The self-assessment report for degree programme accreditation

Grau en Enginyeria Informàtica (GEI)

Màster universitari en Enginyeria Informàtica (MEI)

Master in Innovation and Research in Informatics (MIRI)

Master in Artificial Intelligence (MAI)

Facultat d'Informàtica de Barcelona

Universitat Politècnica de Catalunya

February 2021

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A. About the Accreditation Procedure

General Data

Website of the Higher Education Institution	http://www.fib.upc.edu/en http://www.upc.edu
Faculty/Department offering the Degree Programme	FIB-Facultat d'Informàtica de Barcelona (Barcelona School of Informatics) UPC-Universitat Politècnica de Catalunya (Technical University of Catalonia)

This document describes the Self-Assessment Report (SAR) for the accreditation of four Informatics degree programmes at the Barcelona School of Informatics (in Catalan Facultat d´Informàtica de Barcelona, FIB) at the UPC-BarcelonaTech (Universitat Politècnica de Catalunya). UPC is a public university in Spain devoted to higher education and research, specialised in the fields of engineering, architecture and applied science**.**

Two agencies are involved in the accreditation process. AQU Catalunya (*Agència per a la Qualitat del sistema Universitari a Catalunya*) and ASIIN (*Akkreditierungsagentur für Studiengänge der Ingenieurwissenschaften, der Informatik, der Naturwissenschaften und der Mathematic)*. FIB is applying both to AQU and ASIIN (through the AQU-ASIIN partnership). In addition, FIB is also applying to the Euro-Inf quality label, which is awarded to degree programmes at Bachelor and Master level that comply with the "Euro-Inf Framework Standards and Accreditation Criteria for Informatics Programmes". EQANIE (European Quality Assurance Network for Informatics Education, which ASIIN is a member of) is the body responsible for this seal.

Self-assessment report development

Self-Assessment Report team

The preparation of this Self-Assessment Report has been in charge of a specific internal assessment committee: the Internal Evaluation Committee (in Catalan, CAI, *Comitè d'Avaluació Interna*).

Person in charge	Position	
Josep Fernandez	Dean	Academic staff
Lluís Belanche	Vice-dean/head of Academic Studies	Academic staff
Gemma Sesé	Vice-dean/head of Academic Studies for Initial Phase	Academic staff
Daniel Jiménez-González	Vice-dean of Postgraduate Studies	Academic staff
Montserrat Maureso	Academic secretary	Academic staff
Ramon Sangüesa	Vice-dean of Quality	Academic staff
Joan Antoni Pastor	Vice-dean for Institutional Relations	Academic staff
José Manuel Diéguez	Head of the UGEGM FIB Unit at UTG CNTIC	Support staff
Rosa Mª Martín	Head of the ICT Unit at UTG CNTIC	Support staff
Rosa Anglés	Support Staff for Quality	Support staff
Maribel Castillo	Support Staff	Support staff
Albert Obiols	inLAB support Staff	Support staff
Enric Mayol	Instructor	Academic staff
Marina Alapont	GEI student	Student
Joaquim Ferrer	GEI student	Student
Carlota Catot	MEI student	Student
David Alvarez	MIRI student	Student
Victor Gimenez	MAI student	Student
Carlos Navarro	Professional and member of FIB Quality Committee	Professional

Self-Assessment Report development process

GEI, MEI, MAI and MIRI were accredited by AQU/ASINN in October 2016, and the three degree programmes (GEI, MEI and MIRI) that applied for the Euro-Inf label, obtained their label accreditation by ASINN on 30 September 2016 (E.0.1.12). Consequently, the next accreditation process for MEI, MIRI and MAI has to take place in the academic year 2020/2021 (every four years). Regarding GEI, MEI and MIRI Euro-Inf labels expire in September 2021 (every five years). Finally, GEI accreditation will have to take place in the academic year 2022/2023 (every six years).

In order to arrange the accreditation and renewal of the euro-inf label for the 4 degrees, it has been requested to carry out these processes throughout the academic year 2020/2021.

After having checked with the AQU this possibility, the following calendar has been scheduled:
● October 2020. Constitution of the CAI.
● From 20/10/2020 to 10/1/2021. Collection of data and evidence, and drafting of the self-report. Weekly follow-up by the faculty management team and regular CAI meetings.
● 11/01/2021. Delivery of the 1st version of the self-report to the GPAQ.
● From 12/01/2021 to 22/01/2021. Technical review of the GPAQ self-report.
● From 22/01/2021 to 14/02/2021. Inclusion of new contents elaborated as a result of the technical revision of the GPAQ.
● 15 to 22 February 2021. Public exhibition of the document. This phase has been done through the accreditation section of the degrees included in the quality section of the centre. Members of the community and other interest groups are informed via email. This stage is very positively valued because it enables feedback from other agents not involved in writing the self-report.
● 23 February. CAI meeting. Presentation and approval of the final self-report for discussion.
● 24 February. Approval of the self-report to the Standing Committee of the centre (evidence Standing Committee Announcement).
● 4 March. Delivery to GPAQ-UPC of the final version to refer it to AQU/ASINN.

