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UNIVERSITÀ DI BOLOGNA



School of Engineering and Architecture – Cesena Campus
LAUREA MAGISTRALE (SECOND CYCLE
DEGREE/TWO YEAR MASTER - 120
ECTS) IN BIOMEDICAL ENGINEERING
A.Y. 2013/2014

Programme Director Prof. LAMBERTI CLAUDIO

REPORT

Study Programme Report
Biomedical Engineering
Programme ex D.M. 270/04 - Code 8198 - Class LM-21
School of Engineering and Architecture – Cesena Campus
Programme Director Prof. LAMBERTI CLAUDIO

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WHAT IS THE STUDY PROGRAMME REPORT?

What is the Study Programme Report?

The Study Programme Report provides updated information which is important for the purposes of Quality Assurance and is published annually by the University of Bologna.

The main aspects of the teaching programme are described in detail, with a view to assuring the principle of transparency and promoting self-assessment and continuous improvement processes.

The document provides a concrete overview of the features and results of the Study Programme for students, families, employers and so on.

For example, regarding the current issue of employment, it describes the learning outcomes and career opportunities; it also includes statistics on the percentage of employed graduates (D.4. Employment situation).

The document is organised into five sections and a glossary:

A. Presentation and prospects

Key information on the Study Programme, including the expected learning outcomes, career opportunities and further studies.

B. Teaching and Learning

The updated course structure diagram with the full titles and listings of the course units and the latest published lecture timetable.

C. Resources and services

The list of teaching staff and their relative curricula, the offices (secretariats), services (work placements) and infrastructures (libraries, laboratories) available to students.

D. The Study Programme in Figures

Key data shows how many students are enrolled, how many have been assigned additional learning requirements, how many drop out after the first year, how many graduate in line with the programme schedule, the opinions of attending and graduating students on the teaching programmes and information concerning graduate employment.

E. Find out more: the quality of your Study Programme

How the quality system applied to your Study Programme works. The quality system of your Study Programme is a set of processes and responsibilities adopted to guarantee the quality of all Study Programmes at the University of Bologna.

NOTES:

- Reports are available for all Study Programmes for which it is possible to enrol in the first year in academic year 2012/2013: the information and data provided is as updated as possible.
- Sections A, B and C provide data for the academic year 2012/2013.
- Section D presents data regarding the Study Programmes in the last three academic years.
- The information and data were taken from the University databases and the reports published by the [Statistical Observatory of the University of Bologna](#) and [AlmaLaurea](#), and are updated to **15 June 2012**.

A. PRESENTATION AND PROSPECTS

This section presents the key information concerning the Study Programme, including the expected learning outcomes, career opportunities and further studies, updated to the academic year 2013/2014.

A.1. PRESENTATION

This paragraph provides information on the specific learning outcomes of the Study Programme and the curriculum.

The 2nd cycle degree programme in Biomedical Engineering aims to provide students with a solid cultural and professional background to operate in highly qualified areas of the biomedical engineering field.

2nd cycle graduates in Biomedical Engineering have a high level of cultural and professional understanding of the specific subjects in this class, in particular concerning the innovative design of biomedical devices for diagnosis, therapy and rehabilitation, the analysis of complex biological systems, data and image processing, management of clinical engineering services. Ample space will be reserved for the learning of modern assisted design, modelling and simulation methods.

The 2nd cycle degree programme in Biomedical Engineering aims specifically to train professional figures able to occupy positions of responsibility in industrial, management and/or research functions in public and private boards and companies, as well as the highly professional activities within the freelance field.

The computing and experimental equipment available for use in the university laboratories, which is being further enhanced, allows for the study of fields of application. Activities may also be carried out in collaboration with public and private bodies and companies operating in the territory.

Among others, the professional figures described below (tables A and B) may be developed.

The Biomedical Engineering study programme produces graduates with a solid cultural background and in-depth technical and scientific knowledge they can successfully put to use in the world of work or continue to develop by continuing studies to 2nd cycle Master's Degree level or PhD programmes in Bioengineering and similar disciplines.

Having passed the state examination, in compliance with the applicable regulations, graduates in biomedical engineering may exercise the private profession (feasibility studies, design, technical arbitration, technical expert for parties and on behalf of the courts, etc.), also dealing with complex issues which require great skill.

A.2. ADMISSION REQUIREMENTS

This paragraph provides information on the knowledge required for admission to the Study Programme.

Admission to the 2nd cycle degree programme is subject to the possession of the following requirements:

CURRICULAR REQUIREMENTS

1. One of the following degrees:

- Degree under ex. DM270/2004
- Degree under ex. DM509/1999
- Three year university degree under the previous system
- (Four or five year) university degree under the previous system
- other suitable and recognised qualification obtained abroad.

2. At least

- 36 CFU in scientific-disciplinary fields pertaining to the basic learning activities in class L-8 of Information Engineering degrees and in class L-9 for Industrial Engineering degrees under DM 16-3-2007 The university degree classes are laid down in the Official Journal no. 155 of 6th July 2007, S.O.;

(for ease of reference the list of considered SSDs is given below:

INF/01 Computing,

ING-INF/05 Information Processing Systems

MAT/02 Algebra

MAT/03 Geometry

MAT/05 Mathematical Analysis

MAT/06 Probability and Mathematical Statistics

MAT/07 Mathematical Physics

MAT/08 Numerical Analysis

MAT/09 Operative Research

SECS-S/02 Statistics for Experimental and Technological Research

CHIM/03 General and Inorganic Chemistry

CHIM/07 Chemical Foundation of Technologies

FIS/01 Experimental Physics

FIS/03 Matter Physics)

- 10 CFU acquired in one of the following scientific-disciplinary fields:

ING-INF/01 Electronics

ING-INF/03 Telecommunications

ING-INF/04 Automatics

- 10 CFU acquired in one of the following scientific-disciplinary fields:

ICAR/08 Building Science

ING-IND/10 Industrial Technical Physics

ING-IND/14 Mechanical Design and Machine Construction

ING-IND/22 Material Science and Technology

ING-IND/31 Electrotechnics

ING-IND/13 Mechanics Applied to Machines

ING-IND/12 Thermal and Mechanical Measurements

- 20 CFU in scientific-disciplinary fields pertaining to the specific learning activities in the Biomedical Engineering field, as laid down in the degree programme system governing the three-year degree in Biomedical Engineering, under ex DM270/2004, of the University of Bologna:

ING-INF/06 Electronic and Informatic Bioengineering

ING-IND/34 Industrial Bioengineering

For degrees obtained in Italy under previous degree programme systems or suitable qualifications obtained abroad, the studies completed within such programmes will be allocated to the scientific-disciplinary fields, assessed in terms of credits and recognised by the Degree Programme Board in order to verify the compliance with the curricular requirements, following the criteria laid down in Art. 8 below.

TEST TO VERIFY PERSONAL ACADEMIC PREPARATION

Admission to the 2nd cycle degree programme is subject to the possession of the described curricular requirements and to the passing of a test to verify the students' personal academic preparation, which will be done through the assessment of the candidates' curriculum.

Personal academic preparation will be automatically accepted for candidates complying with at least one of the following criteria:

- i) University Degree or Diploma under the previous system with at least 30 CFU in the scientific-disciplinary fields ING-INF/06 and ING-IND/34 whatever the final degree score;
- ii) Degree or Diploma with a minimum final score of 90/110 or equivalent;
- iii) An average weighted credit score of the exams passed in the scientific-disciplinary sectors of "Biomedical Engineering" laid down for recognition of the curricular requirements equal to at least 25/30.

A.3. LEARNING OUTCOMES

This paragraph provides information on the knowledge and skills students will have acquired by the end of the Programme.

KNOWLEDGE AND UNDERSTANDING:

2nd cycle graduates in Biomedical Engineering will possess in-depth knowledge of the methodological and operative aspects of mathematics, basic science and information engineering. They will have a sound knowledge of physiology, biochemistry and mechanical engineering. They will have in-depth knowledge of the advanced aspects of modelling of complex systems, design of healthcare equipment, biomechanics and biomaterials. They will be able to use this knowledge to interpret and describe highly complex biomedical engineering problems, identifying innovative and non conventional solutions, even when faced with completely new problems.

The aforementioned knowledge and understanding are achieved through participation in lectures, practical exercises, seminars, guided self-study and individual study required in the various learning activities, in particular those related specifically to this discipline.

Supplementary activities will support the learning to further develop the basic knowledge acquired during the 1st cycle degree.

Assessment of the achievement of the described learning outcomes shall be mainly through written and oral exams.

ABILITY TO APPLY KNOWLEDGE AND UNDERSTANDING:

2nd cycle graduates:

- will have in-depth knowledge of the analysis techniques applied to complex biological systems, assessing the most appropriate mathematical and simulation tools and suitable data and signal processing techniques;
- will know the techniques and instruments used to design conventional and innovative biomedical equipment, image processing techniques, advanced methods for the design and use of prostheses;
- will be able to interact with doctors and biologists to analyse complex problems, recommend the correct management of equipment, provide advice on the innovative use of diagnostic systems and equipment;
- will be able to participate autonomously in biomedical experimentation, research and development activities;

- will be able to skilfully participate in the sale of biomedical equipment together with sales staff, suggesting improvements and adaptations, taking autonomous initiatives and competently interpreting the needs of the purchaser in order to transform them into appropriate design specifications;
- will be able to manage clinical engineering services, identifying the most appropriate techniques for the management and exploitation of healthcare equipment.

The achievement of the ability to apply this knowledge and understanding will be accomplished through the critical study of examples and exercises relative to texts proposed for self-study, stimulated by classroom activities, the research of case studies and applications presented by the professors, calculations and practical laboratory and computer study, bibliographic research and field work, individual and/or group projects related in particular to the key learning activities in scientific sectors ING-INF/06 – Electronic and Informatic Bioengineering and ING-IND/34 – Industrial Bioengineering, as well as through the preparation of the final examination.

