.

#### Doctorate Programmes

The general access requirement is a Master's degree. The university board may impose an aptitude test. Exceptionally a university board may admit persons who do not meet the general access requirements taking the legal stipulations into account.

### 8.1.4 The Credit System of the French Community of Belgium

The credit system of the French Community of Belgium is fully based on the European Credit Transfer and Accumulation System (ECTS). A standard programme of one academic year equals approximately 60 ECTS. Each programme component counts for at least three ECTS. One credit represents 30 hours of a student's workload.

### 8.1.5 Flexible Learning Paths

Students can opt for the standard learning path or for an individual combination of programme components. The student receives a degree after obtaining all the programme's required credits or when he/she is found to have sufficiently reached the requirements of the programme.

### 8.1.6 Quality Assurance and Accreditation

The Agency for the quality evaluation of higher education (AEQES) is the independent body responsible for the planning and following-up of external quality evaluation procedures. AEQES belongs to the European Association for Quality Assurance in Higher Education (ENQA).

The Directory of Higher Education institutions in the French Community contains detailed information about the higher education institutions recognised and/or subsidised by the Ministry of the French Community in Belgium as well as the programmes they offer.

### 8.1.7 Diagram of the Education System of the French Community of Belgium

Education system in the French Community of Belgium before the application of the Decree of March 31, 2004 defining higher education, promoting its integration into the European higher education area, and refinancing universities, in accordance with the Decree of September 5, 1994 concerning the system of University studies and academic degrees, with the Decree of August 5, 1995 concerning the General organisation of higher education in University Colleges, with the Decree of May 17, 1999 concerning artistic higher education, and with the law of February 18, 1977 on the organisation of the teaching of architecture.

Preschool education							
Primary education (6 years)							
Secondary education : general, technical, artistic, professional (6 years)							
Higher education							
		Universities	University Colleges		Art Colleges		
			Short cycle	Long cycle	Short cycle	Long cycle	
1 <sup>st</sup> cycle	Basic	2 years (exc. Medicine, veterinary medicine, theology – 3 years)	3 / 4 years	2 years	3 years	2 years	3 years
	Complementary	1 year	/	/	/	/	/
Specialisations		/	1 year	/	/	/	
2 <sup>nd</sup> cycle	Basic	2 ( <i>licencié</i> ), 3 ( <i>licencié</i> , master, engineer, pharmacist, doctor in veterinary medicine) or 4 years (doctor in medicine)	/	2 to 3 years	/	2 to 3 years	
	Qualification for higher education	1 year	/	1 year	/	1 year	
	Advanced	1 year	/	/	/	/	
Specialisations		/	/	1 to 2 years	/	/	
3 <sup>rd</sup> cycle	DES and DEA	1 to 2 years (max. 6 years for the DES in specialised medicine)	/	/	/	/	
	Doctorate	3 years (in practice: 4 years)					

Education system in the French Community gradually implemented from the academic year 2004-2005 according to the Decree of March 31, 2004 defining higher education, promoting its integration into the European higher education area, and refinancing universities, to the Decree of March 31, 2004 amending the Decrees of February 27, 2003 establishing the academic degrees delivered by the University Colleges organised or subsidised by the French Community and fixing the minimum timetables and of September 9, 1996 concerning the financing of the University Colleges organised or subsidised by the French Community, the Decree of March 31, 2004 adapting the organisation of the teaching of architecture for integration into the European area of higher education, and the Decree of March 31, 2004 adapting the regulation of the artistic higher education for its integration into the European space.

Preschool education						
Primary education (6 years)						
Secondary education: general, technical, artistic, professional (6 years)						
Higher education						
		Universities	University Colleges		Art Colleges	
			Short cycle	Long cycle	Short cycle	Long cycle
1 <sup>st</sup> cycle	Bachelor	180 ECTS (3 years)	180 ECTS (3 years) 240 ECTS (4 years) : midwife	180 ECTS (3 years)	180 ECTS (3 years)	180 ECTS (3 years)
Specialisation		/	60 ECTS (1 year)	/	/	/
2 <sup>nd</sup> cycle	Master	60 ECTS (1 year) : master 120 ECTS (2 years) : master with didactic, specialised, or in- depth focus 180 ECTS (3 years) : master in veterinary medicine 240 ECTS (4 years) : master in medicine	/	60 ECTS /year (1 to 2 years)	/	60 ECTS /year (1 to 2 years)
	Qualification for higher education	30 ECTS	/	30 ECTS	/	1 year
	Advanced/Specialised Master	Advanced Master	Specialised master			
		60 ECTS at least (1 year at least)	/	/	/	60 ECTS (1 year)
3 <sup>rd</sup> cycle	Doctorate	180 ECTS	/	/	/	/

### 8.1.9 National Sources of Information

- Website of the ULB: <http://www.ulb.ac.be>
- Website for education in the French Community of Belgium: <http://www.enseignement.be>
- Website of the NARIC centre: <http://www.enseignement.be/index.php?page=24808&navi=2087>

## 8.2 Description of the French Higher Education System

### 8.2.1 General Framework

The French higher education system is made up of several different types of establishment, which may be in either the public or the private sector:

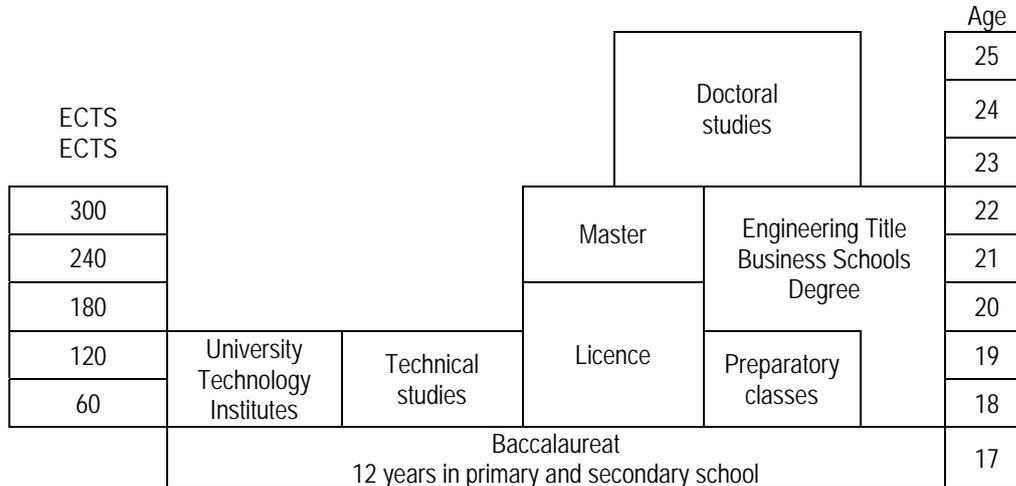
- **Universities:** there are 83 public sector universities in France. They are funded by the State, which applies a very strict procedure for approval of the national diplomas they award. This makes it possible to offer an excellent standard of education at a remarkably modest annual cost. The universities teach all disciplines.
- **Grandes Ecoles and specialist schools:** the “grandes écoles” or post-graduate schools offer five-year courses, which include two years of initial preparation either within the post-graduate school itself or in preparatory classes offered by high schools. These preparatory classes (Classes Préparatoires aux Grandes Ecoles, CPGE), commonly referred to as “prépa” and famed for their exacting standards, prepare students over a two-year period to take the entrance examinations for one or more “grandes écoles”.
- **Technical establishments:** the shorter courses offered, generally of two or three years, focus on business, industry or services. The courses are generally provided by multi-disciplinary institutes dependent on universities or specialist schools. They invariably include internships with companies, and equip students with very real employment prospects. The selection procedure for admission is generally very strict.

