2013

REPORT

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

School of Engineering and Architecture – Forlì Campus

Laurea Magistrale (Second cycle degree/Two year Master - 120 ECTS) in Aerospace Engineering A.Y. 2013/2014

Programme Director Prof. Paolo Tortora

INDICE

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.

This information is not available in English at this time.

A.2. ADMISSION REQUIREMENTS

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

This information is not available in English at this time.

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: Area 1: FURTHERING BASIC KNOWLEDGE
2nd cycle Graduates
- have in-depth knowledge of the theoretical and scientific aspects of mathematics, physics and other general sciences;
- understand the fundamental principles and techniques of numerical and mathematical modelling applied to engineering subjects, particularly in the aerospace field.
Knowledge is acquired in lectures and exercises in the classroom, in the fields of Mathematical Analysis and Numerical Analysis and Methods.
It is assessed in written and oral exams based on the evaluation of the results achieved in the course units.

Area 2: AEROSPACE AND GENERAL ASTRONAUTICAL ENGINEERING
2nd cycle Graduates
- have advanced knowledge of aerospace construction, plants and systems, aerodynamics, flight dynamics, propulsion, aeronautical and astronautical technologies and controls
- are familiar with business organisation and professional ethics.
Knowledge is acquired through lectures, exercises in the classroom, practical workshops and the production of autonomous projects in the fields of Flight Mechanics Dynamics, Structures and Materials, Systems, Aerodynamics, Propulsion, Design and Control Methods.
The learning outcomes will be assessed mainly through written and oral exams, tests and oral and multimedia presentations.

Area 3: AERONAUTICAL ENGINEERING
2nd cycle Graduates
- have in-depth analytical skills applied to structures, including the typical technological processes of aerospace production, also using composite materials
- have in-depth knowledge of the experimental methods of aerodynamics and simulation methods and modelling in fluid mechanics, including the mathematical and numerical analysis of high and low speed flows, particularly studying the fundamental physical aspects (turbulence).
Knowledge is acquired through lectures, exercises in the classroom and the production of autonomous projects in the field of aircraft studies.
The learning outcomes will be assessed mainly through written and oral exams, tests and oral and multimedia presentations.

Area 4: ASTRONAUTICAL AND SPACE ENGINEERING
2nd cycle Graduates
- have in-depth knowledge of spacecraft motion in orbit, their dynamics and control laws functional to the control of trajectories and the main orbital interference, and have studied orbital determination techniques
- are familiar with the space environment and the methods of representation, dynamics and stability control of spacecraft and/or robotic manipulators
- have advanced knowledge of radio communication systems, particularly ground-space connections.
Knowledge is acquired through lectures, exercises in the classroom and the production of autonomous projects in the field of spacecraft studies.
The learning outcomes will be assessed mainly through written and oral exams, tests and oral and multimedia presentations.
Applying knowledge and understanding:
Area 1: FURTHERING BASIC KNOWLEDGE
2nd cycle Graduates

- are able to use their knowledge of theoretical and scientific aspects of mathematics, physics and other general sciences to interpret and describe engineering problems;
- are able to assess the limits of the numerical instruments available and choose those most suited to the specific case

The ability to apply knowledge and understanding is achieved through lectures and the performance of numerical exercises in workshops.

These skills are assessed at the same time as the assessment of knowledge.

Area 2: AEROSPACE AND GENERAL ASTRONAUTICAL ENGINEERING

2nd cycle Graduates

- are able to propose advanced descriptions of aerospace problems.
- are able to identify, formulate and solve complex and interdisciplinary problems also using innovative methods;
- are able to design, plan, develop and manage complex and/or innovative systems, processes and services;
- are able to design and manage highly complex experiments;
- are able to apply analytical tools and knowledge of advanced technologies used in the sector also to other key areas of engineering;
- are able to use and develop general and sectoral technical and scientific software
- understand the general organisational structure of a typical large-scale aerospace project.

The ability to apply knowledge and understanding is achieved through lectures, research and practical case studies proposed by the professors, numerical and practical exercises in workshops, individual and group project work included in the course units.

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

Area 3: AERONAUTICAL ENGINEERING

2nd cycle Graduates

- are able to summarise design works to present an overview of the typical products and processes of the aeronautical world
- are able to solve even highly complex engineering problems in the aerospace engineering field
- are able to produce physical/mathematical models to analyse aircraft features and performance, the structure of the physical environment they move in and apply them also using simulation techniques;
- are able to study advanced methods for the regulation and monitoring of air traffic using information processing and transmission systems in aerospace environments.

The tests, written and oral exams, reports, practical work imply the execution of specific tasks which aim to demonstrate the student's command of tools, methods and critical autonomy. During the internship, students will be assessed through the presentation of a report approved by the company tutor.

Area 4: ASTRONAUTICAL AND SPACE ENGINEERING

2nd cycle Graduates

-are able to summarise design works to present an overview of the typical products and processes of the astronautical and space world
- are able to produce physical/mathematical models to analyse spacecraft features and performance, the structure of the physical environment they move in and apply them using simulation techniques;
- are able to design draft projects for tracking systems, orbital control and stability for spacecraft

The ability to apply knowledge and understanding is achieved through lectures, research and practical case studies proposed by the professors, numerical and practical exercises in workshops, individual and group project work included in the elective course units as well as during the internship and in preparation for the final examination.