The written and oral exams, reports, practical work and problem solving activities imply the execution of specific tasks which aim to demonstrate the student's command of tools, methods and critical autonomy.

JUDGEMENT SKILLS:

2nd cycle graduates:

- will be able to identify, formulate and solve problems linked to the design or production of biomedical equipment, also where relative to innovative articles by company standards;
- will be able to keep abreast of the developments in methods, techniques and instruments in the field of biomedical engineering, autonomously researching or following training courses aimed at the acquisition of additional skills;
- will be able to analyse complex biological systems, and propose alternative and innovative methodologies compared to those commonly used in the biomedical field, or critically debating the standard techniques.

The acquisition of judgement skills is assessed during the discussion of the advanced areas of the subject during oral exams, through written exercises and laboratory tests, as well as during the preparation of the final examination.

COMMUNICATION SKILLS:

Graduates are able to effectively communicate orally and in writing both in Italian and at least English, to a high level of knowledge.

They will be able to work and participate in working groups also acting as manager or coordinator; they will therefore be able to interact with subjects and professions other than their own.

The acquisition of these communication skills is assured not only through written and oral tests, which require the ability to coherently and organically present key topics, but also through the production of a final dissertation and its discussion, and during the production of a final report and/or scientific papers required during the advanced course units. Knowledge of the English language is developed during seminars and through the study of written texts proposed by the professor, and during bibliographic research (e.g. during the final examination).

LEARNING SKILLS:

2nd cycle graduates will develop learning skills to such a high level that they will be able to autonomously keep abreast of the methods, techniques and instruments in the Biomedical Engineering field, in the conventional and innovative design of biomedical equipment, modelling and simulation of complex biological systems, design and correct use of prostheses and rehabilitation techniques, use of advanced data processing techniques, as well as continuing studies to a high level of autonomy (e.g. 2nd level Master's degree or PhD programmes) and/or in the field of research or other academic activities.

Learning skills are acquired throughout the study period as a whole, throughout all the learning activities, using different strategies particularly concerning self-study, the production of individual projects and exercises and laboratory activities, as well as the activities implemented in preparation of the final examination.

Learning skills are evaluated through continuous assessment during the learning activities, which may require the presentation of autonomously researched data during exercises and laboratory work, through the production of essays and/or projects and the evaluation of the activities relative to the preparation of the final examination.

A.4. CAREER OPPORTUNITIES

This paragraph provides information on the occupational profile, functions and fields of employment available to graduates of this Programme.

Biomedical Engineer (ISTAT 2.2.1.9.4)

Highly qualified Expert and/or Manager of medical-biological systems modelling and advanced virtual simulation:

- Participates in scientific research projects in both the industrial field (above all in research and development institutes) and advanced laboratories, integrating basic engineering knowledge with relevant bioengineering skills.
- Uses advanced computer simulation methods and virtual simulation graphic techniques in order to simulate, analyse and understand the operation of biological systems.
- Deals with experimental activities, defining conventional and innovative measuring techniques, defining measuring protocols, analysing data, and proposing theoretical interpretations.

Highly qualified Expert and/or Manager of industrial activities for the design and production of biomedical devices.

- Involved in complex modelling and design tasks for equipment components, machines and production systems in the biomedical industry.
- Follows innovative and complex products during the various phases of the production process.
- Plans and monitors the reliability and quality of biomedical equipment production, and at the same time, assures innovation and positioning in the most advanced product markets.

Highly qualified Expert and/or Manager of clinical engineering services.

- Manages the purchase, testing and maintenance of healthcare equipment, holding positions of responsibility in clinical engineering services technical departments, assessing the costs and benefits of innovative technologies.
- Manages and designs also innovative software for the management of equipment, goods inventories, management of patient records.
- Manages healthcare equipment safety, assessing the environmental effects and impact on healthcare staff and patients.
- Assures training of healthcare staff in the use of advanced and complex equipment.

Highly qualified Expert and/or Manager of the design and production of advanced prostheses, biomedical systems and rehabilitation techniques.

- Deals with the study of mechanical behaviour of prostheses and biomaterials, as well as innovative modelling and design techniques for advanced neuro-prostheses.
- Is able to analyse data on human movement and suggest/test innovative rehabilitation and motor improvement techniques in both clinical and industrial fields and relating to sports medicine.
- Analyses complex biomechanical systems, also using advanced computer simulation techniques.

Highly qualified Expert and/or Manager of the development of innovative procedures for the identification of diagnostic techniques and the processing of biomedical data.

- Models and designs advanced diagnostic systems in the industrial field, in research and development centres, in avant-garde clinical centres, integrating knowledge of physiology and medicine and knowledge of traditional engineering sectors with in-depth bioengineering knowledge.
- Implements and develops advanced data analysis methods in clinical and industrial fields, using innovative signal processing techniques, statistical methods and graphic tools.
- Deals with image processing, suggesting innovative technologies, highlighting their potential and limits, proposing and implementing new image processing methods, also improving on the state of the art.

Graduates of the 2nd cycle degree programme in Biomedical Engineering will be able to operate professionally in production innovation and development, advanced design, planning and programming, management of complex systems, both freelancing and as employees in manufacturing and service industries and in the civil service. Graduates of the 2nd cycle degree programme in Biomedical Engineering will be able to interact with healthcare professionals each in their respective field of competency, for diagnostic and therapeutic applications. Graduates may find work in biomedical and pharmaceutical industries, producers and suppliers of systems, equipment and materials for prevention, diagnosis, treatment and rehabilitation; public and private hospitals and clinics; services companies managing medical equipment and systems, telemedicine; specialist clinical laboratories.

Local fields of employment

In the Emilia-Romagna Region there is a large concentration of small and medium enterprises working in the biomedical sector, with an extremely advanced industrial system with a strong international vocation. Moreover, the regional system is characterised by highly technologically developed public and private healthcare structures, as well as research bodies of international renown. The skills developed during the 2nd cycle degree programme in Biomedical Engineering offer a broad base of engineering skills that are particularly requested and appreciated not only in the specific industrial sector but also other technological areas.

In particular, the Emilia Romagna Region offers the following specific fields of employment:

- biomedical industries for the design and production of medical diagnosis, treatment and rehabilitation devices;
- biomedical industries for the design and production of prostheses;
- diagnostic software and clinical management companies;
- consulting services for the management of clinical engineering services;
- research bodies studying complex biomedical systems;
- hospitals, in the technical departments and clinical engineering services;
- biomedical research laboratories.

A.5. OPINION OF SOCIAL PARTNERS AND POTENTIAL EMPLOYERS

This paragraph describes the outcome of the consultation with the representative employment and trade organisations.

This information is not available in English at this time.

A.6. FURTHER STUDIES

It gives access to third cycle studies (Dottorato di ricerca/Scuole di specializzazione) and master universitario di secondo livello.

B. TEACHING AND LEARNING

This section describes the updated course structure diagram (for academic year 2013/2014), with the full titles and listings of the course units and the latest published lecture timetable.

B.1. COURSE STRUCTURE DIAGRAM

The link takes you to the Study Programme course structure diagrams. You can also access to each course unit content.

- [Study plan: all course units in the programme](#)

B.2. CALENDAR AND LECTURE TIMETABLE

The links take you to the teaching calendar (exam session and final examination session) and the lecture timetable (in Italian).

- [Lecture timetable](#)
- [Exam sessions](#)
- [Final examination sessions](#)

C. RESOURCES AND SERVICES

This section provides a list of teaching staff and their relative curricula and and description of the services available to students for the academic year 2013/2014.

C.1. TEACHERS

The paragraph lists the lecturers who teach in the Study Programme: from here you can access the personal web pages of each one (in Italian). Information updated to 28 May 2013 (in Italian).

Permanent teaching staff:

Cappello, Angelo	Cristofolini, Luca	Marcelli, Emanuela	Stagni, Rita
Chiari, Lorenzo	Giordano, Emanuele	Montefusco, Laura	Tartagni, Marco
Corsi, Cristiana	Domenico	Morigi, Serena	Ursino, Mauro
Costanzo, Alessandra	Gnudi, Gianni	Severi, Stefano	
	Magosso, Elisa		

Contract teaching staff:

[Leardini, Alberto](#)
[Pani, Martino](#)

C.2. STUDENT SERVICES: OFFICES

C.2.1. FUTURE STUDENTS

The link take you to the webpage which provides specific information about the offices and the services for the future students (in italian).

- [Future students](#)

C.2.2. ENROLLED STUDENTS

The link take you to the webpage which provides specific information about the offices and the services for the enrolled students (in italian).

- [Enrolled students](#)

C.2.3. INTERNATIONAL STUDENTS

The links take you to the reference Work Placement and International Relations office for the Study Programme, where available.

- [International students](#)

C.2.4. GRADUATES

- [Graduates](#)

D. THE STUDY PROGRAMME IN FIGURES

Information on students' starting their university careers, how many students are in line with the regular programme, opinions of students and graduates on the teaching programmes and information concerning graduate employment.

This section provides the data of the last academic years for the Study Programme (SP) and a comparison with similar Study Programmes. The University of Bologna has divided its Study Programmes into four groups:

- **BIOMEDICAL** group: Study Programmes of the Schools of Pharmacy, Biotechnology and Sport Science; Medicine; Agriculture and Veterinary Medicine
- **SCIENTIFIC-TECHNOLOGICAL** group: Study Programmes of the Schools of Engineering and Architecture; Sciences
- **SOCIAL SCIENCES** group: Study Programmes of the Schools of Economics, Management, and Statistics; Law, Political Sciences
- **HUMANITIES** group: Study Programmes of the Schools of Arts, Humanities, and Cultural Heritage; Foreign Languages and Literatures, Interpreting and Translation; Psychology and Education

The section presents the results of the Study Programme for the last three academic years.

Main data shows how many students enrolled, the number of students assigned OEA, how many drop out after the first year, how many graduate in line with the programme schedule, the opinions of attending and graduating students on the teaching programmes and information concerning graduate employment.

The information and data presented in this section, updated to 28 May 2013, were taken from University databases and [AlmaLaurea](#).