In the framework of the European Bologna process and the harmonisation within the European Space of Higher Education, the French Higher Education System in Universities is structured following 3 National Degrees: the Licence, the Master and the Doctorate. This structure, called LMD, aims to clarify the system in order to promote student mobility, cross-disciplinary mobility and professional-academic mobility.

In addition, National Degrees and Titles may be awarded following several other ways such as, but not limited to, 2-year technical institutes, 5-year engineering schools or business schools.

Equivalence and parallel admission between different Higher Education Institutions are explicit and functional.

The main scheme of French Higher Education system is depicted next:



Specific training in Medicine, Architecture, Arts, etc. are also proposed within the framework of Higher Education system in France and are subject to specific description when needed.

An overall description can be found on the website of the French Ministry Higher Education and Research <http://www.enseignementsup-recherche.gouv.fr/pid25125/le-systeme-francais-d-enseignement-superieur.html>

### 8.2.2 Grading Systems and Credits

#### Institutional Grading Systems

The skills and knowledge acquisition are measured either by continuously monitoring, or a final examination or by both methods combined control. Each exam is graded out of 20.

A Teaching Unit (UE) is validated when the average score obtained in the different elements of this course is equal to or greater than the average (10/20). Any validated UE gives the student the number of corresponding ECTS. These credits are definitively acquired and capitalised.

## European Credit Transfer System

Within the European Union, the international validation of degrees rests on a common system of academic credits called ECTS credits (European Credit Transfer System). ECTS credits are cumulative and transferable.

Each semester worth 30 ECTS shared by most of the European countries: Licence with 6 semester/180 ECTS; Master with 4 semesters/120 ECTS (i.e., 300 ECTS in total).

Each course and activity worth ECTS proportionally to the workload of students including homework. In the framework of their learning agreement, students can be awarded ECTS from foreign institutions and can have recognition of their ECTS in foreign institutions.

### 8.2.3 Academic Calendar

In France, the academic year begins in September or October and ends in May or June, depending on the institution and programme. The year is punctuated by vacations, including two weeks at the end of the year (Christmas and New Year's). The two semesters are divided by a short break following final examinations at the end of the first semester in January. The summer vacation lasts more than two months and always includes the months of July and August.

### 8.2.4 Courses

There are two basic types of courses in French higher education, particularly in the universities.

#### Large Lecture Courses

Lectures are given in lecture halls accommodating from 100 to 1,000 learners. The professor speaks, while his or her students listen and take notes. Professors often prepare summaries of their lectures to help students prepare for exams.

#### Sections and Labs

In sections and labs, small groups of students meet to apply or explore in greater detail the material covered in lectures. Attendance at sections and labs is mandatory, whereas attendance at the lectures is not.

In career-oriented programmes offered in the universities (DUT programmes, *licences professionnels*, and professional masters), internships and practical training are required in addition to the small-group sections and labs.

### 8.2.5 Degrees and Diplomas

#### Licence

In France the National Licence has to be done in 6 semesters equivalent to 180 ECTS. In order to clarify the offer, and starting from 2014, the different Licences are proposed with 45 labels distributed in 4 domains:

- Literature, Arts and Languages
- Law, Economy and Management
- Human and Social Sciences
- Science, Technology and Health

The successful Licence programme allows the students to apply for a Master programme in France or in any other country.

#### Master

Master programmes are organised in 4 semesters equivalent to 120 ECTS. It contains academic courses, applied methodologies and, most of the time, practical training(s). It is proposed either for preparing the students to enter a doctoral programme - and then initiation to research is included in the Master programme - or to qualify the students for a high level professional activity.

The study of a foreign language is mandatory.

A Master's degree is delivered at least 5 years after the Baccalauréat (BAC+5) with a workload of 300 ECTS, Licence included.

The successful Master programme allows the students to apply for a Doctoral programme in France or in any other country.

#### Doctorate

Doctoral studies are open to Master holders - or equivalent such as Engineers or some Business degrees. Doctoral programme is a research programme in 3 years (BAC+8).

Doctoral candidates are accepted in Doctoral programmes by the president of the Higher Education Institution, from which depends the Doctoral School, upon recommendation of the Head of the Doctoral School and the future Doctoral Supervisor.

After a successful research activity of 3 years and a Doctoral thesis defence, the candidates are awarded the Doctoral degree by the Doctoral School where they are registered.

A Doctoral School belongs to a habilitated Higher Education Institution. It gathers research teams and departments in charge of the training of the candidates. It offers to the candidates a high scientific level environment and a professional training. It is open to international collaboration and mobility and participates to the attractiveness of the European Research Area.

Doctoral Schools are regularly audited by the French Ministry of Higher Education and Research.

The “national diplomas” (*diplômes nationaux*) awarded in most French institutions of higher education are regulated by the government.

- The national diplomas conferred by France’s universities and other public educational institutions (such as national schools of art or architecture) demand adherence to national standards of quality that must be met by any institution that wishes to award the degree. National diplomas therefore have the same value regardless of the institution that awards them.
- The *diplôme d’ingénieur* is a national diploma. The schools that award it are accredited by the CTI, the French national commission on engineering degrees.
- An analogous system of accreditation exists for government-recognised schools of business and management. The degrees awarded by such schools are recognised by the French Ministry of National Education. Some schools of management have also obtained one or another form of international recognition (such as Equis, AMBA, or AACSB).
- Schools of art and specialised schools are also subject to national certification.

#### 8.2.6 National Sources of Information

- Ministère de l’Education Nationale, de l’Enseignement Supérieur et de la Recherche  
<http://www.enseignementsup-recherche.gouv.fr>
- Agence française pour la promotion de l’enseignement supérieur, l’accueil et la mobilité internationale  
<http://www.campusfrance.org/>
- Agence nationale Erasmus+  
<http://www.agence-erasmus.fr/>

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## 8.3 Description of the German Higher Education System

### 8.3.1 Types of Institutions and Institutional Status

Higher education (HE) studies in Germany are offered at three types of Higher Education Institutions (HEI).<sup>1</sup>

- *Universitäten* (Universities) including various specialised institutions, offer the whole range of academic disciplines. In the German tradition, universities focus in particular on basic research so that advanced stages of study have mainly theoretical orientation and research-oriented components.
- *Fachhochschulen* (Universities of Applied Sciences) concentrate their study programmes in engineering and other technical disciplines, business-related studies, social work, and design areas. The common mission of applied research and development implies a distinct application-oriented focus and professional character of studies, which include integrated and supervised work assignments in industry, enterprises or other relevant institutions.
- *Kunst- und Musikhochschulen* (Universities of Art/Music) offer studies for artistic careers in fine arts, performing arts and music; in such fields as directing, production, writing in theatre, film, and other media; and in a variety of design areas, architecture, media and communication.