The tests, written and oral exams, reports, practical work imply the execution of specific tasks which aim to demonstrate the student's command of tools, methods and critical autonomy. During the internship, students will be assessed through the presentation of a report approved by the company tutor.

Making judgements: 2nd cycle Graduates
- have the ability to summarise,
- are able to carry out research both autonomously and under the guidance of a supervising professor;
- can keep abreast of the methods, tools and techniques of the many fields of aerospace engineering;
- are able to source, consult and interpret the main technical journals and national, European and international standards in the sector;
- are able to present and critically discuss their personal work.

Judgement skills are developed in particular through practical exercises, supervised seminars, above all during the core course units and during individual study plans in which importance is given to the alternatives demanded of the design choices.

Judgement skills are assessed through the evaluation of the students' ability to work autonomously as well as in groups during project work and workshops, and in preparation of the internship and the final examination.

Communication skills:2nd cycle Graduates:
- are able to use at least the English language fluently orally and in writing, in addition to Italian, also using the specific terminology of this discipline ;
- are able to autonomously produce technical project reports and interpret reports produced by other technicians;

- are able to work profitably in groups also with a management or coordination role;
- are able to gather, filter and interpret data and formulate autonomous opinions on their technical relevance.
- are able to effectively communicate data, information, ideas, problems and solutions to both specialist and non-specialist interlocutors.

Written and oral communication skills are developed in particular during the learning activities which also require the production of reports and written documents as well as their oral presentation. Communication skills are also acquired during the production and presentation of a final dissertation, and during the final report following the internship.

These learning outcomes are assessed mainly through written and oral exams and project work.

Learning skills: 2nd cycle Graduates:
- can keep abreast of the methods, techniques and instruments in use in the Aerospace engineering field and in particular in aerodynamics, flight mechanics, aerospace constructions and structures, propulsion systems and aerospace systems;
- possess the learning skills needed to continue studies to a higher level with a high level of autonomy (PhD or 2nd level Master's degree) in Italy or abroad, as well as to adopt the lifelong learning techniques currently required in the professional world.

Learning skills are acquired throughout the study period.

These learning skills are achieved through learning activities in all subject areas and in particular the activities carried out partly in an autonomous manner.

Learning skills are evaluated through continuous assessment during the learning activities which require the presentation of autonomously researched data as well as through tutoring activities relative to the implementation of projects and the evaluation of the self-learning skills developed during the activities in 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.

Professional Figure:
Aerospace and Astronautical Engineering

Career Opportunities:
• Aerospace, Naval, Mechanical, Processing and Car Manufacturing industries;
• Wind energy production systems
• Industries producing machinery and systems with relevance to fluid-dynamics, advanced materials and light structures, plants and plant interaction
• Airlines
• Air traffic control authorities
• Space agencies
• Airline maintenance companies

Main professional functions and competences:
The specific engineering and technical background offers graduates in Aerospace Engineering access to a wide range of occupations, also working in fields normally covered by mechanical, industrial and management engineers, including:

FLUID-DYNAMIC ENGINEER
Working also with highly complex systems, both in strictly aerospace fields and more general industrial fields, analysing fluid-dynamic fields associated with different systems, in charge of aerodynamic design. Drafts simplified physical and mathematical models to estimate aerodynamic loads. Uses numerical models to analyse motion in various aerospace and industrial applications, calculating the aerodynamic load on various elements. Uses even sophisticated calculation software with different turbulence models for non-linear analyses in different situations. Carries out experimental tests in wind tunnels or specific experimental plants and critically interprets the data.

PRODUCTION ENGINEER
Design and management of quality and production systems in manufacturing industries which apply advanced technologies in the field of materials, aerodynamics and light structures.
Guarantees the design, production, testing and management of the principal conventional and non-conventional systems, managing logistics and the optimisation of production and processes generally. Analyses and manages complex manufacturing systems, competently selecting the materials and heat treatments, assessing costs and introducing appropriate innovation in processes, equipment and aeronautical and industrial production systems generally. Plans and monitors the reliability and quality of production, and at the same time, assures innovation and positioning in the most advanced product markets.

DESIGNER-ENGINEER
Occupies positions of responsibility in design, management, coordination and development of industrial and/or research activities in public and private bodies and aerospace companies, as well as innovative activities within the freelance field. Produces design specifications, plans development and design activities for all parts and components. Designs new technical solutions starting from

the definition of specifications through to prototyping and production. Draws up physical and mathematical models to interpret the behaviour of the designed components and systems, focusing on functional improvement. Uses even sophisticated calculation software and carries out experimental tests to check the functional features of products. Produces the technical documentation required for internal production and installation at customer premises.

PLANT ENGINEER

Holds positions of responsibility in the design of individual subsystems and plants on board aeronautical and space vehicles to ensure the operational life of the system (vehicle steering and control, power output and distribution, avionics and on-board information transmission and processing electronic systems, heat control and air-conditioning systems, etc.) as well as ground systems for mission control and experimentation. Defines the functional architecture for single units, identifies the functional terms of components and the influence of the external environment and dynamic interactions on systems and subsystems, using specific survey methods, including simulation for experimental, analytical and numerical modelling.

SYSTEMS ENGINEER

Holds positions of responsibility in the study of aeronautical and space systems as a whole and the interaction and integration of subsystems within the configuration, in order to achieve the objectives of the mission. Also deals with the ground and flight experimentation of aeronautical and space systems, on-board, steering, navigation instrumentation and system control. Designs and develops methodologies, subsystems and instrumentation for special applications including remote surveying.