Self-Assessment Report evaluation

All CAI members contributed to develop the self-assessment report with highly satisfactory compliance. The whole FIB community also cooperated to meet the needs of this task.

The evidence and information used for the elaboration of the document have been considered sufficient and appropriate by the members of the CAI.

The quality of the evidence and information used is guaranteed because it mostly comes from the FIB's annual reports and the official UPC databases, especially from the Planning, Assessment and Quality Bureau (GPAQ). The CAI guarantees that the samples of executions provided are real samples.

During the SAR development, we call on the community for references in order to collect specific data. We received feedback on the self-assessment report publicly from 16 to 22 February.

Document Structure

This Self-assessment report includes the necessary information for the joint accreditation process carried out by AQU and ASIIN quality agencies.

The remainder of this document is structured following ASSIN Guideline for Programme Accreditation ASIIN Seal & European Networks (EUR-ACE®, Euro-Inf®, Eurobachelor®, Euromaster®) v2017.

AQU defines 6 standards for the criteria and requirements of programme assessment (2014, "Guide to the accreditation of recognised first and second cycle degree programmes"). The left-hand side of the following table shows ASSIN guidelines and criteria while their related AQU standards are indicated on the right-hand side of the same table.

ASSIN Guidelines	Standard AQU
1. The Degree Programme: Concept, content & implementation	
Criterion 1.1	S1.1 S1.2 S2.1
Criterion 1.2	S1.2
Criterion 1.3	S1.2
Criterion 1.4	S2.1 S5.1 S1.3
2.The Degree Programme: Structures, Methods & Implementation	
Criterion 2.1	S1.2 S6.1 S6.2 S6.3 S6.4 S1.4 S1.5
Criterion 2.2	S1.2
Criterion 2.3	S6.2
Criterion 2.4	S5.1
3. Exams: System, Concept & Organisation	S6.2
4. Resources	
Criterion 4.1	S4.1 S4.2
Criterion 4.2	S4.3
Criterion 4.3	S5.2
5.Transparency and Documentation	S2.1 S2.2
Criterion 5.1	S2.1
Criterion 5.2	
Criterion 5.3	S1.5
6. Quality Management: Quality Assessment and Development	S2.3 S3.1 S3.2 S3.3

Additionally, the following information required by AQU has been added:
- Context information has been included at the beginning of this document.
- Improvement plan has been summarised at the end of the report in section D. Continuous improvement process. A more detailed improvement plan has been included as an annex.
- COVID-19 specific actions have been described in different sections. A detailed description of actions taken through the pandemic period has been included in annex 2.

Whenever possible, reference is made to evidence available in English. In other cases, evidences in Catalan or Spanish are included.

Seals applied for

Name of the degree programme (in original language)	(Official) English translation of the name	Labels applied for	Previous accreditation (issuing agency, validity)	Involved Technical Committees (TC)
Grau en Enginyeria Informàtica (GEI)	Bachelor in Informatics Engineering	AQU, ASIIN, Euro-Inf® Label	AQU 15.12.2022 ASIIN EuroInf 30.09.2021	
Màster universitari en Enginyeria Informàtica (MEI)	Master in Informatics Engineering	AQU, ASIIN, Euro-Inf® Label	AQU 15.12.2020 ASIIN EuroInf 30.09.2021	
Master in Innovation and Research in Informatics (MIRI)	Master in Innovation and Research in Informatics (MIRI)	AQU, ASIIN, Euro-Inf® Label	AQU 15.12.2020 ASIIN EuroInf 30.09.2021	
Master in Artificial Intelligence (MAI)	Master in Artificial Intelligence (MAI)	AQU International mention	AQU 15.12.2020 AQU International mention 26.07.2022	

Please note that MAI is an inter-university programme including UPC, UB (*Universitat de Barcelona*) and URV (*Universitat Rovira i Virgili*) that offers a state-of-the-art education in the field of Artificial Intelligence. Arguably, such a field is playing a key role in today's IT, so FIB applies with the MAI academic programme for an internationalised mention under AQU Catalunya.