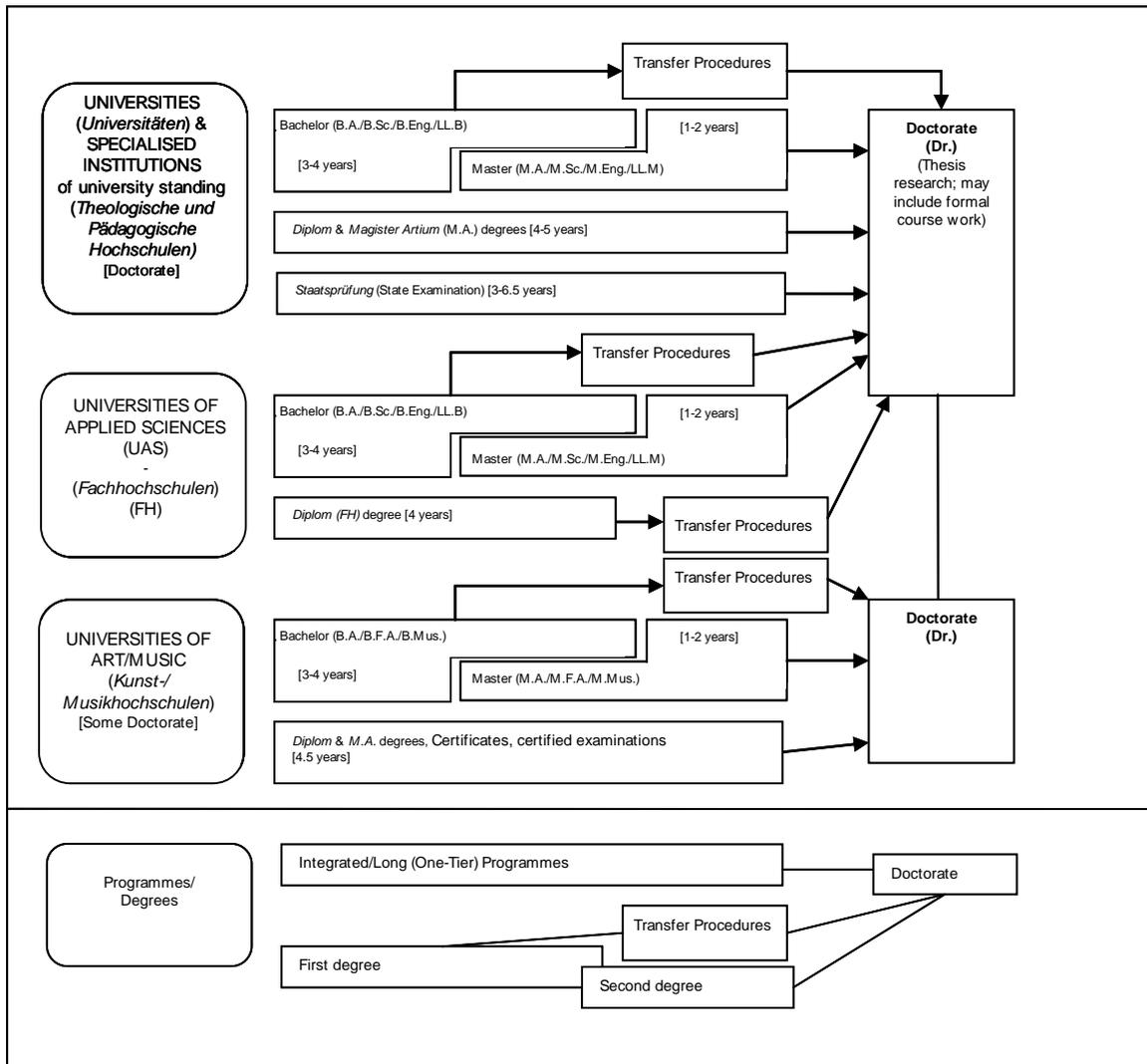
Higher Education Institutions are either state or state-recognised institutions. In their operations, including the organisation of studies and the designation and award of degrees, they are both subject to higher education legislation.

### 8.3.2 Types of Programmes and Degrees Awarded

Studies in all three types of institutions have traditionally been offered in integrated “long” (one-tier) programmes leading to *Diplom-* or *Magister Artium* degrees or completed by a *Staatsprüfung* (State Examination).

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<sup>1</sup> *Berufsakademien* are not considered as Higher Education Institutions, they only exist in some of the *Länder*. They offer educational programmes in close cooperation with private companies. Students receive a formal degree and carry out an apprenticeship at the company. Some *Berufsakademien* offer Bachelor courses which are recognised as an academic degree if they are accredited by a German accreditation agency.



**Institutions, Programmes and Degrees in German Higher Education**

Within the framework of the Bologna-Process one-tier study programmes are successively being replaced by a two-tier study system. Since 1998, a scheme of first- and second-level degree programmes (Bachelor and Master) was introduced to be offered parallel to or instead of integrated “long” programmes. These programmes are designed to provide enlarged variety and flexibility to students in planning and pursuing educational objectives, they also enhance international compatibility of studies.

### 8.3.3 Approval/Accreditation of Programmes and Degrees

To ensure quality and comparability of qualifications, the organisation of studies and general degree requirements have to conform to principles and regulations established by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (KMK).<sup>2</sup> In 1999, a system of accreditation for programmes of study has become operational under the control of an Accreditation Council at national level. All new programmes have to be accredited under this scheme; after a successful accreditation they receive the quality-label of the Accreditation Council.<sup>3</sup>

### 8.3.4 Organisation and Structure of Studies

The following programmes apply to all three types of institutions. Bachelor’s and Master’s study courses may be studied consecutively, at various higher education institutions, at different types of higher education institutions and with phases of professional work between

<sup>2</sup> Common structural guidelines of the *Länder* as set out in Article 9 Clause 2 of the Framework Act for Higher Education (HRG) for the accreditation of Bachelor’s and Master’s study courses (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 10.10.2003, as amended on 21.4.2005).

<sup>3</sup> Law establishing a Foundation “Foundation for the Accreditation of Study Programmes in Germany”, entered into force as from 26.2.2005, GV. NRW. 2005, nr. 5, p. 45 in connection with the Declaration of the *Länder* to the Foundation “Foundation: Foundation for the Accreditation of Study Programmes in Germany” (Resolution of the Standing Conference of the Ministers of Education and Cultural Affairs of the *Länder* in the Federal Republic of Germany of 16.12.2004).

the first and the second qualification. The organisation of the study programmes makes use of modular components and of the European Credit Transfer and Accumulation System (ECTS) with 30 ECTS corresponding to one semester.

### Bachelor

Bachelor degree study programmes lay the academic foundations, provide methodological skills and lead to qualifications related to the professional field. The Bachelor degree is awarded after 3 to 4 years.

First degree programmes (Bachelor) lead to Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), Bachelor of Engineering (B.Eng.), Bachelor of Laws (LL.B.), Bachelor of Fine Arts (B.F.A.) or Bachelor of Music (B.Mus.).

### Master

Master is the second degree after another 1 to 2 years. Master study programmes must be differentiated by the profile types "more practice-oriented" and "more research-oriented". Higher Education Institutions define the profile of each Master study programme.

The Master's degree study programme includes a thesis requirement. Study programmes leading to the Master's degree must be accredited according to the Law establishing a Foundation for the Accreditation of Study Programmes in Germany.<sup>4</sup>

Second degree programmes (Master) lead to Master of Arts (M.A.), Master of Science (M.Sc.), Master of Engineering (M.Eng.), Master of Laws (L.L.M), Master of Fine Arts (M.F.A.) or Master of Music (M.Mus.). Master study programmes, which are designed for continuing education or which do not build on the preceding Bachelor study programmes in terms of their content, may carry other designations (e.g. MBA).