MISSION ENGINEER

Draws up physical and mathematical models for performance analysis. Studies the influence of aircraft centring on stability and controllability features and of configuration on take-off and landing performance. Designs subsystems and ground instrumentation to measure trajectories and orbits and for data acquisition and transmission. Uses calculation software to optimise trajectories to reduce atmospheric and noise pollution. Critically analyses the data from previous missions. Provides consulting for accidents. Studies international air traffic control laws.

MATERIALS ENGINEER

Working also with advanced systems, both in strictly aerospace fields and more general industrial fields, this professional figure possesses widespread knowledge in the preparation, processing and applications of materials, using the competences acquired both on structural materials (metals and polymers) and functional materials (such as advanced materials for the micro-mechanical and electronic industries). In each material class, the specific competences are based on the understanding of the relations between the material micro-structure and their properties (mechanical, thermal, electrical, etc.), competences underlying the basic common training of industrial engineers. Materials engineers also have the tools required for material characterisation, processing and functionalisation and is able to choose materials and production processes to suit a given component, considering the influence of transformation and subsequent processing on the structure and properties of the material.

MANAGEMENT AND MAINTENANCE ENGINEER

Based on in-depth theoretical and scientific knowledge of even highly complex systems in both specific aerospace and more general industrial fields, they hold organisational and managerial roles requiring basic technological competences, particularly in the analysis and management of production and logistical processes and company management processes. They are also able to critically analyse and solve problems affecting the management and control of airline fleets, aircraft maintenance, also concerning the modification and certification of systems and plants, the management of operational, administrative and technical-commercial processes.

Main professional competences:
• Ability to work in research, design and development areas, investigating the new frontiers of technology, not only using advanced components and methodologies but also developing new ones for innovative applications or improved cost-performance ratios
• Ability to work with knowledge from different fields of aerospace engineering: Flight Mechanics, Structures and Materials, Plants and Systems, Fluid-dynamics and Propulsion
• Ability to manage complex projects pushing performance to the limits of technological feasibility, developing new components and subsystems and using innovative methods and procedures.

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:

De Angelis, Elisabetta	Morigi, Serena	Seccia, Leonardo
De Crescenzio, Francesca	Paolini, Enrico	Talamelli, Alessandro
Giulietti, Fabrizio	Persiani, Franco	Tortora, Paolo
Guidetti, Davide	Ponti, Fabrizio	Troiani, Enrico

Contract teaching staff:

Alessi, Elisa Maria
Alfredsson, Per- Henrik
Avanzi, Alessandro

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 OFA, 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

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)
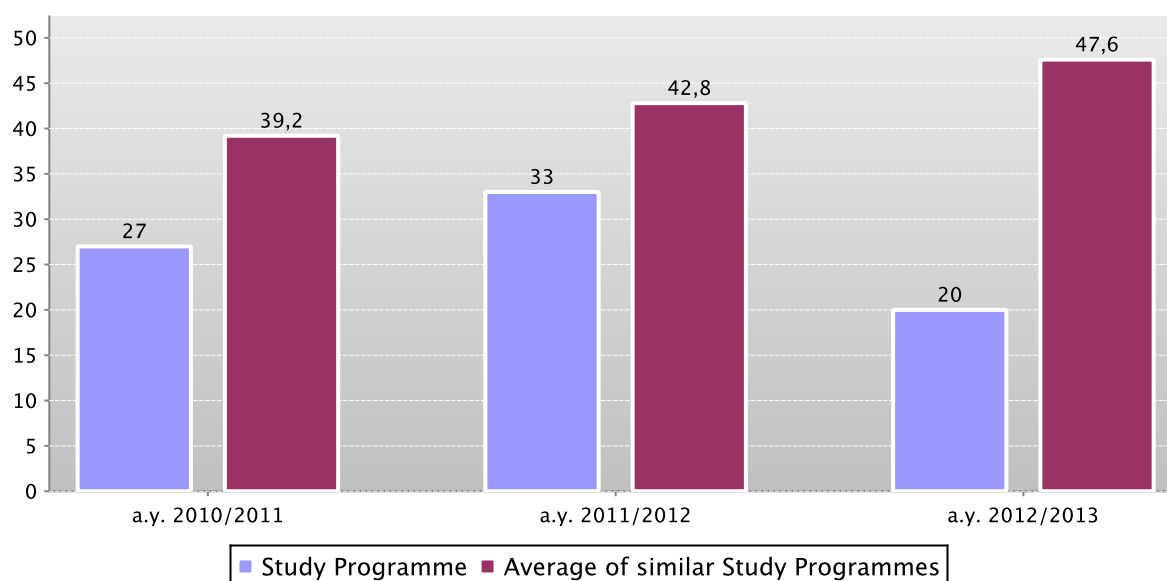
Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

	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	27	53	33	83	20	80
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 homogeneus 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.