B. Characteristics of the Degree Programmes

a) Name	Final degree (original/English translation)	b) Areas of Specialisation	c) Corresponding level of the EQF[1]	d) Mode of Study	e) Double/ Joint Degree	f) Duration	g) Credit points/unit	h) Intake pace & First time of offer
Grau en Enginyeria Informàtica (GEI)	Enginyer Tècnic en Informàtica B.Sc. in informatics engineering (GEI)	Computer engineering Computing Information systems Information techn. Software engineering	Level 6	Full time / part time		8 Semesters	240ECTS	405 per year 2010-2011
Màster universitari en Enginyeria Informàtica (MEI)	Enginyer en Informàtica M.Sc. in informatics engineering (MEI)		Level 7	Full time / part time		3 Semesters	90 ECTS	50 per year 2010-2011
Master's degree in Innovation and Research in Informatics (MIRI)	Master's degree in Innovation and Research in Informatics (MIRI)	Advanced computing Computer graphics & virtual reality Computer networks & distributed systems Data science High performance computing	Level 7	Full time / part time		4 Semesters	120 ECTS	80 per year 2010-2011
Master's degree in Artificial Intelligence (MAI)	Master's degree in Artificial Intelligence (MAI)		Level 7	Full time / part time		3 Semesters	90 ECTS	50 per year 2010-2011

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[1] EQF = The European Qualifications Framework for lifelong learning

C. Self-assessment for the AQU/ASIIN/Euro-Inf Seal

The Barcelona School of Informatics (FIB)

The Barcelona School of Informatics (Facultat d'Informàtica de Barcelona, FIB) has been the teaching institution of UPC in charge of higher education in the fields of Computer Science, Computer Engineering and other related domains (E.0.1.1) since the academic year 1977/78. The FIB offers six degree programmes with curricula completely adapted to the European Higher Education Area (EHEA) together with innovative educational methodologies. The degree programmes offered are two Bachelor's degree in Informatics Engineering (GEI) and Data Science and Engineering (GCED), and four Master's degree in Informatics Engineering (MEI), Innovation and Research in Informatics (MIRI), Artificial Intelligence (MAI), and Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching (MSEC).

The FIB also supports further official degree programmes that are managed by other institutions. These degree programme studies are: Bachelor's degree in Bioinformatics (ESCI-Universitat Pompeu Fabra), Master's degree in Cybersecurity (ETSETB-Universitat Politècnica de Catalunya), Erasmus Mundus Master in Big Data Management and Analytics (Université Libre de Bruxelles), Master in Computational Modelling in Physics, Chemistry and Biochemistry (Universitat de Barcelona), and Master in Pure and Applied Logic (Universitat de Barcelona).
Moreover, two new degree programmes will be launched soon: a Bachelor's degree in Artificial Intelligence and a Master's degree in Data Science (a spin-off of the MIRI Data Science specialisation), both starting the academic year 2021/2022.

FIB requests academic staff in charge of teaching subjects in eight UPC departments (check here the departments list - evidence E.0.1.9). Their professional experience and investigation is carried out by means of different groups of research and investigation bodies (published at the website at Research and innovation - evidence E.0.1.10). "Computer science" is the thematic area with the most scientific production of the UPC. Furthermore, this area is highly concentrated in the FIB. The UPC library service produces comparative reports on scientific production versus other national and international universities that place the scientific production of the UPC (and therefore, of the FIB) as a world reference school in the field of informatics (computer science and engineering).

FIB's teaching and research activity is repeatedly recognised in the most well-known rankings across the world (E.0.1.2 -FIB ranking webpage- and E.0.1.4 -UPC ranking webpage- take a look at computer science and information system subjects). Focusing on the thematic rankings, which can show better the influence of FIB in terms of marks obtained, UPC appears in a leading position in Spain and in a quite strong position in Europe and the world. Regarding the Academic Ranking of World Universities 2020 (ARWU–Shanghai Ranking) in the field of Engineering, Technology and Computer Science, UPC is one of the two first in Spain and 151-200 in the world. As for the QS World University Rankings 2020 by Faculty, both in Engineering and Technology UPC becomes 1st in Spain and 76th in the world while in Computer Science and Information Systems is the 1st in Spain and 51-100 in the world.

In addition to these rankings, we are also positively evaluated in a couple of more rankings published recently that have a different approach. On the one hand, the Ranking ISSUE 2020 (U-Ranking, Fundación BBVA) arranges the Spanish universities under different scopes, ranking the UPC 1st in Teaching and 2nd in Research and Innovation and Technological Development. On the other hand, there is the 3rd Ranking University-Enterprise (*Fundación Everis*), where UPC appears 3rd in the field of Informatics and ICT.