### Integrated "Long" Programmes (One-Tier): Diplom degrees, Magister Artium, Staatsprüfung

An integrated study programme is either mono-disciplinary (*Diplom* degrees, most programmes completed by a *Staatsprüfung*) or comprises a combination of either two major or one major and two minor fields (*Magister Artium*). The first stage (1.5 to 2 years) focuses on broad orientations and foundations of the field(s) of study. An Intermediate Examination (*Diplom-Vorprüfung* for *Diplom* degrees; *Zwischenprüfung* or credit requirements for the *Magister Artium*) is prerequisite to enter the second stage of advanced studies and specialisations. Degree requirements include submission of a thesis (up to 6 months duration) and comprehensive final written and oral examinations. Similar regulations apply to studies leading to a *Staatsprüfung*. The level of qualification is equivalent to the Master level.

- Integrated studies at *Universitäten* (U) last 4 to 5 years (*Diplom* degree, *Magister Artium*) or 3 to 6.5 years (*Staatsprüfung*). The *Diplom* degree is awarded in engineering disciplines, the natural sciences as well as economics and business. In the humanities, the corresponding degree is usually the *Magister Artium* (M.A.). In the social sciences, the practice varies as a matter of institutional traditions. Studies preparing for the legal, medical, pharmaceutical and teaching professions are completed by a *Staatsprüfung*. The three qualifications (*Diplom*, *Magister Artium* and *Staatsprüfung*) are academically equivalent. They qualify to apply for admission to doctoral studies. Further prerequisites for admission may be defined by the Higher Education Institution, cf. Sect. 8.5.
- Integrated studies at *Fachhochschulen* (FH)/Universities of Applied Sciences (UAS) last 4 years and lead to a *Diplom* (FH) degree. While the FH/UAS are non-doctorate granting institutions, qualified graduates may apply for admission to doctoral studies at doctorate-granting institutions, cf. Sect. 8.5.
- Studies at *Kunst- and Musikhochschulen* (Universities of Art/Music etc.) are more diverse in their organisation, depending on the field and individual objectives. In addition to *Diplom/Magister* degrees, the integrated study programme awards include Certificates and certified examinations for specialised areas and professional purposes.

#### 8.3.5 Doctorate

Universities as well as specialised institutions of university standing and some Universities of Art/Music are doctorate-granting institutions. Formal prerequisite for admission to doctoral work is a qualified Master (UAS and U), a *Magister* degree, a *Diplom*, a *Staatsprüfung*, or a foreign equivalent. Particularly qualified holders of a Bachelor or a *Diplom* (FH) degree may also be admitted to doctoral studies without acquisition of a further degree by means of a procedure to determine their aptitude. The universities respectively the doctorate-granting institutions regulate entry to a doctorate as well as the structure of the procedure to determine aptitude. Admission further requires the acceptance of the Dissertation research project by a professor as a supervisor.

#### 8.3.6 Grading Scheme

The grading scheme in Germany usually comprises five levels (with numerical equivalents; intermediate grades may be given): "*Sehr Gut*" (1) = Very Good; "*Gut*" (2) = Good; "*Befriedigend*" (3) = Satisfactory; "*Ausreichend*" (4) = Sufficient; "*Nicht ausreichend*" (5) = Non-Sufficient/Fail. The minimum passing grade is "*Ausreichend*" (4). Verbal designations of grades may vary in some cases and for doctoral degrees.

In addition institutions may already use the ECTS grading scheme, which operates with the levels A (best 10 %), B (next 25 %), C (next 30 %), D (next 25 %), and E (next 10 %).

<sup>4</sup> See note No. 4.

### 8.3.7 Access to Higher Education

The General Higher Education Entrance Qualification (*Allgemeine Hochschulreife, Abitur*) after 12 to 13 years of schooling allows for admission to all higher educational studies. Specialised variants (*Fachgebundene Hochschulreife*) allow for admission to particular disciplines. Access to *Fachhochschulen* (UAS) is also possible with a *Fachhochschulreife*, which can usually be acquired after 12 years of schooling. Admission to Universities of Art/Music may be based on other or require additional evidence demonstrating individual aptitude. Higher Education Institutions may in certain cases apply additional admission procedures.

### 8.3.8 National Sources of Information

- Kultusministerkonferenz (KMK) [Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany]; Lennéstrasse 6, D-53113 Bonn; Fax: +49[0]228/501-229; Phone: +49[0]228/501-0
- Central Office for Foreign Education (ZaB) as German NARIC; <http://www.kmk.org>; E-Mail: zab@kmk.org
- Documentation and Educational Information Service as German EURYDICE-Unit, providing the national dossier on the education system (<http://www.kmk.org/doku/bildungswesen.htm>; E-Mail: eurydice@kmk.org)
- Hochschulrektorenkonferenz (HRK) [German Rectors' Conference]; Ahrstrasse 39, D-53175 Bonn; Fax: +49[0]228/887-110; Phone: +49[0]228/887-0; <http://www.hrk.de>; E-Mail: sekr@hrk.de
- "Higher Education Compass" of the German Rectors' Conference features comprehensive information on institutions, programmes of study, etc. (<http://www.higher-education-compass.de>)

## 8.4 Description of the Spanish Higher Education System

### 8.4.1 Higher Education Institutions in Spain

The Spanish University System is made up of two types of universities: public and private. According to the Organic Law 6/2001<sup>5</sup> of universities, the public universities are institutions created by the Law of the Legislative Assembly of the Autonomous Community, established within its jurisdiction and also those institutions created by Law by the Spanish Parliament, proposed by the government and in accordance to the Autonomous Community where the institution will be established. In contrast, Private Universities are those institutions created by physical persons or legal bodies in virtue of section 6 of article 27 of the Spanish Constitution, with respect to the constitutional principles and subject to the Organic Law 6/2001 of universities. There are also universities that are specialised in online studies that allow to study and obtain Bachelor's, Master's and Doctorate degrees (both public and private).

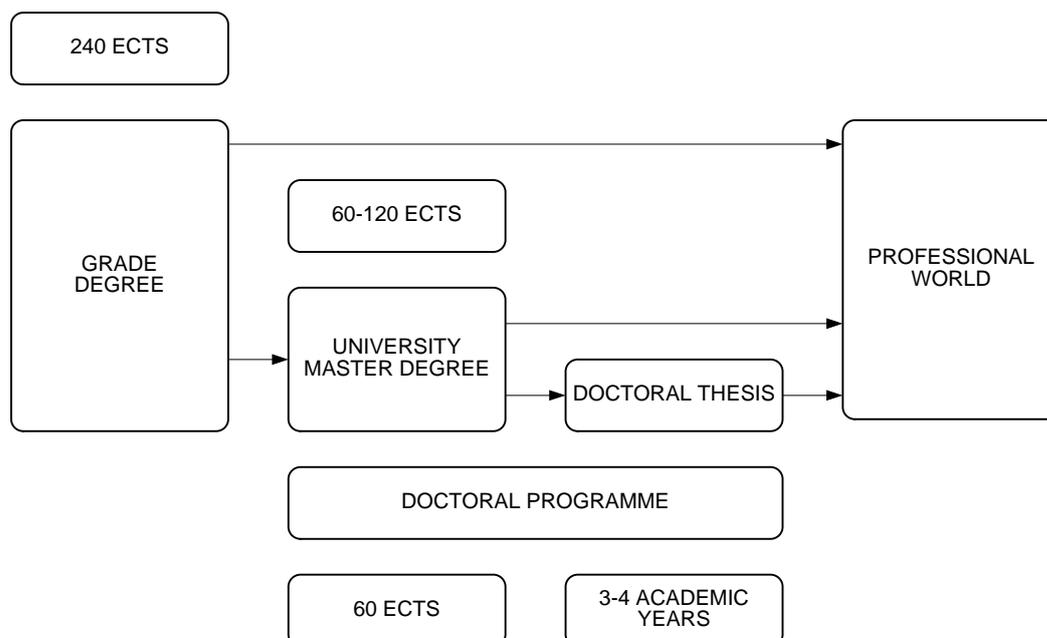
The educational policy is controlled by the Ministry of Education together with the departments of higher education in the universities. Within this framework, the "*Consejo de Universidades*" outlines the requirements to create new universities, centres, and institutes. In addition, it helps regulating advanced graduate studies. Universities are organised in Schools (*Facultades/Escuelas*), and within each School there are different Departments, which specialise in a specific part of the corresponding science.