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

		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	27	18,5%	18,5%	11,1%	51,9%		85,2%	14,8%	25,9%	44,4%	29,6%
	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	33	15,2%	30,3%	3,0%	51,5%		90,9%	9,1%	21,2%	63,6%	15,2%
	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	20		25,0%	5,0%	70,0%		90,0%	10,0%	35,0%	30,0%	35,0%
	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	74,1%	3,7%		22,2%	10 INGEGNERIA INDUSTRIALE	77,8%	7,4%	29,6%	14,8%	14,8%	11,1%	22,2%
	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	97,0%			3,0%	10 INGEGNERIA INDUSTRIALE	78,8%	12,1%	45,5%	18,2%	15,2%	6,1%	3,0%
	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	65,0%	15,0%		20,0%	L-9 INGEGNERIA INDUSTRIALE	50,0%	5,0%	45,0%	20,0%	5,0%	5,0%	20,0%
	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

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)
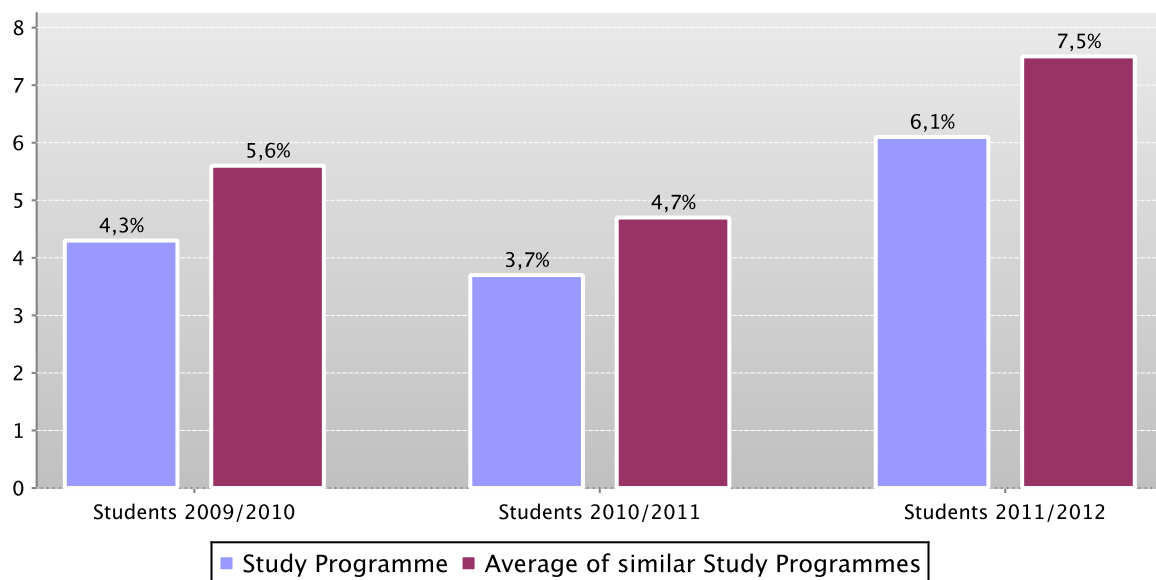
Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

		New careers	% withdrawals	% passages and transfers	% repeating students	Students enrolled in the second year
Students 2009/2010	Study Programme	23	4,3%	0,0%	0,0%	22
	Average of similar Study Programmes	40,5	5,6%	0,8%	0,1%	37,9
Students 2010/2011	Study Programme	27	3,7%	0,0%	0,0%	26
	Average of similar Study Programmes	39,2	4,7%	0,7%	0,0%	37,1
Students 2011/2012	Study Programme	33	6,1%	0,0%	0,0%	31
	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 accademic year.

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

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

■ Graduates aligned with the exam schedule ■ Passages transfers and withdrawals
■ Students still enrolled and not yet graduated

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

		New careers	Regular graduates		Passages transfers and withdrawals		Students still enrolled and not yet graduated	
			N.	%	N.	%	N.	%
Students 2009/2010	Study Programme	23	2	8,7%	1	4,3%	20	87,0%
	Average of similar Study Programmes	40,5	17	42,0%	4,3	10,7%	19,1	47,2%
Students 2010/2011	Study Programme	27	9	33,3%	1	3,7%	17	63,0%
	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 Aerospace Engineering (code 0229) 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*

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)
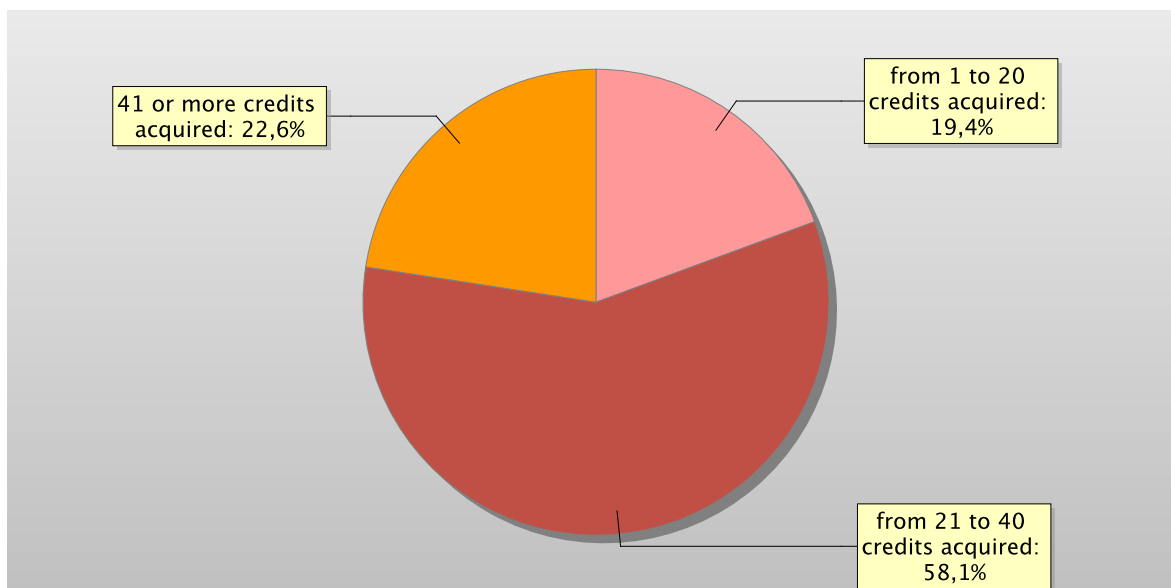
Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