The school is located on the North Campus of the UPC and has modern facilities, some of which are shared with other centres such as the Rector Gabriel Ferraté Library, entrepreneurship space, study rooms, multimedia laboratory and recording studio and reprographic, catering and banking services. There is also the student union, a centre where the school's student delegation and associations carry out their activities.

The FIB institutional website is the main website to interface with all the relevant stakeholders (staff, alumni, current and prospective students, potential employers, and informatics companies). The website provides information about the School, the bachelor degree programmes, and the master degree programmes. The school introduction summarises the main features: the school in figures (2,106 students, 443 graduates in the last full-year course, over 10,000 graduates since 1979), the school's history with a brief overview of some significant years, and employment opportunities in several sectors and professional fields.

The dean, as the highest executive authority, the dean's staff and the governing bodies carry out FIB governance (E.0.1.5): the School Board, the Standing Committee, which performs executive functions, and other specific bodies.

Each degree programme has its own specific governing body. As for the degree programmes involved in the accreditation process, their governing bodies are:
- CAGEI as the GEI Academic Committee
- CAMEI as the MEI Academic Committee
- CAMIRI as the MIRI Academic Committee
- CAIMAI as the MAI Academic Committee

Other specific bodies are a general Academic Assessment Committee, three Curricular Committees, a Quality Committee, and an Internal Evaluation Committee created on the occasion of the accreditation process. All these governance bodies are elected or appointed among staff (academic and support staff) and students. FIB Quality Assurance System (QAS) involves all this governance structure.

Academic and support staff related to FIB involve management and technical support staff (see E.0.1.6 FIB Staff) from the CNTIC Management and Support Unit (E.0.1.7 UTG CNTIC Structure), innovation support staff (see E.0.1.8 inLab FIB), and academic staff in charge of teaching subjects.

UTG CNTIC Management and Technical support staff engage 160 employees. inLab FIB team includes additional academic and technical staff as well as students for the innovation, research and technology transfer activities. inLab FIB has been recognised as a TECNIO centre by ACCIÓ, the Catalan Agency for Business Competitiveness.

Academic staff are requested to several departments (8 of the UPC, see E.0.1.9), 240 of whom collaborated last academic year with allocated teaching mainly at FIB (category distributions are detailed for Criterion 4.1 of this report). The overall number of students last academic year was 2,439. It includes the 4 new EHEA degrees submitted for accreditation (GEI, MEI, MIRI and MAI), Bachelor's degree in Data Science and Engineering (GCED), Erasmus Mundus Master in Big Data Management and Analytics (BDMA), and Master in Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching (MSEC) (see Masters).
The evolution of academic staff is: from 224 in 2015-16 to 240 in 2019-20 (E.0.1.3 and more detailed in Criterion 4.1).

Evidence E.0.1.3 also shows the evolution in the number of students evolution (enrolled and graduated):

	Students	GEI graduates	MEI graduates	MIRI graduates	MAI graduates
2016-17	2080	234	12	37	29
2017-18	2215	229	7	35	34
2018-19	2360	257	23	59	24
2019-20	2439	227	10	60	37

The overall number of students is rising according to the new degree offer within the EHEA framework. GEI was introduced during the academic year 2010/2011 with students enrolled at first and second programme year (first to fourth semester subjects). First GEI graduates were in 2012-13. First graduates for new EHEA Masters' degrees were in 2013-14.

1. The Degree Programme: Concept, content & implementation

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Criterion 1.1 Objectives and learning outcomes of a degree programme (intended qualifications profile)

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The different degrees offered by FIB cover the most significant areas of informatics engineering. FIB currently offers its 6 own programme degrees and participates in another 5 inter-centre and inter-university programme degrees.This self-assessment report concerns four Informatics degree programmes at FIB (GEI, MEI, MIRI and MAI).

The Bachelor degree in Informatics Engineering (GEI, E.1.1.1) was introduced during the academic year 2010/2011, based on the curricula designed in 2003 and in accordance with the rules stated by the EHEA. In addition, three official masters were introduced during the academic year 2012/2013: MEI (Master in Informatics Engineering, E.1.1.3), MIRI (Master in Innovation and Research in Informatics, E.1.1.5) and MAI (Master in Artificial Intelligence, E.1.1.7). The masters –except for the MEI– are taught entirely in English. The new curricula implies new teaching criteria: ECTS (European Credit Transfer System), focused on student participation, innovation in teaching methods, and use of modern educational technologies. The FIB continues to the present day on the same course of action.