### 8.4.2 Spanish Higher Education System

According to what is established in the Organic Law 6/2001<sup>2</sup>, within the autonomy of the universities, they can issue official degrees that are valid within the National territory, in addition to diplomas and non-official degrees.

- Official University degrees are valid in all National territory, are established by the Government and are adapted to the European Higher Education Area (EHEA). Therefore, they have official validity in all the countries that comprise the EHEA. These degrees are equivalent to/recognised in other countries that do not pertain to this area (like countries in Latin America, Asia, Africa, etc.).
- Meanwhile, non-official degrees are created by the university and do not have validity in the EHEA. Therefore they are not equivalent in other countries, but valid only by the same public or private university that has given the degree. The degrees may be differentiated by its denomination according to whether it is non-official or official. The denomination of the official university degrees are: **Bachelor's, Master's and Doctorate** while the denominations of the non-official university degrees are **Non-official Bachelor's Degree, Non-official Master's, Master's Specialist and Master's Expert**. Non-official Doctorates degrees do not exist.

Since the adaptation of the Spanish university system to the European Higher Education Area (EHEA), the structure of university studies in Spain now comprises three cycles: bachelor's degrees (in Spanish, *Grado*), master's degrees, and doctoral degrees. A graphical representation of the Spanish higher education system follows.



<sup>5</sup> [http://www.boe.es/diario\\_boe/txt.php?id=BOE-A-2001-24515](http://www.boe.es/diario_boe/txt.php?id=BOE-A-2001-24515)

### 1<sup>st</sup> Cycle: Bachelor's Degree

These are the first degree courses studied when students are admitted to universities. The aim of these courses of study is to provide students with a general knowledge of their chosen field, to prepare them for their future professional careers. The syllabi correspond to 240 ECTS and consist of theoretical and practical training, distributed as follows: basic degree knowledge, compulsory subjects, optional subjects, practical training in companies, and a bachelor's degree final project. University bachelor's degrees fall under one of the following branches of knowledge: Arts & Humanities, Science, Health Sciences, Social and Legal Sciences, and Architecture and Engineering.

### 2<sup>nd</sup> Cycle: Master's Degree

These begin following completion of a bachelor's degree. Master's degrees are intended to provide the student with advanced specialist or multidisciplinary training aimed at academic or professional specialisation, or to enable the student to embark on research projects. The syllabus corresponds to 60 or 120 ECTS (one or two years) and contains all the theory and practice the student must acquire, distributed as follows: compulsory subjects, optional subjects, seminars, practical training in companies, supervised assignments and a university master's degree final project. University master's degrees fall under one of the following branches of knowledge: Arts & Humanities, Science, Health Sciences, Social and Legal Sciences, and Architecture and Engineering.

### 3<sup>rd</sup> Cycle: Doctorates

Doctorates enable the student to gain the skills and abilities required for quality scientific research. Students are required to have passed an official master's degree and at least 300 ECTS between undergraduate and graduate official studies (or an equivalent qualification to a university master's degree issued by a higher education institution belonging to the EHEA<sup>6</sup>). The aim of doctoral programmes is to develop the different aspects of the PhD candidate's training and to establish the procedures and the line of research to enable them to produce a doctoral thesis. Doctoral programmes last for a maximum of three years, full time, from the admission of the PhD candidate to the programme to presentation of the thesis, or five years if the doctorate is studied on a part-time basis. To gain admission to an official doctoral programme, students must have an official bachelor's degree from a Spanish university, or equivalent degree, and a university master's degree, although individual universities may apply additional entry criteria requiring specific training.

To obtain the honorary mention of "European Doctorate", the doctorate student must have spent at least 3 months outside of Spain carrying out studies or conducting research; part of the thesis must be written and must be presented in one of the languages, other than Spain's official languages, of the European scientific community; the student must have had consultation regarding the thesis with at least two expert doctors from a non-Spanish European university or research centre; and on the thesis judging panel, at least one of the panellist experts must be from a non-Spanish European country.

Universities will be able to establish Doctorate Schools, which most properly focus and direct the doctoral training programmes carried out by each university, in addition to promoting collaboration with public and private research institutions or national and international businesses. For their part, the schools will facilitate the organisation of the doctoral programme around one or more branches of knowledge or across multiple disciplines. They will also attempt to attract a group of researchers with diverse backgrounds in order to improve their skills and broaden the competence of the doctoral students.

#### 8.4.3 The Spanish Credit System

ECTS credits (ECTS = European Credit Transfer and Accumulation System) are the standard adopted by all the universities in the European Higher Education Area (EHEA) in the process of convergence between Europe's higher education systems. ECTS credits are based on the work completed by the student, and cover hours of class, self-study, written work, and practical. An ECTS credit represents 25 hours of study. A student studying full-time is expected to obtain 60 ECTS credits in an academic year.

#### 8.4.4 Quality Assurance and Accreditation

The National Agency for Quality Assessment and Accreditation of Spain (ANECA) is a foundation whose aim is to provide external quality assurance for the Spanish Higher Education System and to contribute to its constant improvement. It was created on July 19, 2002 by agreement of the Council of Ministers.

ANECA is a full member of European Association for Quality Assurance in Higher Education (ENQA).

#### 8.4.5 Grading Scheme

The grading scheme in universities in Spain comprises a 10 point scale. The minimum passing grade is 5. In addition, institutions may already use the ECTS grading scheme, which operates with the levels A (best 10 %), B (next 25 %), C (next 30 %), D (next 25 %), and E (next 10%).