		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	22	9,1%	40,9%	40,9%	9,1%	20,3
	Average of similar Study Programmes	37,9	8,1%	22,8%	42,5%	26,7%	29
Students 2010/2011	Study Programme	26	3,8%	3,8%	69,2%	23,1%	33
	Average of similar Study Programmes	37,1	6,8%	17,0%	45,8%	30,4%	31,2
Students 2011/2012	Study Programme	31		19,4%	58,1%	22,6%	31,3
	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 aerospaziale (code 8197)

	N. of exams passed	Average grade *
34794 ANALISI NUMERICA LM	21	27,8
34963 METODI MATEMATICI PER L'INGEGNERIA LM	23	23,6
35310 AERODINAMICA APPLICATA LM	23	27,8
35311 DINAMICA DEL VOLO LM	26	26,8
35312 CONTROLLO AUTOMATICO DEL VOLO LM	23	28,4
35313 SISTEMI DI PROPULSIONE AVANZATI LM	33	28,6
35314 ELETTRONICA APPLICATA ALL'AEROSPAZIO LM	21	26,7
35316 STRUTTURE E MATERIALI AEROSPAZIALI LM	38	28,8
35317 FONDAMENTI E METODI DELLA PROGETTAZIONE PER L'INDUSTRIA AEROSPAZIALE LM	28	29,8
35319 AEROMOBILI A DECOLLO VERTICALE LM	41	28,6

	N. of exams passed	Average grade *
35321 DINAMICA E CONTROLLO ORBITALE LM	8	29,1
35322 DINAMICA E CONTROLLO D'ASSETTO LM	2	
35324 FLUIDODINAMICA COMPUTAZIONALE LM	1	
35325 COMPLEMENTI DI FLUIDODINAMICA LM	5	
37571 TOLLERANZA AL DANNO DI STRUTTURE AERONAUTICHE LM	36	28,5

* 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 aerospaziale (code 8197)
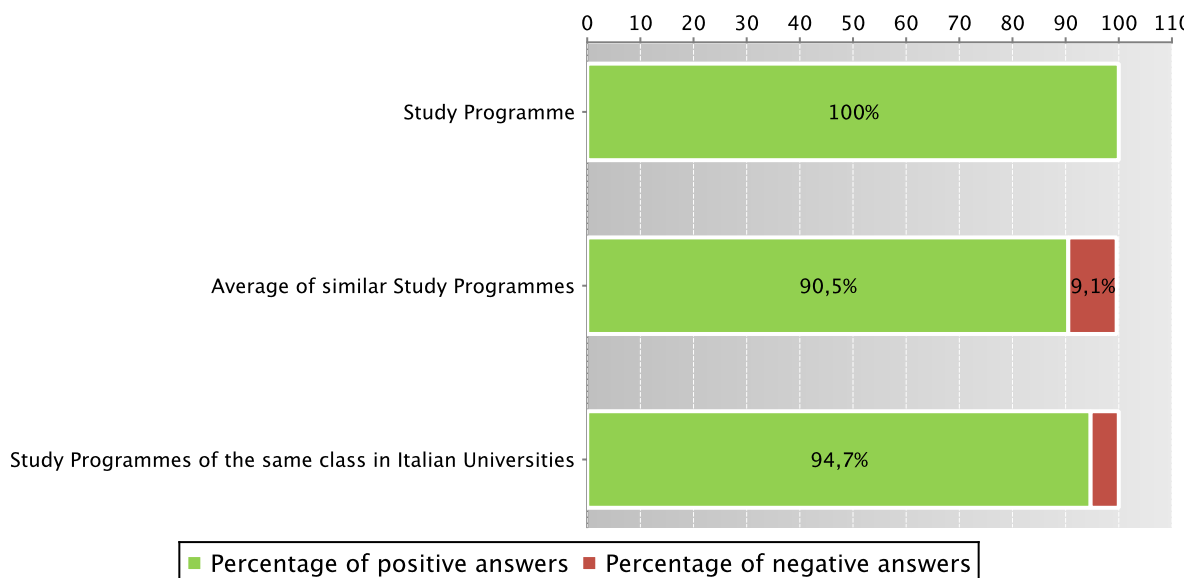
Data of the Study Programme D.M. 270/04 Ingegneria aerospaziale (code 8197)

		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	2	2		
	Average of similar Study Programmes	20	19,4	90,0%	78,4%
	Study Programmes of the same class in Italian Universities	46	44	93,2%	79,5%
2012	Study Programme	8	8	100,0%	100,0%
	Average of similar Study Programmes	22	21,5	90,5%	78,6%
	Study Programmes of the same class in Italian Universities	161	150	94,7%	81,3%