Study Programmes may be subject to degree programme system modifications from one academic year to the next, and the data provided in this section may refer to a programme with a slightly different system to the one currently running (such as programme title, course structure diagram and list of lecturers). However, indicatively the data presents the general trend of the Study Programme over the past three years.

Most of the Study Programmes running at the University of Bologna have been reformed in compliance with DM 270/04, most of them from the academic year 2008/2009. For this reason for the previous academic years for some information, as opinion of the graduates and employment situation, are provided in the reports of those Programmes, on the paragraph D.5. refers to the Study Programmes as they were presented prior to the reform.

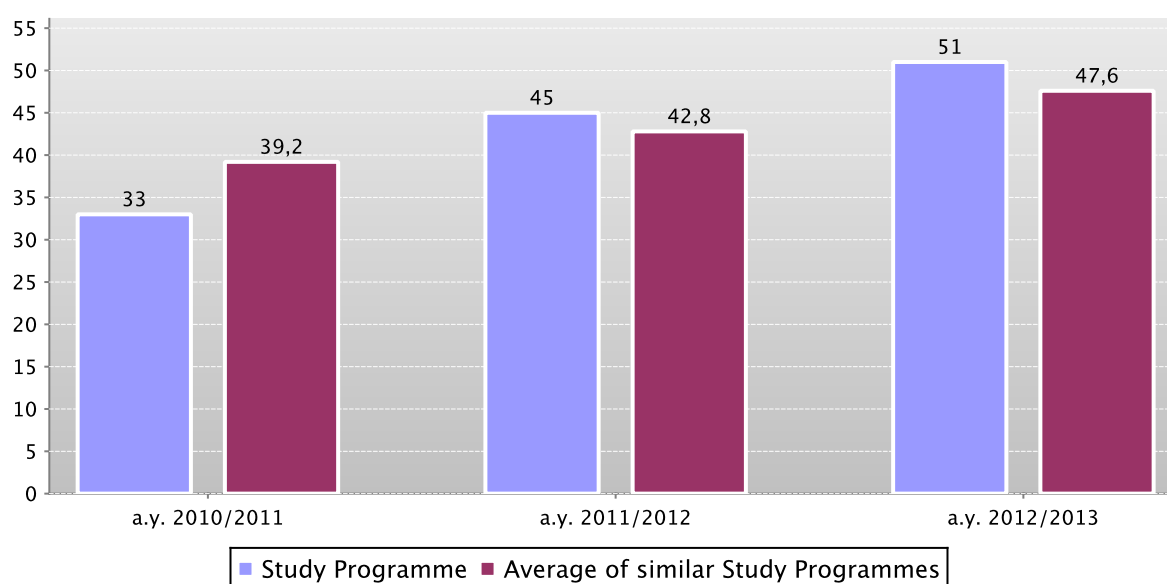
D.1. STUDENTS STARTING THEIR UNIVERSITY CAREERS

Characteristics of incoming students at the beginning of their study. Tables and graphs provide information on number of enrolled students (*new careers*), focusing on the characteristics of students and results of any entrance tests.

D.1.1. ENROLMENTS

The **graph** and the **table** show the number of **new careers** of the Study Programme compared with the **average of similar Study Programmes** (which belong to the same group), for the indicated academic years.

New careers



	a.y. 2010/2011		a.y. 2011/2012		a.y. 2012/2013	
	New careers	Total N. enrolled students	New careers	Total N. enrolled students	New careers	Total N. enrolled students
Study Programme	33	72	45	104	51	119
Average of similar Study Programmes	39,2	60,4	42,8	62,9	47,6	62,6

D.1.2. ADDITIONAL DATA ON STUDENTS' STARTING THEIR UNIVERSITY CAREERS

D.1.2.1. CANDIDATES REGISTERED FOR THE ENTRANCE EXAM

In academic year 2012/2013 access to this Study Programme was not restricted.

D.1.2.2. INCOMING STUDENTS

Geographic origin, type of 1st cycle degree, age and gender of students.

The data shows a homogeneous group of students (**cohort**) which started together their academic career.

Students which have **passed** to an other Study Programme, **transferred** from an other university, or registered to a 2nd degree are not included.

The **tables** show the number, geographic origin, gender, age, type and grade of 1st cycle degree of students enrolling in the degree programme.

The Study Programme data is compared with the average of similar Study Programmes (which belong to the same group), for the indicated academic years.

		New careers	Geographic origin					Gender		Average age of new career students		
			Students coming from the province of the Study Programme site	Students coming from other provinces where Unibo has a site	Students coming from other provinces of Emilia Romagna region	Students coming from other Italian regions	Students coming from abroad	M	F	22 or less	23 - 24	25 or more
Students 2010/2011	Study Programme	33	15,2%	9,1%	3,0%	72,7%		57,6%	42,4%	27,3%	51,5%	21,2%
	Average of similar Study Programmes	39,2	26,0%	19,0%	8,2%	42,6%	4,3%	70,2%	29,8%	36,7%	42,3%	21,0%
Students 2011/2012	Study Programme	45	22,2%	22,2%	6,7%	48,9%		51,1%	48,9%	15,6%	64,4%	20,0%
	Average of similar Study Programmes	42,8	25,6%	18,3%	8,1%	44,8%	3,2%	66,3%	33,7%	31,2%	46,7%	22,2%
Students 2012/2013	Study Programme	51	21,6%	23,5%	3,9%	49,0%	2,0%	47,1%	52,9%	27,5%	37,3%	35,3%
	Average of similar Study Programmes	47,6	27,9%	18,2%	6,2%	43,2%	4,6%	68,2%	31,8%	32,0%	44,7%	23,3%

		First Cycle Degree: University of previous studies				First Cycle Degree: more frequent class		First Cycle Degree: grade					
		University of Bologna	Other Italian Universities	Foreign University	Other not defined	Class code and name	% of students	First Cycle Degree grade between 66 and 90	First Cycle Degree grade between 91 and 100	First Cycle Degree grade between 101 and 105	First Cycle Degree grade between 106 and 110	First Cycle Degree grade 110 and honors	First Cycle Degree grade not available
Students 2010/2011	Study Programme	39,4%	60,6%			9 INGEGNERIA DELL'INFORMAZION	81,8%	18,2%	54,5%	9,1%	12,1%	6,1%	
	Average of similar Study Programmes	75,1%	17,9%	0,6%	6,4%	10 INGEGNERIA INDUSTRIALE	25,3%	16,3%	31,8%	16,8%	14,2%	14,5%	6,4%
Students 2011/2012	Study Programme	60,0%	40,0%			9 INGEGNERIA DELL'INFORMAZION	62,2%	31,1%	46,7%	11,1%	2,2%	8,9%	
	Average of similar Study Programmes	71,3%	21,4%	0,4%	6,9%	10 INGEGNERIA INDUSTRIALE	15,9%	15,3%	34,0%	17,7%	13,6%	12,5%	6,8%
Students 2012/2013	Study Programme	72,5%	27,5%			L-8 INGEGNERIA DELL'INFORMAZION	58,8%	27,5%	35,3%	7,8%	19,6%	9,8%	
	Average of similar Study Programmes	67,6%	15,8%	0,4%	16,3%	L-9 INGEGNERIA INDUSTRIALE	21,0%	16,4%	33,9%	12,8%	11,1%	9,5%	16,3%

D.2. REGULARITY OF STUDIES

Insight into the regularity with which the students pass their exams. The graphs and the tables provide information on the number of students who leave the programme between the first and second year and the number of regular graduates, focusing on the number of credits obtained at the end of the first year, on the exams passed and average grade achieved for each course unit.

D.2.1. STUDENTS LEAVING THE PROGRAMME BETWEEN YEARS 1 AND 2

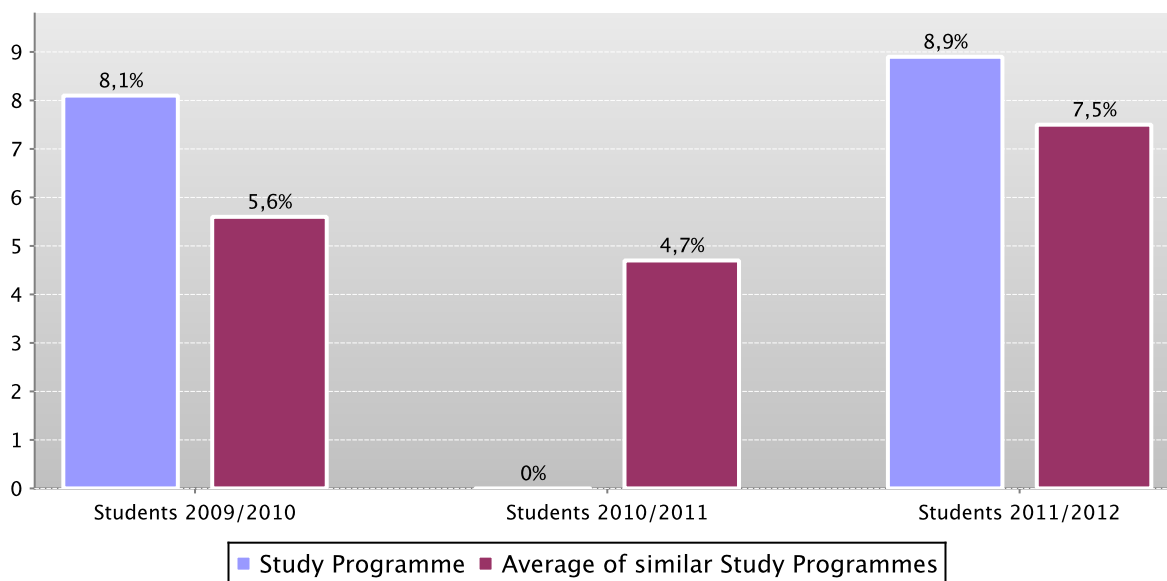
Here the number of students leaving the Study Programme is shown.