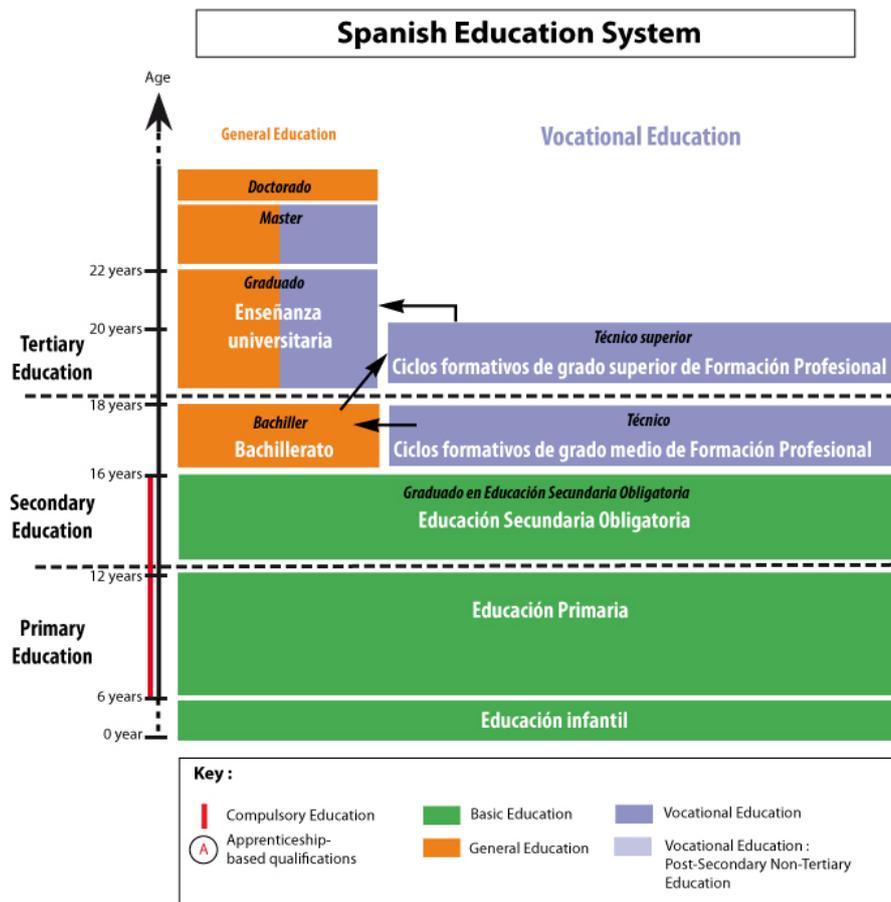
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<sup>6</sup> Access by a university qualification belonging to an educational system outside the EHEA must be legalised once the university has verified that the qualification is of a level equivalent to the corresponding official university master's degree in Spain and that it qualifies the student for admission to doctoral studies in the country in which the qualification was issued.

Spanish grading scale	10-9.0	8.9-8.0	7.9-7.0	6.9-6.0	5.9-5.0	4.9-3.1	3.0-0
ECTS grading scale	A	B	C	D	E	Fx	F

#### 8.4.6 Diagram of the Spanish Education System

The education system is defined by the Organic Law 2/2006<sup>7</sup>, May 4<sup>th</sup>. The Spanish education system is divided in three tiers: primary, secondary, and tertiary education. Preschool education (*"educación infantil"*) precedes the compulsory primary education (*"educación primaria"*) from 6 to 12 years and the compulsory secondary education (*"educación secundaria obligatoria"*) from 12 to 16 years. The completion of the compulsory first and secondary education awards the *"graduado en educación secundaria obligatoria"* degree. The post-compulsory secondary education from 16 to 18 years (higher education) is divided into the vocational education *"ciclos formativos de grado medio de formación profesional"* and the general education *"bachillerato"* degrees. Holders of the *"bachillerato"* degree have access to tertiary education. Tertiary education (from 18 years on) is also divided into general and vocational education. Holder of a tertiary vocational education (*"ciclos formativos de grado superior de Formación Profesional"*) degree have access to general education graduate degrees (*"enseñanza universitaria"*) but cannot enter master studies directly. Tertiary general education has been described in the previous sections.



#### 8.4.7 National Sources of Information

For more information about the Spanish University System Degrees, the official as well as the non-official, please visit <http://universidad.es/>, which also contains a search engine of degrees.

<sup>7</sup> <http://www.lamoncloa.gob.es/espana/eh14/educacion/Documents/LOE%202.2006.pdf>

## 8.5 Description of the Dutch Higher Education System

The higher education system in the Netherlands is based on a three-cycle degree system, consisting of a bachelor, master, and PhD. Until 2002, the first two cycles at research universities were combined in a single integrated cycle. The three-cycle system was officially introduced in the Netherlands at the beginning of the academic year 2002-2003, but degrees from the former, integrated system can be awarded until 2007-2009. For this reason, both the old and new systems will be described here.

The Netherlands has a binary system of higher education, which means there are two types of programmes: research oriented education (*wetenschappelijk onderwijs*, WO), traditionally offered by research universities, and professional higher education (*hogere beroepsonderwijs*, HBO), traditionally offered by *hogescholen*, or universities of professional education. In this description, the Dutch abbreviations WO and HBO will be used.

### 8.5.1 Primary and Secondary Education

Children are allowed to begin school at the age of four, but are not legally required to do so until the age of five. Primary education lasts eight years (of which seven are compulsory), in the last year of which pupils are advised as to the type of secondary education they should pursue.

Secondary education, which begins at the age of 12 and is compulsory until the age of 16, is offered at several levels. VMBO programmes (four years) combine general and vocational education, after which pupils can continue in senior secondary vocational education and training (MBO) lasting one to four years. The two programmes of general education that grant admission to higher education are HAVO (five years) and VWO (six years). Pupils are enrolled according to their ability, and although VWO is more rigorous, both HAVO and VWO can be characterised as selective types of secondary education. The VWO curriculum prepares pupils for university, and only the VWO diploma grants access to WO. The HAVO diploma is the minimum requirement for access to HBO. The last two years of HAVO and the last three years of VWO are referred to as the *tweede fase* (literally, second phase), or upper secondary education. During these years, pupils focus on one of four subject clusters (*profielen*), each of which emphasises a certain field of study in addition to satisfying general education requirements. Each cluster is designed to prepare pupils for programmes of study at the tertiary level. A pupil enrolled in VWO or HAVO can choose from the following subject clusters:

1. Science and Technology (*Natuur en Techniek*)
2. Science and Health (*Natuur en Gezondheid*)
3. Economics and Society (*Economie en Maatschappij*)
4. Culture and Society (*Cultuur en Maatschappij*)

### 8.5.2 Senior Secondary Vocational Education and Training (MBO)

Senior secondary vocational education and training (MBO, *secundair beroepsonderwijs*) is offered in the areas of economics, technology, health, personal care, welfare and agriculture. MBO programmes vary in length from one to four years as well as in level (1 to 4). Graduates of VMBO programmes are eligible for admission to MBO, and completion of MBO programmes at level 4 qualifies pupils for access to HBO.

### 8.5.3 Higher Education

Higher education in the Netherlands is offered at two types of institution: research universities (*universiteiten*) and universities of professional education (*hogescholen*). Research universities include general universities, universities specialising in engineering and agriculture, and the Open University. Research universities are primarily responsible for offering research-oriented programmes (*Wetenschappelijk Onderwijs*, WO). Universities of professional education include general institutions as well as institutions specialising in a specific field such as agriculture, fine and performing arts, or teacher training. Universities of professional education are primarily responsible for offering programmes of higher professional education (*Hoger Beroepsonderwijs*, HBO), which prepare students for particular professions. These tend to be more practically oriented than programmes offered by research universities.