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 Aerospace Engineering (code 0229) 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 aerospaziale (code 8197) and of the Study Programme D.M. 509/99 Ingegneria aerospaziale (code 0229)
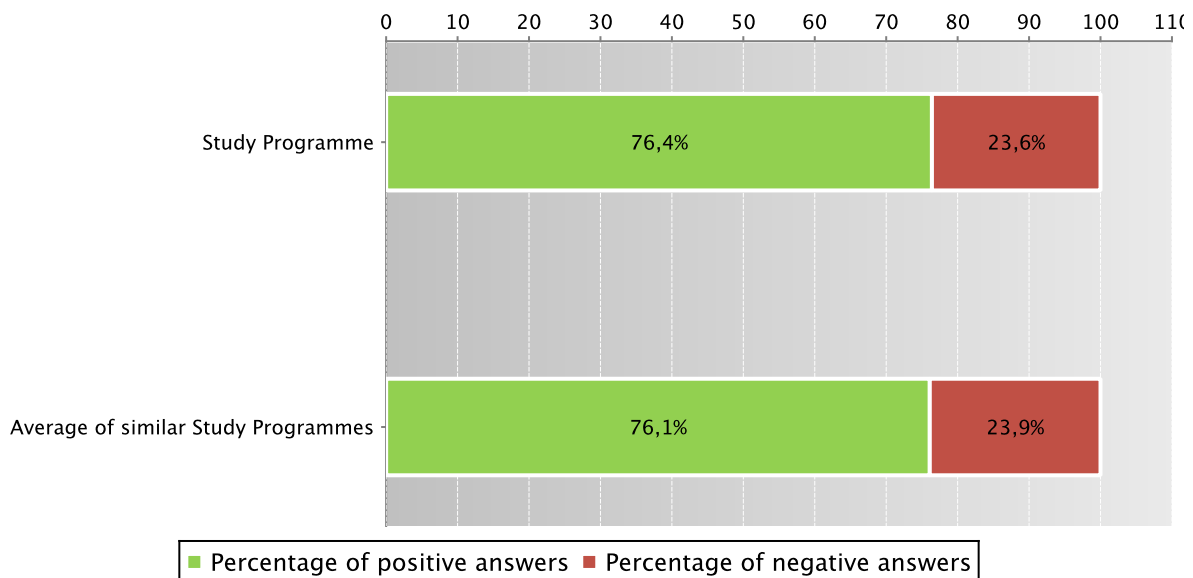
Data of the Study Programme D.M. 270/04 Ingegneria aerospaziale (code 8197) and of the Study Programme D.M. 509/99 Ingegneria aerospaziale (code 0229)

		Number of completed questionnaires	% of positive answers concerning the general satisfaction with the course unit – Question 19
a.y. 2009/2010	Study Programme	165	75,0%
	Average of similar Study Programmes	386,1	77,1%
a.y. 2010/2011	Study Programme	325	65,5%
	Average of similar Study Programmes	372,6	77,9%
a.y. 2011/2012	Study Programme	353	76,4%
	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

Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)
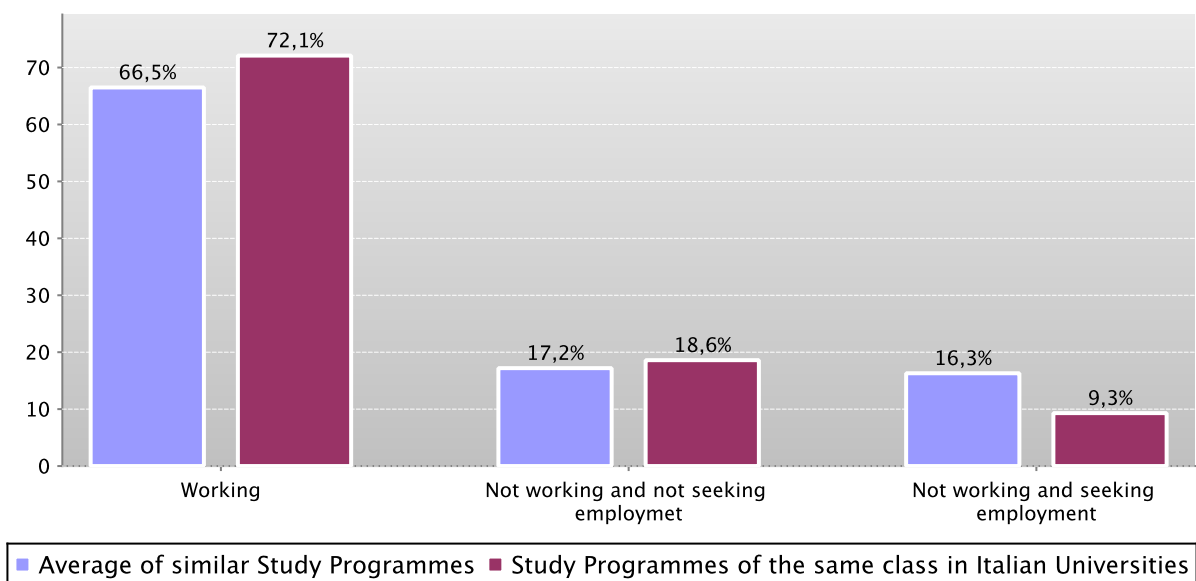
Data of the Study Programme D.M. 270/04 Aerospace Engineering (code 8197)