The **graph** shows the percentage of students who leave the programme after the first year compared to the **average of similar Study Programmes** (belonging to the same group).

The **table** shows the registered students (**new careers**), the percentage of students leaving the programme who **pass** to a different Study Programme in the same university, **transfer** to another university or **withdraw** from studies as well as the enrolled **repeating** students and those enrolled in the second year.

The Study Programme data is compared with the **average of similar Study Programmes** (which belong to the same group), for students registered (**new careers**) in the indicated academic years.

Percentage of withdrawals between years 1 and 2



		New careers	% withdrawals	% passages and transfers	% repeating students	Students enrolled in the second year
Students 2009/2010	Study Programme	37	8,1%	0,0%	0,0%	34
	Average of similar Study Programmes	40,5	5,6%	0,8%	0,1%	37,9
Students 2010/2011	Study Programme	33	0,0%	0,0%	0,0%	33
	Average of similar Study Programmes	39,2	4,7%	0,7%	0,0%	37,1
Students 2011/2012	Study Programme	45	8,9%	2,2%	0,0%	40
	Average of similar Study Programmes	42,8	7,5%	1,3%	0,1%	39

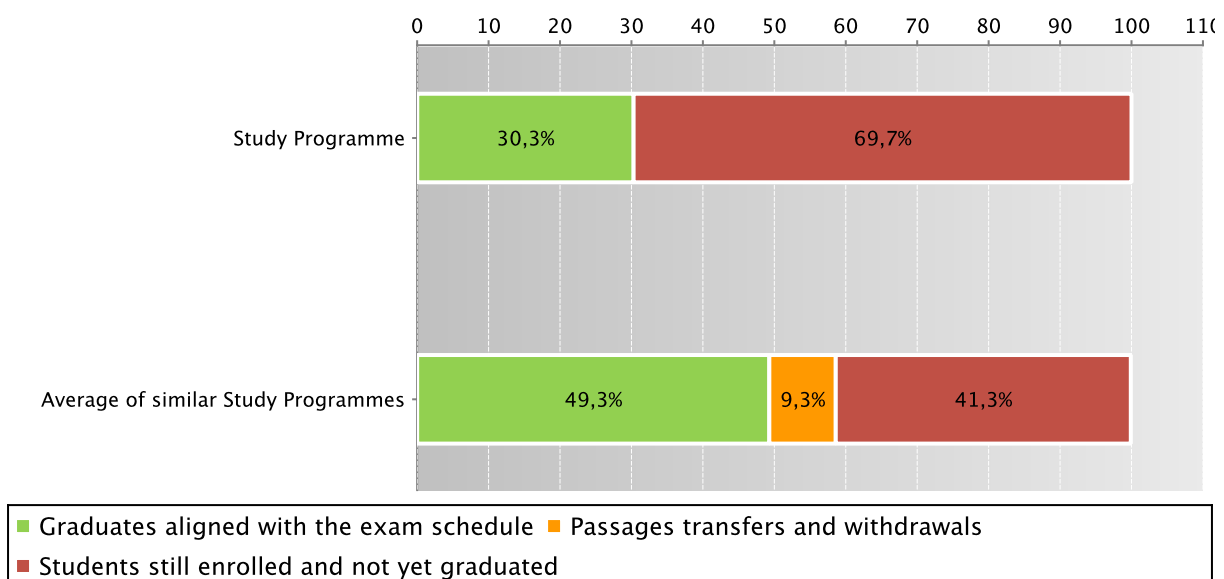
D.2.2. REGULAR GRADUATES

Here you will find information on regular graduates, on how many students, at the end of the regular programme duration, left the programme and how many are still enrolled but **not aligned to the exam schedule**.

The **graph** and the **table** show the situation concerning the **registered students (new careers)** for the indicated academic year, at the end of the regular duration of the Study Programme, highlighting the percentage of regular graduates, the number of students still enrolled (**not aligned to the exam schedule** and **repeating** students), students who have left the programme (including **passages, transfers** and **withdrawals**).

The Study Programme data is compared with the **average of similar Study Programmes** (which belong to the same group), for students enrolled in the indicated academic year.

Situation of students 2010/2011 at the end of regular duration of the study programme



		New careers		Regular graduates		Passages transfers and withdrawals		Students still enrolled and not yet graduated	
		N.	%	N.	%	N.	%	N.	%
Students 2009/2010	Study Programme	37	13	35,1%	3	8,1%	21	56,8%	
	Average of similar Study Programmes	40,5	17	42,0%	4,3	10,7%	19,1	47,2%	
Students 2010/2011	Study Programme	33	10	30,3%	0	0,0%	23	69,7%	
	Average of similar Study Programmes	39,2	19,3	49,3%	3,7	9,3%	16,2	41,3%	

See data of previous academic years – Study Programme D.M. 509/99 Biomedical Engineering (code 0235) [paragraph D.5.2.2.](#)

D.2.3. ADDITIONAL DATA ON REGULARITY OF STUDIES

D.2.3.1. CREDITS OBTAINED BY STUDENTS IN THE 1ST YEAR

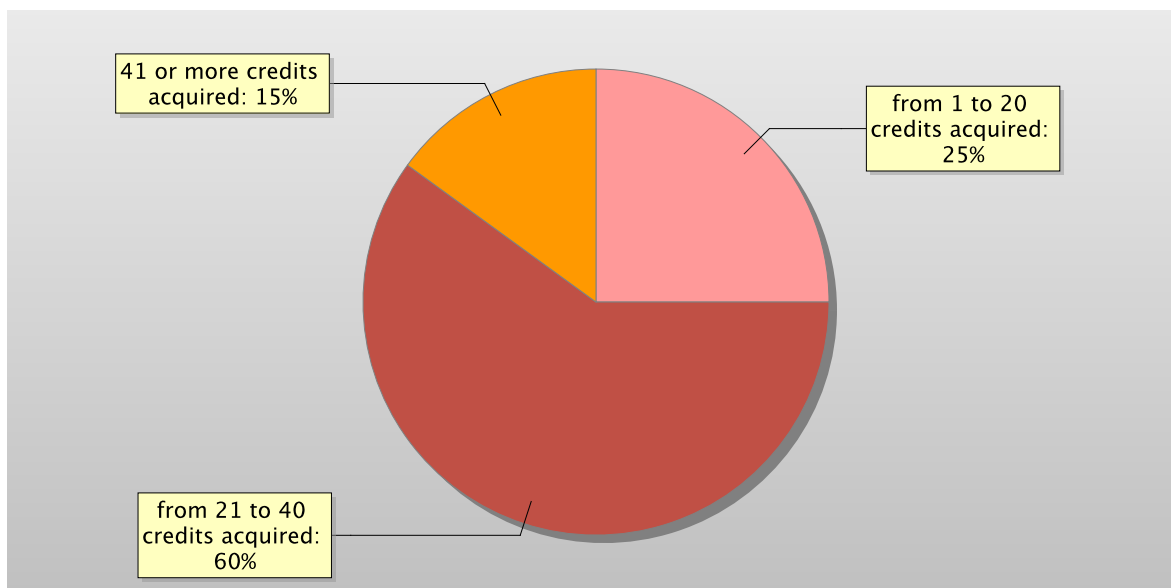
This offers an insight into how regularly students pass their exams.

The **graph** shows the distribution of the students according to the number of **credits** obtained at the end of the first year.

In addition, the **table** shows the number of students registered at the second year and average **credits** obtained during the first year.

The Study Programme data is compared with the **average of similar Study Programmes** (wich belong to the same group), for students registered in the indicated academic years.

Distribution of the students in 2011/2012 according to the number of credits obtained at the end of the first year*



		Students enrolled in the 2nd year	% students with *				Average credits per student
			0 credits acquired	from 1 to 20 credits acquired	from 21 to 40 credits acquired	41 or more credits acquired	
Students 2009/2010	Study Programme	34	5,9%	20,6%	41,2%	32,4%	31,4
	Average of similar Study Programmes	37,9	8,1%	22,8%	42,5%	26,7%	29
Students 2010/2011	Study Programme	33	3,0%	30,3%	54,5%	12,1%	24,5
	Average of similar Study Programmes	37,1	6,8%	17,0%	45,8%	30,4%	31,2
Students 2011/2012	Study Programme	40		25,0%	60,0%	15,0%	28,9
	Average of similar Study Programmes	39	3,1%	16,3%	45,0%	35,6%	33,9

*Note: by convention, credits are considered to be obtained by students by 31st October of the year following the year of enrolment.

D.2.3.2. EXAMS PASSED AND AVERAGE GRADE

The **table** shows number of exams passed and average grade achieved for each course unit in the calendar year 2011. Marks for the exams passed are expressed out of thirty.

The data refers to the course unit code and therefore includes the various branches of the programme divided into channels or sub-groups, divided by letter.

It considers all subjects for which a grade is assigned, and therefore excludes all those to which a pass/fail score is allocated.

The data concerning previous programmes is given in a separate section.

Data of the Study Programme D.M. 270/04 Ingegneria biomedica (code 8198)

	N. of exams passed	Average grade *
34777 SISTEMI DI ELABORAZIONE DELL'INFORMAZIONE LM	2	
34781 INTELLIGENZA ARTIFICIALE LM	3	
34793 ANALISI NUMERICA E ALGEBRA LM (C.I.)	16	26,8
34797 BIOCHIMICA LM	20	26,7
34799 MODELLI DI SISTEMI BIOLOGICI LM	38	24,4
34801 BIOELETTRROMAGNETISMO LM	38	25,8
34803 BIOMECCANICA LM	38	26,2
34805 STRUMENTAZIONE BIOMEDICA E ORGANI ARTIFICIALI LM (C.I.)	15	26
34809 ELABORAZIONE DI DATI E SEGNALI BIOMEDICI LM	32	25,8
34810 BIOIMMAGINI E VISIONE LM	28	27,8
34811 BIOINGEGNERIA DELLA RIABILITAZIONE LM	19	25,8

	N. of exams passed	Average grade *
34812 BIOINGEGNERIA MOLECOLARE E CELLULARE LM	25	27,5
34813 MECCANICA DEI TESSUTI BIOLOGICI LM	21	28
34814 SISTEMI NEURALI LM	27	25,6
34825 FENOMENI DI TRASPORTO LM	2	
34826 BIOMECCANICA COMPUTAZIONALE LM	2	
35205 SENSORI E NANOELETRONICA LM (C.I.)	9	25,1
65590 STRUMENTAZIONE BIOMEDICA E ORGANI ARTIFICIALI LM	26	26,1
65592 ANALISI NUMERICA E ALGEBRA LM	19	27,3

* Note: no average grade is given if the number of exams passed is less than or equal to 5.