#### WO until 2002

Dutch research universities provide education and conduct research in a wide range of disciplines: language and culture, behaviour and society, economics, law, medical and health sciences, natural sciences, engineering, and agriculture. Until 2002, initial study programmes lasted four years in most fields, but five years in agriculture, engineering, mathematics and most natural sciences, at the end of which the *doctorale getuigschrift* (doctoral degree) or *getuigschrift van het afsluitend examen* (final examination degree certificate) was awarded. Integrated study programmes in medical and health sciences lasted either five years (dentistry), or six years (medicine, pharmacy, veterinary medicine). The first year of every programme, referred to as the *propedeuse*, provided students with introductory courses fundamental to the field in question. In the years that followed, every doctoral programme featured training in research methodology and completion of a thesis as required components. Graduates of doctoral programmes have been permitted by law to use a particular title, depending on the discipline. Graduates in engineering and technology and in agriculture and the natural environment received the title of *ingenieur*, abbreviated to ir. Graduates in law obtained the title of *meester*, abbreviated to mr. Graduates in all other disciplines obtained the title of *doctorandus*, abbreviated to drs. All graduates could also opt to use the title Master (M.) if they wished. Graduation from a doctoral programme made one eligible to pursue a doctorate. All research universities in

the Netherlands were entitled to award the country's highest academic degree, the doctoraat, which entitles a person to use the title doctor, abbreviated to dr. The process by which a doctorate is obtained is referred to as the *promotie*. The doctorate is primarily a research degree, for which a dissertation based on original research must be written and publicly defended. The minimum amount of time required to complete a doctorate was four years.

#### HBO until 2002

Dutch universities of professional education prepare students for a wide variety of careers in seven sectors: agriculture, engineering and technology, economics and business administration, health care, fine and performing arts, education (teacher training), and social welfare. Initial study programmes lasted four years, at the end of which the *Getuigschrift Hoger Beroepsopleiding* or HBO degree was awarded. The first year of every programme, referred to as the *propedeuse*, consisted of introductory courses fundamental to the discipline in question. In addition to lectures, seminars, projects and independent study, students were required to complete an internship or work placement (stage) which normally takes up part of the third year of study, as well as a final project or a major paper in the fourth year. Graduates of an HBO programme in engineering and technology or agriculture and the natural environment received the title of *ingenieur*, abbreviated to ing. Graduates in all other disciplines obtained the title of *baccalaureus*, abbreviated to bc. All graduates could also opt to use the title Bachelor (B.), if they wished. HBO graduates are fully qualified to practice their profession without any further study, licensing, or registration with a professional association.

#### After 2002

Since September 2002, the higher education system in the Netherlands has been organised around a three-cycle degree system consisting of bachelor, master, and PhD degrees. At the same time, the ECTS credit system was adopted as a way of quantifying periods of study. The higher education system continues to be a binary system, however, with a distinction between research-oriented education (*wetenschappelijk onderwijs*, WO) and professional higher education (*hoger beroepsopleiding*, HBO).

The focus of degree programmes determines both the number of credits required to complete the programme and the degree which is awarded. A WO bachelor's programme requires the completion of 180 ECTS (3 years) and graduates obtain the degree Bachelor of Arts or Bachelor of Science (BA/BSc), depending on the discipline. An HBO bachelor's programme requires the completion of 240 ECTS (4 years), and graduates obtain a degree indicating the field of study (for example, Bachelor of Engineering, B. Eng., or Bachelor of Nursing, B. Nursing). The old title appropriate to the discipline in question (bc., ing.) may still be used. Institutions offer WO master programmes that in most cases require the completion of 60 or 120 ECTS (1 or 2 years). Some programmes require 90 (1,5 years) or more than 120 ECTS. In engineering, agriculture, and math and the natural sciences, 120 ECTS are always required. Graduates obtain the degree of Master of Arts or Master of Science (MA/MSc). The old title appropriate to the discipline in question (drs., mr., ir.) may still be used. An HBO master programme requires the completion of 60 to 120 ECTS and graduates obtain a degree indicating the field of study (for example, Master of Social Work, MSW).

The third cycle of higher education, leading to a doctor's degree, will be offered only by research universities in the same way as described above.

#### 8.5.4 Requirements for Admission to Higher Education

For access to WO bachelor's programmes, students are required to have a VWO diploma or to have completed the first year (60 ECTS) of an HBO programme. The minimum access requirement for HBO is either a HAVO diploma or a level-4 MBO diploma. The VWO diploma also grants access to HBO. For access to both types of higher education, pupils are required to have completed at least one of the subject clusters that fulfills the requirements for the higher education programme in question. A quota, or *numerus fixus*, applies for access to certain programmes, primarily in the medical sciences, and places are allocated using a weighted lottery. Potential students older than 21 years of age who do not possess one of the qualifications mentioned above can qualify for access to higher education on the basis of an entrance examination and assessment. The only access requirement for the Open University is that applicants be at least 18 years of age.

For access to all master programmes, a bachelor's degree in one or more specified disciplines is required, in some cases in combination with other requirements. Graduates with an HBO bachelor's degree may have to complete additional requirements for access to a WO master's degree programme.

#### 8.5.5 Credit System and Grading

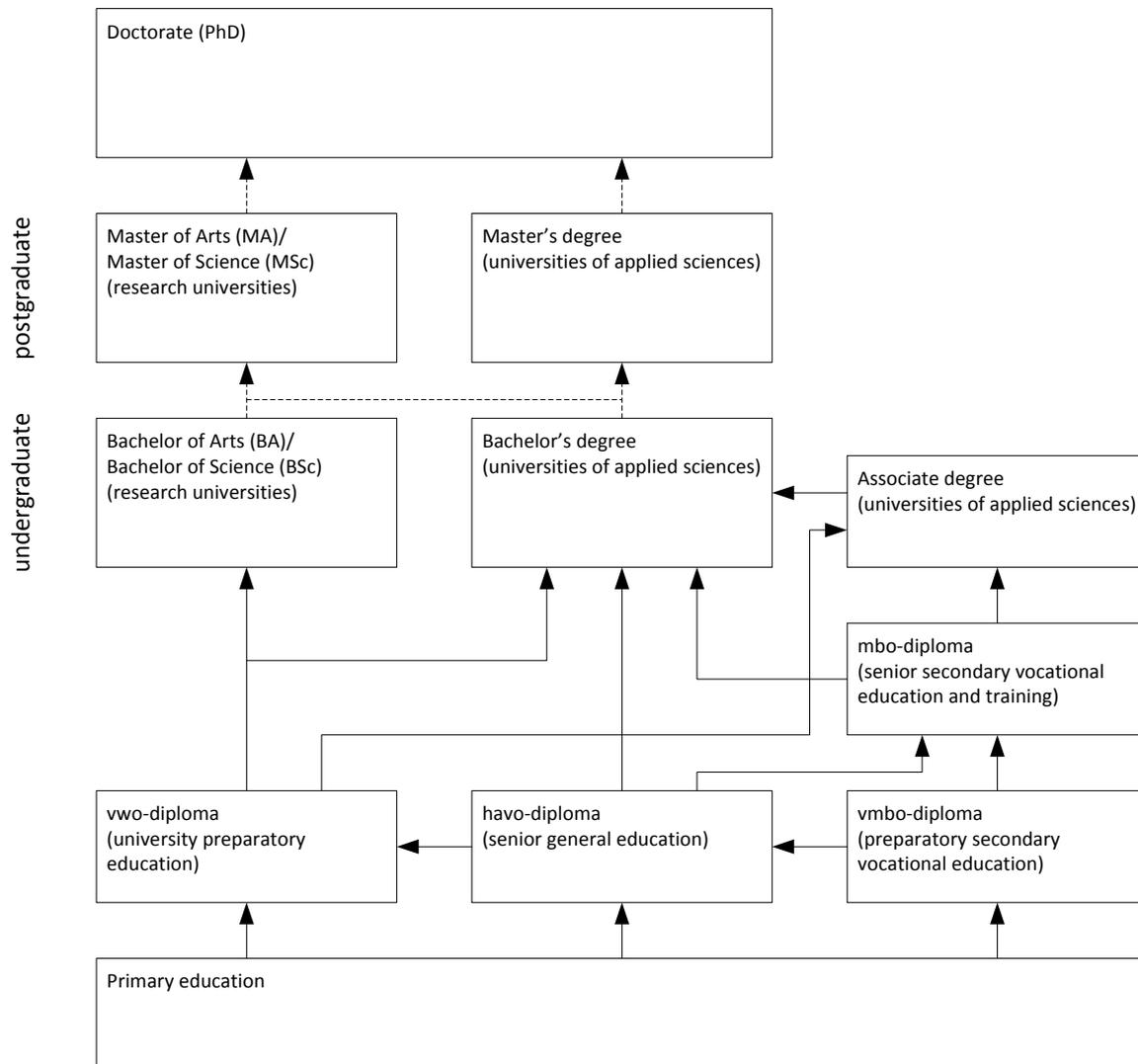
Workload is measured in credits (*studiepunten*). Until 2002, one credit represented one week of full-time study (40 hours, counting both contact hours and hours spent studying and preparing assignments). Study programmes offered by research universities and universities of professional education lasting four years required completion of a total of 168 credits, or 42 credits per year. The academic year was (and still is) 42 weeks long. Since 2002, a student's workload is measured in ECTS credits, whereby -according to Dutch law- one credit represents 28 hours of work and 60 ECTS represents one year of full-time study.