		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 employmet	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	2						
	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	43	72,1%	18,6%	9,3%	16,3%	61,3%	32,3%

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 Aerospace Engineering (code 0229) 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.
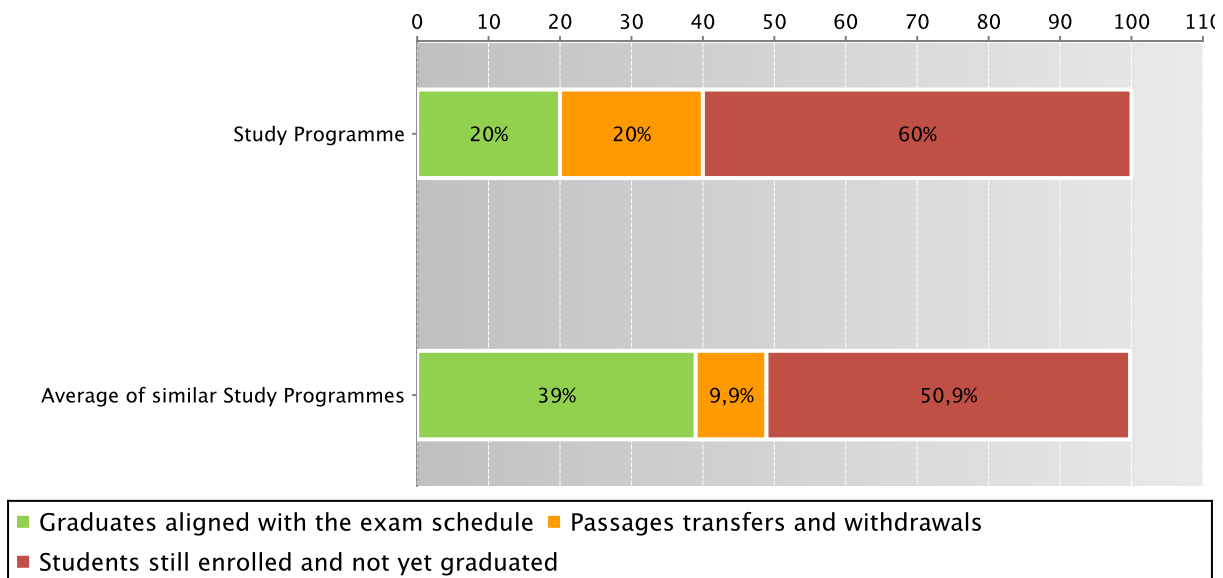
D.5.2.2. REGULAR GRADUATES

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 Aerospace Engineering (code 0229)

Data of the Study Programme D.M. 509/99 Aerospace Engineering (code 0229)

		New careers	Regular graduates		Passages transfers and withdrawals		Students still enrolled and not yet graduated	
			N.	%	N.	%	N.	%
	Study Programme	15	3	20,0%	3	20,0%	9	60,0%
Students 2008/2009	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 aerospaziale (code 0229)
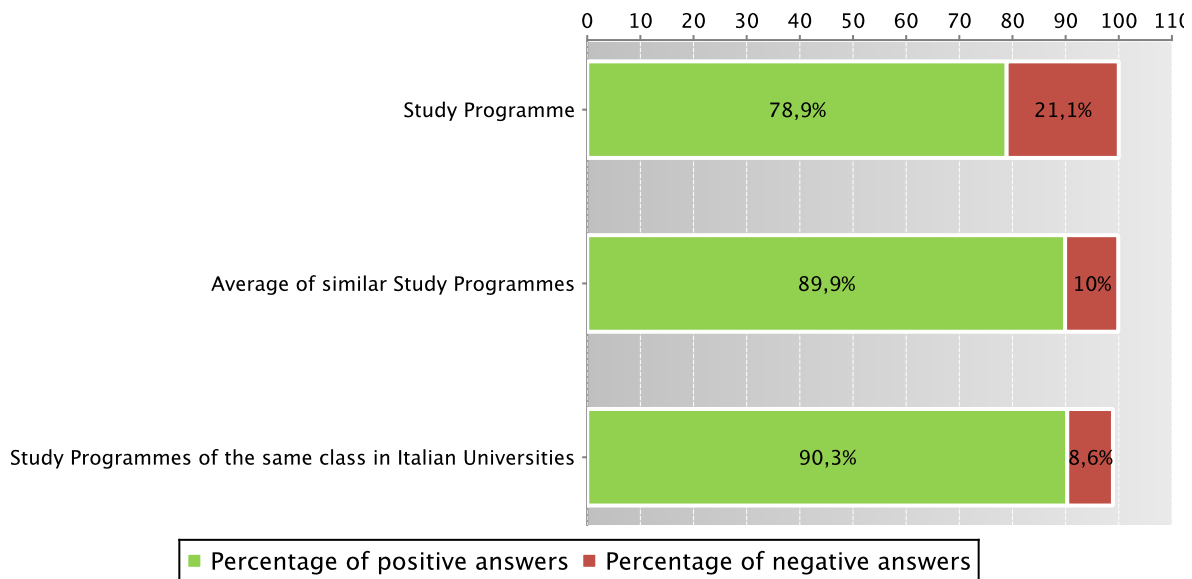
Data of the Study Programme D.M. 509/99 Ingegneria aerospaziale (code 0229)