D.3. OPINIONS OF GRADUATES AND ATTENDING STUDENTS

Opinions of graduates on the Study Programme.

Tables and graphs provide information on the number of graduates who expressed positive opinions on the Study Programme, focusing on opinions expressed by attending students on course units.

D.3.1. OPINION OF GRADUATES

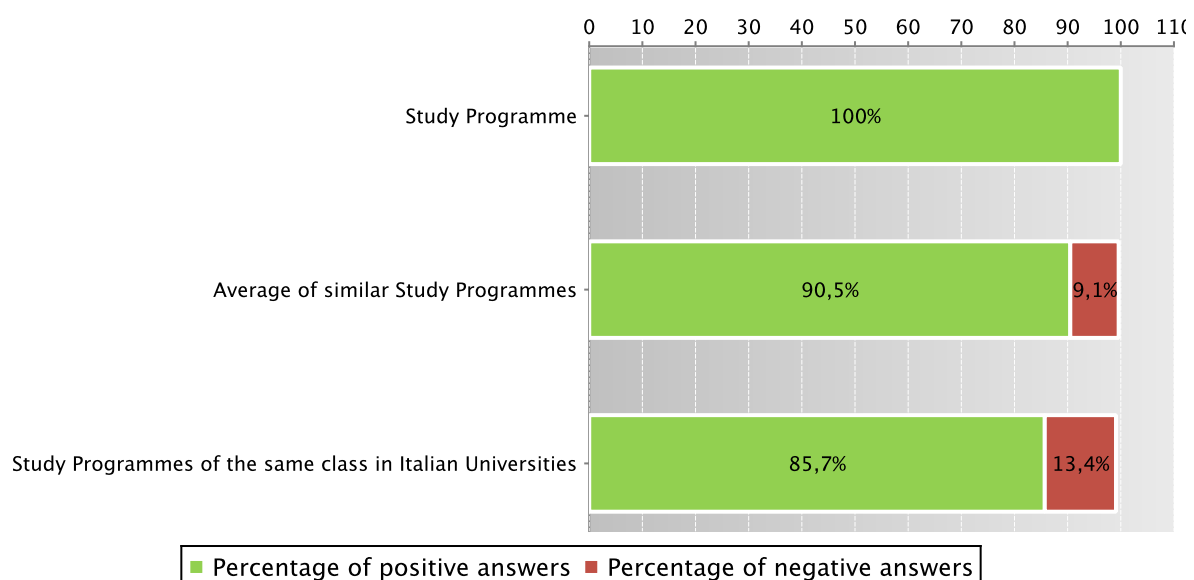
The **graph** shows the percentage of graduates (*AlmaLaurea* survey) who responded positively to the question: “**Are you generally satisfied with the Study Programme**”.

In addition, the **table** shows the percentage of students who answered “Yes, to the same programme at the university” to the question “Would you register again to the university?”.

The Study Programme data is compared with the **average of similar Study Programmes (which belong to the same group)**, and the average of Study Programmes of the same **class** of other Italian universities for the graduates of the indicated years.

Graduates in 2012 who responded positively to the question: “Are you generally satisfied with this Study Programme?”

Data of the Study Programme D.M. 270/04 Ingegneria biomedica (code 8198)



Data of the Study Programme D.M. 270/04 Ingegneria biomedica (code 8198)

		N. graduates	Completed Questionnaires	% of positive answers to the question: "Are you generally satisfied with this Study Programme?"	% of answers "yes to the same Programme in the same University" to the question "Would you register again to the University?"
2011	Study Programme	4	4		
	Average of similar Study Programmes	20	19,4	90,0%	78,4%
	Study Programmes of the same class in Italian Universities	120	118	96,6%	76,3%
2012	Study Programme	25	25	100,0%	80,0%
	Average of similar Study Programmes	22	21,5	90,5%	78,6%
	Study Programmes of the same class in Italian Universities	339	329	85,7%	69,6%

Symbols:

(*) The opinions of the Study Programmes with less than 5 graduates are not shown.

Further information on [Graduates' Profile Report](#).

See data of previous academic years – Study Programme D.M. 509/99 Biomedical Engineering (code 0235) [paragraph D.5.3.1](#).

D.3.2 ADDITIONAL DATA ON OPINIONS OF STUDENTS

D.3.2.1. OPINION OF ATTENDING STUDENTS

The **graph** shows the percentage of attending students who responded positively to the question in the questionnaire: “Are you generally satisfied with this course unit?” in academic year 2011/2012.

The **table** also shows the number of completed questionnaires.

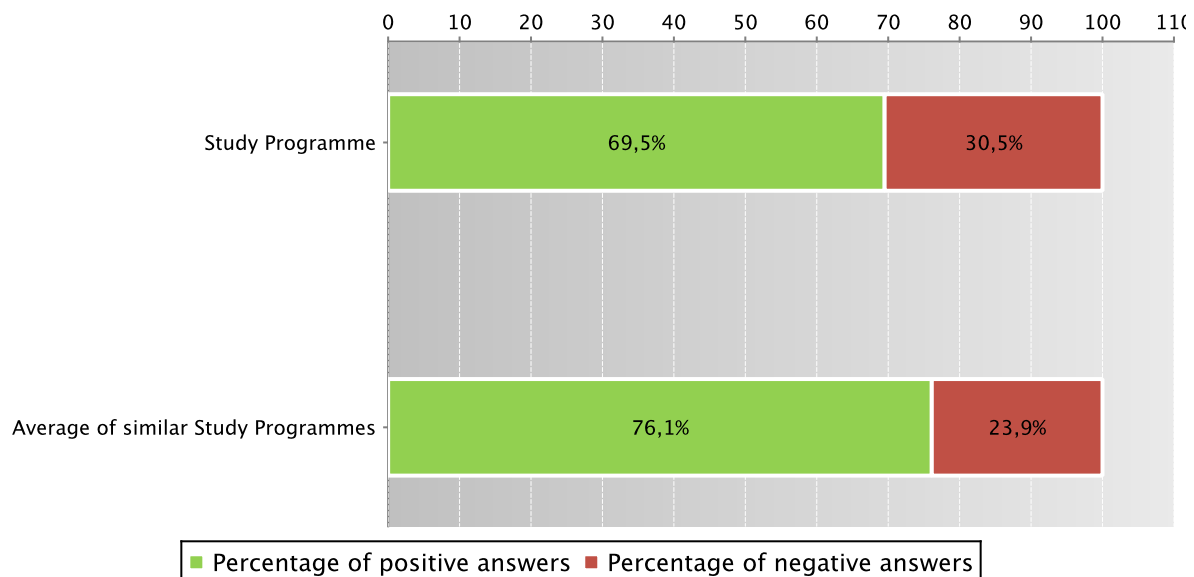
The Study Programme data is compared with the **average of similar Study Programmes** (which belong to the same group), for the indicated academic years.

The data concerning the students' opinion refers to the opinions of those attending lessons, whether they are enrolled in the current programme or a Study Programme running under pre-reform regulations (under D.M. 509).

For the University of Bologna the survey and subsequently analysis of the opinions of students attending the course is cared by *Aform* - Quality Assurance Department and *Arag* - Support Planning and Evaluation Department. The overall results and the methods of collection and analysis are described in the document published online on the [Statistical Observatory of the University of Bologna](#) (see the note in the glossary).

Students who responded positively to the question: “Are you generally satisfied with this course unit?” in academic year 2011/2012

Data of the Study Programme D.M. 270/04 Ingegneria biomedica (code 8198) and of the Study Programme D.M. 509/99 Ingegneria biomedica (code 0235)



Data of the Study Programme D.M. 270/04 Ingegneria biomedica (code 8198) and of the Study Programme D.M. 509/99 Ingegneria biomedica (code 0235)

		Number of completed questionnaires	% of positive answers concerning the general satisfaction with the course unit – Question 19
a.y. 2009/2010	Study Programme	466	72,5%
	Average of similar Study Programmes	386,1	77,1%
a.y. 2010/2011	Study Programme	432	72,7%
	Average of similar Study Programmes	372,6	77,9%
a.y. 2011/2012	Study Programme	427	69,5%
	Average of similar Study Programmes	422,1	76,1%

Symbols:

(*) When there is a small number of questionnaires, the percentage of positive opinions on overall satisfaction is not presented. Further information on [Rapporto Opinione degli studenti frequentanti sulle attività didattiche](#) (the content is in Italian).

D.4. ENTRY INTO THE WORLD OF WORK

Employment situation of graduates of the Study Programme.

Tables and graphs provide information on the employment situation of graduates one year after graduating.