The grading system has been the same for several decades: the scale is from 1 (very poor) to 10 (outstanding). The lowest passing grade is 6; 9s are seldom given and 10s are extremely rare and grades 1-3 are hardly ever used.

#### 8.5.6 Accreditation and Quality Assurance

A guaranteed standard of higher education is maintained through a national system of legal regulation and quality assurance. The Ministry of Education, Culture and Science is responsible for legislation pertaining to education. The agriculture and public health ministries play an important role in monitoring the content of study programmes in their respective fields, and until 2002, the VSNU (Association of Universities in the Netherlands) and the HBO-raad (Netherlands Association of Universities of Professional Education) were responsible for implementing the system of quality assurance. This system has been recently converted to a system of accreditation. As of 2002, responsibility for accreditation lies within the Netherlands- Flemish Accreditation Organisation (NVAO). According to the section of the Dutch Higher Education Act dealing with the accreditation of higher education (2002), all degree programmes offered by research universities and universities of professional education will be evaluated according to established criteria, and programmes that meet those criteria will be accredited: i.e., recognised for a period of six years. Only accredited programmes will be eligible for government funding, and students will receive financial aid and graduate with a recognised degree only when enrolled in, or after having completed, an accredited degree programme. Accredited programmes will be listed in the Central Register of Higher Education Study Programmes (CROHO) and the information will of course be available to the public. The NVAO plans to review all study programmes by 2006. Before that time, all programmes that are registered in CROHO that have adhered to the quality assurance regulations, are considered to be recognised by law. Besides the accreditation of degree programmes, the Netherlands has a system by which the Ministry of Education, Culture and Science recognises higher education institutions by conferring on them the status of either *bekostigd* (funded) or *aangewezen* (approved). *Bekostigd* indicates that the institution is fully financed by the government. *Aangewezen* indicates that the institution does not receive funds from the government and has to rely on its own sources of funding. Whether a degree programme is offered by a 'funded' or an 'approved' institution, it must be accredited and registered in CROHO to be considered recognised. According to legislation regarding accreditation, institutions are required to write on degree certificates the date that the degree programme in question was granted accreditation. At this stage, only few programmes have actually been accredited. Because accreditation is an ongoing process, it will be important that people who review Dutch degrees make sure that a programme was accredited at the time the degree was awarded. Once accredited, the validity of the accreditation of that particular degree is of course permanent.

### 8.5.7 Diagram of the Dutch Education System



### 8.5.8 National Sources of Information

- Website of TU/e: <https://www.tue.nl/en/>
- Website for education in the Netherlands: <https://www.studyinholland.nl/>
- Website of the NARIC centre: <http://www.nuffic.nl/>

## ANNEX TO THE SUPPLEMENT

Personal transcript relative to the path followed by the student

### Grade Transcript:

ECTS classification system: A the 10% best, B the 25% following, C the 30% following, D the 25% following, E the remaining 10%. F is reserved to mark a failed course.

Results of the first year of LAST NAME First Name during the academic year 201x/201x: Master of science in Computer science and engineering, Specialisation Big Data Management and Analytics (Erasmus Mundus)

Course code	Course name	Grade	ECTS Grade	ECTS Credits
<b>Compulsory courses</b>				
INFO-H-415	Advanced Databases	xx	X	5
INFO-H-417	Database Systems Architecture	xx	X	5
INFO-H-419	Data Warehouses	xx	X	5
INFO-H-420	Business Process Management	xx	X	5
INFO-H-421	Data Mining	xx	X	5
INFO-Y-400	Big Data Management	xx	X	6
INFO-Y-401	Semantic Data Management	xx	X	6
INFO-Y-402	Cloud Computing	xx	X	6
INFO-Y-403	Viability of Business Project	xx	X	6
INFO-Y-404	Big Data Seminar	xx	X	2
INFO-Y-422	Humanities: Ethics of Information	xx	X	2.5
INFO-Y-405	Humanities: Social and Ethical Impact of Big Data	xx	X	2
LANG-H-400	Humanities : French Language	xx	X	2.5
LANG-Y-400	Humanities : Spanish Language	xx	X	2

Total number of credits obtained	60 ECTS
Weighted average of the year	xx,xx/20
Mention of the year	XXXXXXXXXX
Deliberation date of the jury	xx/xx/201x
Classification of the student	X

Results of the second year of LAST NAME First Name during the academic year 201x/201x: Master of science in Computer science and engineering, Specialisation Big Data Management and Analytics (Erasmus Mundus)

Course code	Course name	Grade	ECTS Grade	ECTS Credits
<b>Compulsory courses</b>				
MEMO-H-510	Master's Thesis Preparation	xx	X	5
MEMO-H-511	Master's Thesis	xx	X	25
<b>Optional courses</b>				
INFO-Y-505	Scalable Data Science	xx	X	6
INFO-Y-506	Big Data Analytics Project	xx	X	6
INFO-Y-507	Management of Data Streams	xx	X	9
INFO-Y-508	Big Data Analytics Seminar	xx	X	3
LANG-Y-501	Humanities : Interdisciplinary Communication	xx	X	6

Total number of credits obtained 60 ECTS  
Weighted average of the year xx,xx/20  
Mention of the year XXXXXXXX  
Deliberation date of the jury xx/xx/201x  
Classification of the student X

Results obtained by the student for the entire cycle:

Total number of credits obtained 120 ECTS  
Weighted average of the cycle xx,xx/20  
Mention of the cycle XXXXXXXX  
General classification of the student X

Brussels, Day Month 20xx

Secretary of the Jury,

ULB Seal

FirstName LASTNAME