		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	20	19	78,9%	57,9%
	Average of similar Study Programmes	25,5	24,8	89,9%	78,6%
	Study Programmes of the same class in Italian Universities	287	279	90,3%	78,5%

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 Aerospace Engineering (code 0229)
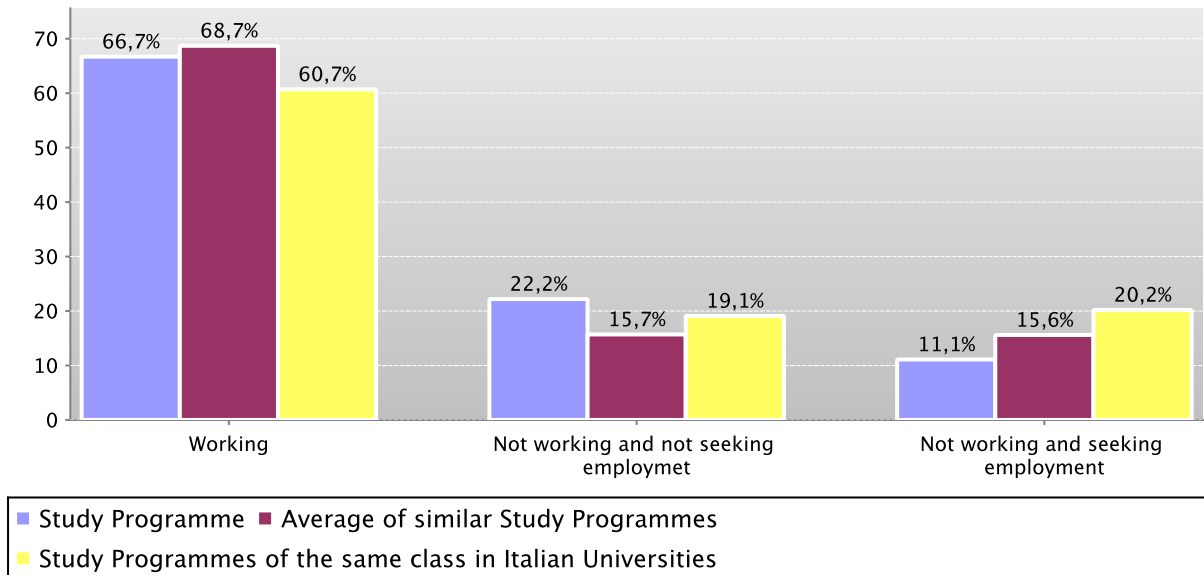
Data of the Study Programme D.M. 509/99 Aerospace Engineering (code 0229)

		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 employmet	Not working and seeking employment	Not working, not seeking employment, but following a university programme/traineeship (2)	Effective / very effective	Quite effective
Graduation Year 2009	Study Programme	28	64,3%	14,3%	21,4%	3,6%	55,6%	16,7%
	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	285	48,8%	22,8%	28,4%	16,8%	49,6%	32,6%
Graduation Year 2010	Study Programme	18	66,7%	22,2%	11,1%	22,2%	50,0%	41,7%
	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	262	60,7%	19,1%	20,2%	14,5%	53,2%	37,7%

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.

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
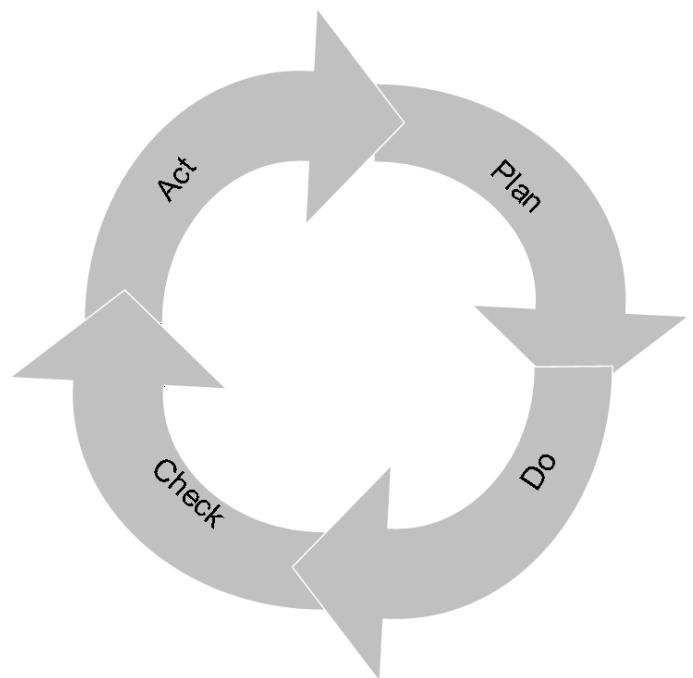
This path responds to the expectations of students, guides teaching behaviour and provides indicators for the assessment of results. Self-assessment is based on the analysis of significant data (for example, the number of students graduating in line with the exam schedule, students' opinions and the 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
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.	Academic Bodies
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.	Schools and Study Programmes
Internal audit The results of the self-assessment process are reviewed in the following phases: • 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.	Quality Manager Vice Rector for Teaching and Education Academic Bodies

• **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.