D.4.1. EMPLOYMENT SITUATION

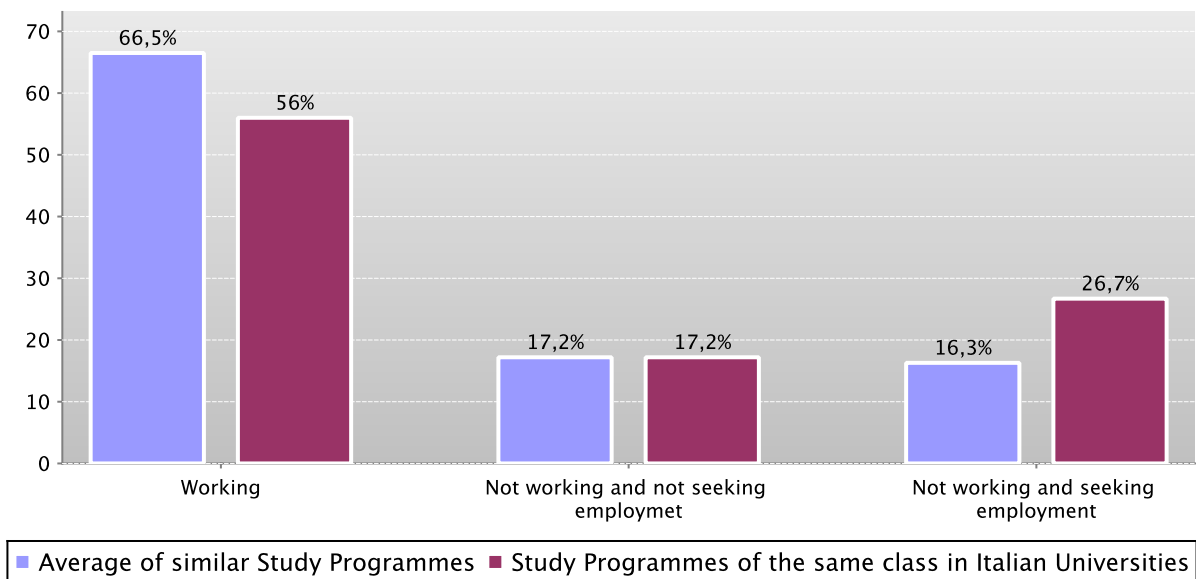
The paragraph shows the employment situation of graduates one year after graduating.

The data is taken from the [AlmaLaurea](#) reports on the employment situation of graduates.

The **graph** shows who is working, who is not working and is not seeking employment, who is not working but is seeking employment. In addition, the **table** shows the number of graduates interviewed, the number involved in internships and traineeships and the appropriateness of their degree to the job.

The Study Programme data is compared with the [average of similar Study Programmes \(which belong to the same group\)](#) and the average of Study Programmes of the same [class](#) of other Italian universities for the graduates of the indicated years.

Employment situation of graduates in 2011 one year after graduating



		N. graduates interviewed	Employment situation (1)			Degree's appropriateness for the job (referred to the graduates who just work) (3)		
			Working	Not working and not seeking employment	Not working and seeking employment	Not working, not seeking employment, but following a university programme/traineeship (2)	Effective / very effective	Quite effective
Graduation Year 2011	Study Programme	4						
	Average of similar Study Programmes	17,8	66,5%	17,2%	16,3%	12,3%	58,1%	30,8%
	Study Programmes of the same class in Italian Universities	116	56,0%	17,2%	26,7%	14,7%	44,4%	34,9%

Symbols:

(*) The opinions of the Study Programmes with less than 5 graduates are not shown.

Notes on the AlmaLaurea report on the employment situation of graduates

(1) "Employment situation": the definition includes the number of employed graduates who declaring to carry out a paid work activity, provided that is not training activity (internship, traineeship, PhD degrees, specialization schools).

(2) "Number of those who do not work, who are not seeking employment but who are following a university programme/traineeship": the definition includes those who are enrolled in traineeships, PhD degrees, specialisation schools, Italian "master universitari" (first and second level). The presentation of this data complies with article 2 of D.M. 544 of 31st October 2007, as later provided for in Management Decree no. 61 of 10th June 2008 (transparency requirements).

(3) The evaluation of the appropriateness of the degree is obtained by a combination of the requirement of the relative qualification for the job held and the level of usage of the skills learned at university.

Further information on [Graduates' Employment report](#).

See data of previous academic years – Study Programme D.M. 509/99 Biomedical Engineering (code 0235) [paragraph D.5.4.1](#).

D.5. INFORMATION ON PRE-REFORM PROGRAMMES (DM 509/99)

D.5.1. STUDENTS STARTING THEIR UNIVERSITY CAREERS

Characteristics of incoming students at the beginning of their study. Tables and graphs provide information on number of enrolled students (new careers), focusing on the characteristics of students.

D.5.1.1. ENROLMENTS

Data of enrolments of the last three academic years are shown in paragraph [D.1.1](#).

D.5.1.2. ADDITIONAL DATA ON STUDENTS' STARTING THEIR UNIVERSITY CAREERS

D.5.1.2.1. CANDIDATES REGISTERED FOR THE ENTRANCE EXAM

Data of candidates registered for the entrance exam are shown in paragraph [D.1.2.1](#).

D.5.1.2.2. INCOMING STUDENTS

Data of incoming students of the last three academic years are shown in paragraph [D.1.2.2](#).

D.5.2. REGULARITY OF STUDIES

Insight into the regularity with which the students pass their exams.

Graphs and tables provide information on the number of students who leave the programme after the first year and the number of regular graduates, focusing on the number of credits obtained at the end of the first year, number of exams passed and the average grade achieved for each course unit.

D.5.2.1. STUDENTS LEAVING THE PROGRAMME BETWEEN YEARS 1 AND 2

Data of students leaving the Study Programme of the last three academic years are shown in paragraph D.2.1.

D.5.2.2. REGULAR GRADUATES

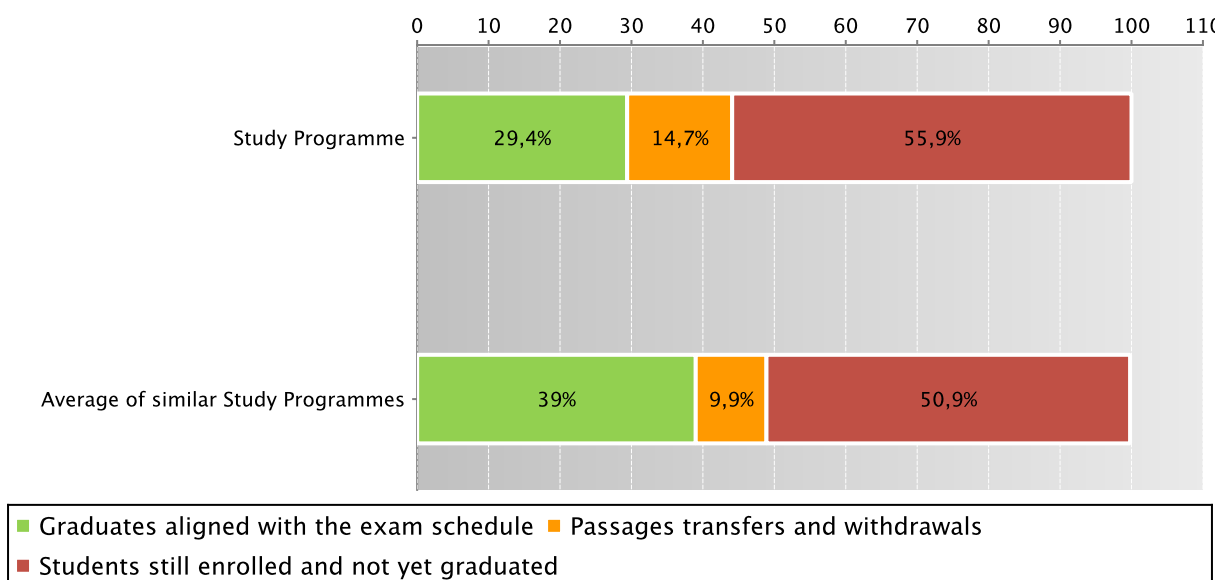
Here you will find information on regular graduates, on how many students, at the end of the regular programme duration, left the programme and how many are still enrolled but not aligned to the exam schedule.

The **graph** and the **table** show the situation concerning the students enrolled at the first year (**new careers**) for the indicated academic year, at the end of the regular duration of the Study Programme, highlighting the percentage of regular graduates, the number of students still enrolled (**not aligned to the exam schedule** and **repeating** students), students who have left the programme (including **passages, transfers** and **withdrawals**).

The Study Programme data is compared with the **average of similar Study Programmes** (which belong to the same group), for students registered in the indicated academic years.

Situation of students 2008/2009 at the end of regular duration of the study programme

Data of the Study Programme D.M. 509/99 Biomedical Engineering (code 0235)



Data of the Study Programme D.M. 509/99 Biomedical Engineering (code 0235)

		New careers		Regular graduates		Passages transfers and withdrawals		Students still enrolled and not yet graduated	
		N.	%	N.	%	N.	%	N.	%
Students 2008/2009	Study Programme	34	10	29,4%	5	14,7%	19	55,9%	
	Average of similar Study Programmes	42,6	16,6	39,0%	4,2	9,9%	21,7	50,9%	

Go back to [D.2.2. Regular graduates](#)

D.5.2.3. ADDITIONAL DATA ON REGULARITY OF STUDIES

D.5.2.3.1. CREDITS OBTAINED BY STUDENTS IN THE 1ST YEAR

Data of credits obtained by students in the 1st year of the last three academic years are shown in paragraph D.2.3.1.

D.5.2.3.2. EXAMS PASSED AND AVERAGE GRADE

Data of exams passed and average grade are shown in paragraph D.2.3.2.

D.5.3. OPINIONS OF ATTENDING STUDENTS AND GRADUATES

Opinions of graduates on the Study Programme.

Tables and graphs provide information on the number of graduates who expressed positive opinions on the Study Programme, focusing on opinions expressed by attending students on course units.

D.5.3.1. OPINION OF GRADUATES

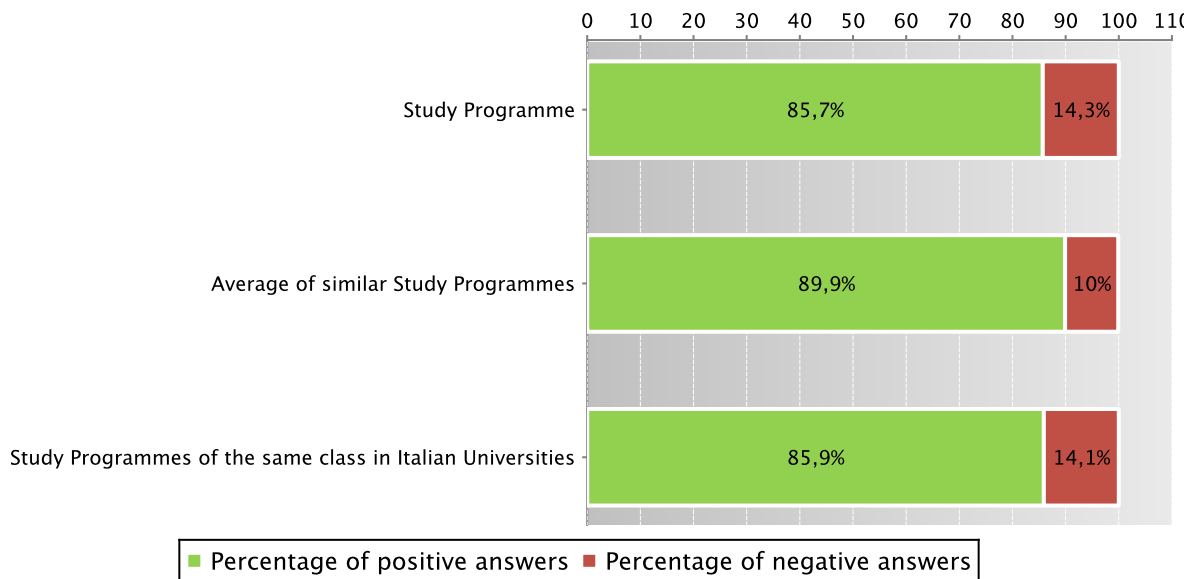
The **graph** shows the percentage of graduates (AlmaLaurea survey) who responded positively to the question: “**Are you generally satisfied with the Study Programme?**”.

In addition, the **table** shows the percentage of students who answered “Yes, to the same programme at the university” to the question “Would you register again to the university?”.

The Study Programme data is compared with the **average of similar Study Programmes (which belong to the same group)**, for the indicated years.

Graduates in 2010 who responded positively to the question: “Are you generally satisfied with this Study Programme?”

Data of the Study Programme D.M. 509/99 Ingegneria biomedica (code 0235)



Data of the Study Programme D.M. 509/99 Ingegneria biomedica (code 0235)

		N. graduates	Completed Questionnaires	% of positive answers to the question: “Are you generally satisfied with this Study Programme?”	% of answers “yes to the same Programme in the same University” to the question “Would you register again to the University?”
2010	Study Programme	28	28	85,7%	71,4%
	Average of similar Study Programmes	25,5	24,8	89,9%	78,6%
	Study Programmes of the same class in Italian Universities	354	341	85,9%	75,4%

Symbols:

(*) The opinions of the Study Programmes with less than 5 graduates are not shown.

Further information on [Graduates’ Profile Report](#).

Go back to [D.3.1. Opinion of graduates](#)

D.5.3.2 ADDITIONAL DATA ON OPINIONS OF STUDENTS

D.5.3.2.1. OPINION OF ATTENDING STUDENTS

Data of opinion of attending students of the last three academic years are shown in paragraph D.3.2.1.

D.5.4. ENTRY INTO THE WORLD OF WORK

Employment situation of graduates of the Study Programme.

Tables and graphs provide information on the employment situation of graduates one year after graduating.

D.5.4.1. EMPLOYMENT SITUATION

The paragraph shows the employment situation of graduates one year after graduating.

The data is taken from the [AlmaLaurea](#) reports on the employment situation of graduates.

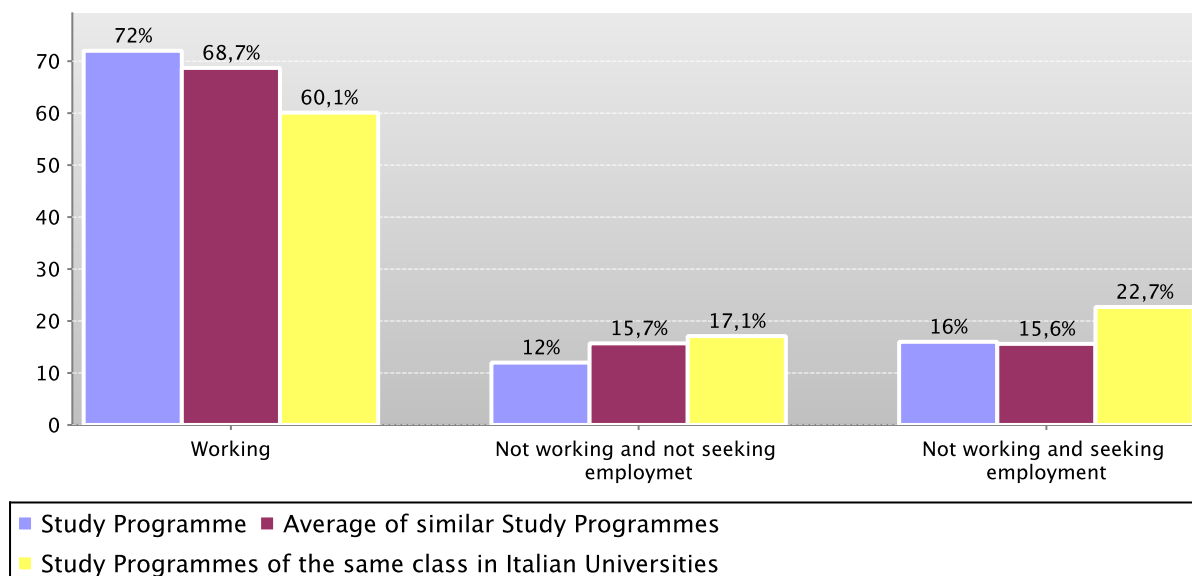
The **graph** shows who is working, who is not working and is not seeking employment, who is not working but is seeking employment.

In addition, the **table** shows the number of graduates interviewed, the number involved in internships and traineeships and the appropriateness of their degree to the job.

The Study Programme data is compared with the [average of similar Study Programmes \(which belong to the same group\)](#) and the average of Study Programmes of the same [class](#) of other Italian universities for the graduates of the indicated years.

Employment situation of graduates in 2010 one year after graduating

Data of the Study Programme D.M. 509/99 Biomedical Engineering (code 0235)



Data of the Study Programme D.M. 509/99 Biomedical Engineering (code 0235)

	N. graduates interviewed	Employment situation (1)			Not working, not seeking employment, but following a university programme/traineeship (2)	Degree's appropriateness for the job (referred to the graduates who just work) (3)		
		Working	Not working and not seeking employment	Not working and seeking employment		Effective / very effective	Quite effective	
Graduation Year 2009	Study Programme	36	63,9%	16,7%	19,4%	8,3%	56,5%	34,8%
	Average of similar Study Programmes	32,1	63,8%	18,3%	17,9%	11,8%	55,3%	34,7%
	Study Programmes of the same class in Italian Universities	296	54,4%	22,6%	23,0%	14,9%	46,5%	37,1%
Graduation Year 2010	Study Programme	25	72,0%	12,0%	16,0%	4,0%	55,6%	38,9%
	Average of similar Study Programmes	23,5	68,7%	15,7%	15,6%	9,9%	57,4%	32,5%
	Study Programmes of the same class in Italian Universities	321	60,1%	17,1%	22,7%	12,5%	44,6%	41,4%

Symbols:

(*) The opinions of the Study Programmes with less than 5 graduates are not shown.

Notes on the AlmaLaurea report on the employment situation of graduates

(1) "Employment situation": the definition includes the number of employed graduates who declaring to carry out a paid work activity, provided that is not training activity (internship, traineeship, PhD degrees, specialization schools).

(2) "Number of those who do not work, who are not seeking employment but who are following a university programme/traineeship": the definition includes those who are enrolled in traineeships, PhD degrees, specialisation schools, Italian "master universitari" (first and second level). The presentation of this data complies with article 2 of D.M. 544 of 31st October 2007, as later provided for in Management Decree no. 61 of 10th June 2008 (transparency requirements).

(3) The evaluation of the appropriateness of the degree is obtained by a combination of the requirement of the relative qualification for the job held and the level of usage of the skills learned at university.

Further information on [Graduates' Employment report](#).

Go back to [D.4.1. Employment situation](#)

E. FIND OUT MORE: THE QUALITY OF YOUR STUDY PROGRAMME

The University of Bologna has identified its objectives as the *personal, cultural and professional growth of students and the improvement of the quality of learning, also in relation to the needs of society* (Strategic Plan 2010-2013).

Students, employers and society as a whole, have the right to effective learning for individual and intellectual growth, to develop critical sense and to prepare for the world of work.

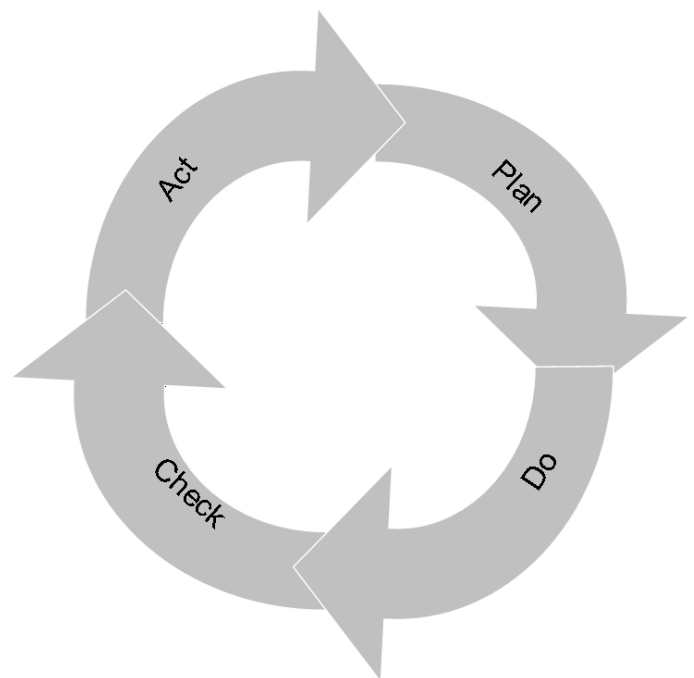
In the Statute and the Strategic Plan 2010-2013 the University of Bologna acknowledges its responsibility in guaranteeing the quality of its study programmes, and for this purpose adopts an "internal quality assurance system".

The Internal Quality Assurance system

The internal quality assurance system is a set of processes and responsibilities adopted to guarantee the quality of Study Programmes at the University of Bologna.

The guarantee of the quality of a Study Programme is the correspondence of the results achieved with the set objectives, in the following phases:

- Plan: defining the objectives
- Do: implementing the planned actions
- Check: checking that the objectives have been achieved
- Act: planning improvement action



This path responds to the expectations of students, guides teaching behaviour and provides indicators for the assessment of results. Self-assessment is based on the analysis of significant data (for example, the number of students graduating in line with the exam schedule, students' opinions and the employment rates of graduates) and highlights strengths and weaknesses in order to reflect on the achieved results, critically consider one's own working methods and take steps for the continual improvement of the Programme. This path involves all educational stakeholders, including students, in order to make use of the contributions of everyone with first-hand knowledge of the Study Programme. Improvement is therefore a day to day development, concerning all aspects of teaching: from the lesson timetable to the publication of on-line programmes, from classroom management to exam methods, and the actual design of the Programme.

This is what happens in each phase:

- **Planning:** the Study Programme is the result of a proposal from the teaching structures and approved by the Academic Bodies.
- **Management:** Schools, Departments and Study Programmes manage the activities required to ensure teaching. The activities are organised as follows:

What we do	Who does what				
	Professors	Study Programme	Schools	Departments	General Administration
Teaching calendar, lessons programme and exam schedules			x		
Management of financial resources			x	x	
Classroom teaching	x				
Management of classrooms and laboratories			x	x	
Libraries and study rooms			x	x	
Approval of individual study plans		x			
Communication and information		x	x		Academic Affairs Division
Guidance service		x	x		Academic Affairs Division
Internships		x	x		Academic Affairs Division
Administrative services: Student Administration Office					Academic Affairs Division
Administration services: Degree programme office			x		Academic Affairs Division
Study grants and loans ad honorem					Academic Affairs Division
Student mobility: university subsidies and programmes					International Relations Division
Mobility: study grants for dissertations abroad			x		
Mobility: authorisations and recognitions		x			
Other students support services		x	x		x

- Internal assessment:** every Study Programme periodically assesses its own results, evaluating, for example, the number of enrolled students, the number of withdrawing students, student opinions etc.; in this way, the strengths and weaknesses, as well as any implemented improvement actions, are highlighted. This phase is organised as follows:

What we do	Who does what
<p>Definition, gathering and publication of evaluation data According to the general guidelines of the University and national and international standards, are defined the tools through which should be evaluated the results (indicators). The survey data to be evaluate are published every year on the Report of the Study Program.</p>	Academic Bodies
<p>Self-Assessment The Schools and Study Programmes assess the effectiveness of the previously adopted solutions, analyse the progress of their learning activities and draw up proposals for improvement.</p>	Schools and Study Programmes
<p>Internal audit</p> <p>The results of the self-assessment process are reviewed in the following phases:</p> <ul style="list-style-type: none"> • Analysis: the University Quality Manager analyses the review documents, considering the ability to identify problems, propose solutions and the overall development of the internal quality assurance system. • Review: The observations on the results obtained and the good practices adopted are examined together with the persons in charge of the Schools and Study Programmes in meetings organised by scientific-disciplinary field. The persons in charge receive the observations and inputs on the areas for development and the actions to be adopted in future to improve results. • Sharing: the conclusions of the review activities are submitted to the Academic Bodies and the University Evaluation Board. 	<p>Quality Manager</p> <p>Vice Rector for Teaching and Education</p> <p>Academic Bodies</p>
<ul style="list-style-type: none"> • Improvement: on the basis of the results of the internal audit, the Schools and Study Programmes plan improvement activities, to ensure that the Study Programmes increasingly respond to the needs of society. The cycle then starts over again, with the definition of actions to be implemented, the results of which are in turn verified, in a continuous path that guarantees the quality of education. 	

F. GLOSSARY TERMS

Additional Learning Requirements

Students enrolling in the first year of a first cycle or single cycle degree and who, following the results of the entrance exams established for each study programme, do not possess the knowledge required for access to the programme, are assigned additional learning requirements (OFA).

The OFA are fulfilled by passing an assessment test defined by the programme.

The non-fulfilment of the requirements by the date set by the Academic Bodies and published on the University Portal will lead to the re-enrolment in the first year of the programme.

AlmaLaurea

AlmaLaurea is an innovative in-line database service of graduates' curriculum vitae (1,620,000 CVs, from 53 Italian universities as of 05/07/2012), which offers a link between graduates, universities and businesses.

Created in 1994 on the initiative of the Statistical Observatory of the University of Bologna, managed by a consortium of Italian universities with the support of the Ministry of Education, University and Research, the purpose AlmaLaurea is to act as a point of contact between businesses and graduates, a reference within universities for anyone (students, businesses, etc...) working in the field of university studies, employment and the condition of young people at different levels.

Average of similar study programmes (belonging to the same group)

Average of the Study Programmes (which belong to the subject group)

Calculated average which refers to all study programmes of the same cycle which belong to the subject group.

There are four groups, composed as follows:

- **BIOMEDICAL** group: Study Programmes of the Schools of Pharmacy, Biotechnology and Sport Science; Medicine; Agriculture and Veterinary Medicine
- **SCIENTIFIC-TECHNOLOGICAL** group: Study Programmes of the Schools of Engineering and Architecture; Sciences
- **SOCIAL SCIENCES** group: Study Programmes of the Schools of Economics, Management, and Statistics; Law, Political Sciences
- **HUMANITIES** group: Study Programmes of the Schools of Arts, Humanities, and Cultural Heritage; Foreign Languages and Literatures, Interpreting and Translation; Psychology and Education

CFU University Learning Credits

University Learning Credits (CFU) were introduced under Italian Ministerial Decree no. 509/99 to comply with European legislation, and are a measurement of the volume of learning, including individual study, required of students; generally 1 CFU corresponds to 25 hours of a student's "overall learning effort".

Class

Degree classes group together study programmes of the same level and with the same key learning outcomes and available learning activities for a given number of credits and in sectors which are identified as indispensable. The features of the classes are set nationally, by Ministerial Decree, and are therefore common to all universities.

Cohort

Cohort refers to a group of students enrolled in the same academic year.

Enrolment status

In terms of enrolment, students may be:

- **Regularly enrolled:** students enrolled for as many or fewer years than the legal duration of the study programme, who do not fall into any of the following categories;
- **Not aligned with the exam schedule:** students who, without having graduated, have enrolled in all the years of the study programme and which, for programmes with compulsory attendance, have obtained all attendance certificates;
- **Repeating:** students re-enrolling in the same year of a programme again. Starting from academic year 2009-2010, students who have not fulfilled the assigned additional learning requirements within the deadline have to enrol in the 1st year as repeating students.

Entrance exam

Enrolment in a study programme may be free access or restricted access.

For all programmes with restricted access, candidates are required to sit an entrance exam and there are a limited number of places available. The entrance exam is a test which is used to draw up a graded list of candidates; students may enrol in the programme according to their place in the list. The methods of managing the call for applications and the list of candidates, including the methods for filling any unclaimed places, may vary from year to year. The test may be specific to a Degree Programme or may be part of a single exam covering several programmes from the same university or from other universities (during the registration the students should indicate their first choice).

The following definitions apply:

Available places = the number of places laid down in the call for applications to the Study Programme, or determined by subsequent legal provisions; these exclude any additional places reserved according to special provisions of the programme (e.g. for international study programmes, they do not include places for foreign students selected from other universities; for all programmes with restricted access regulated nationally, these do not include the places reserved for transferring students).

Number of candidates for the exam = number of students registered for the exam indicating the study programme as their first choice;

Number of participants in the exam = number of students participating in the exam indicating the study programme as their first choice;

Number of participants in the exam for every available place = number of students participating in the exam who indicated the study programme as their first choice as a ratio of the number of places available on the programme.

First year enrolments

This includes all students enrolled in the first year, including those joining the study programme in its first year through transferrals, as well as those enrolled in the first year but not for the first time (e.g. repeating students).

New Careers

Students who start a new university career (excluding transfers) from year one in a second cycle programme.

Passages and transfers

Passage: when a student applies to move to a different study programme from the one enrolled in the previous year, within the same university.

Transfer: when a student transfers from a study programme in one university to any programme in another university.

Registered students

Students who begin a career in the Italian University System for the first time and who enrol in the first year (i.e. for whom no previous university careers are recorded) of a First Cycle (L509, L) or Single Cycle programme (LSCU, LMCU)

Statistical Observatory of the University of Bologna

The Statistical Observatory was founded in 1997 in order to “provide the university governing bodies with a reliable and timely documentary and monitoring database aiming to promote decision-making processes and planning, particularly of learning activities and other services targeting the student population” (art.1 of the Founding and Operational Regulation). Following the disabling of the Statistical Observatory, as resolved by the Board of Governors on 14 December 2010, from the second semester of academic year 2010-11 the survey and subsequently analysis of the attending students opinion is cared for the University of Bologna by Academic Affairs Division - Quality Assurance Department and Control and Finance Division - Support Planning and Evaluation Department. The overall results and the methods of collection and analysis are described in the document published online on the [Statistical Observatory of the University of Bologna](#).

University DataWarehouse

In information service for the managers of the University of Bologna organisational departments which gathers, integrates and reorganises data from various sources and makes it available for analysis and evaluation for the purposes of planning and decision-making.

Withdrawal

Suspension of studies by students who do not register in the next academic year, or who drop out from the degree programme.