The informatics degrees are officially verified by the Spanish government and then authorised by the Catalan government before they can be deployed. Since the adaptation of the Spanish university system to the EHEA framework, the structure of university studies in Spain distinguishes Bachelor degrees (4 years of study, usually 240 ECTS) and Master degrees (1-2 years, 60-120 ECTS).

The Spanish Government establishes specific rules for degrees on the so-called 'regulated professions'. Such professions (e.g. Medicine, Architecture or Engineering) have specific laws that clearly define their competences. As computer engineers in Spain have a similar status to regulated professions, the Spanish government has also defined recommendations for the development of curricula for Bachelor and Masters degrees in informatics (GEI and MEI). Any interested reader can find more information at: Spanish university system (evidence E.1.1.9), reference documentation (info AQU at evidence E.1.1.10), and Spanish Royal Decree (evidence E.1.1.11).

Bachelors and Masters are regulated by the Spanish government Royal Decree RD 1393/2007 (amended by the RD 861/2010). However, GEI and MEI programme degrees have a specific regulation (resolution 12977/2009). FIB designed GEI and MEI according to such laws, while MIRI and MAI are thematic masters. These regulations are based on international standards such as the Computing Curricula 2005 proposed by the professional associations AIS, IEEE and ACM.

GEI verification took place on 30 July 2010, and MEI verification on 19 September 2012. MIRI and MAI received the verification on 28 December 2012. GEI, MEI, MAI and MIRI were accredited in October 2016, and the three degree programmes (GEI, MEI and MIRI) that applied for the Euro-Inf label obtained their seal accreditation by ASINN on 30 September 2016. MAI, which applied for the international additional distinction, obtained it in the same accreditation process.

Degree programmes to be accredited					
Name of the programme	RUCT code	ECTS credits	Verification date	Last Accreditation year	Academic coordination/ Programme degree manager
Grau en Enginyeria Informàtica (GEI)	GRAU00000407	240	29/07/2010	2016	GEI committee / Vice-dean Head of Academic Studies
Màster universitari en Enginyeria Informàtica (MEI)	DGU000001058	90	19/09/2012	2016	MEI committee / Vice-dean for Postgraduate Studies
Master's degree in Innovation and Research in Informatics (MIRI)	DGU000001097	120	28/12/2012	2016	MIRI committee / Vice-dean for Postgraduate Studies
Master's degree in Artificial Intelligence (MAI)	DGU000001164	90	28/12/2012	2016	MAI committee / Vice-dean for Postgraduate Studies

Under the Spanish university rules, criterion 1.1 is met with the initial verification of each degree programme (GEI at 2010; MEI, MIRI, MAI at 2012).

Objectives, design competences and stakeholders' needs

The Bachelor Degree in Informatics Engineering (GEI) provides graduates with all required knowledge, skills and competences to work in the field of Informatics Engineering. GEI offers a solid training in the fundamentals of informatics engineering complemented with an advanced training in one of the five recognised areas of Informatics defined by international professional associations: Computer Engineering, Computer Science, Information Systems, Information Technology and Software Engineering.

The Master's Degree in Informatics Engineering (MEI) provides its graduates with the knowledge and hands-on experience in a wide range of information technology fields: from cloud computing to security, from computer graphics to information systems, with a focus on IT management and leadership. Graduates become the "Swiss Army knife" of IT in the organisations where they work.

The Master in Innovation and Research in Informatics (MIRI) is designed to provide a solid background in different aspects of research in informatics, while preparing its graduates to become experts in any of the fields of specialisation offered. MIRI offers 6 areas of expertise: advanced computing, computer graphics and virtual reality, computer networks and distributed systems, data science (it has been replaced by a new Master in Data Science), high performance computing and service engineering (not currently taught).

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The master's degree in Artificial Intelligence (MAI) offers an integrative and cutting-edge approach to the field and its application to real scenarios. Research and innovation in AI spans knowledge representation and reasoning, machine learning, natural language processing, autonomous agents, computer vision robotics, and visualisation. The emphasis is on practical techniques—and a solid theoretical background—for designing and constructing intelligent systems, enabling graduates from this course to apply their skills in a variety of settings. Graduates will have the skills to carry out AI research in academic and R&D environments and to identify how AI techniques can provide intelligent solutions to IT problems in companies and organisations.

The programme's design (competence profile and structure of the curriculum) meets the requirements of the discipline and complies with the required level of study according to the qualification framework in the EHEA in Spain (in Spanish, *Marco Español de Cualificación para la Educación Superior*, MECES).

The educational objectives are outlined by the description of the learning outcomes that graduates require for practising their profession. Competences are these learning outcomes, and they are a combination of knowledge, skills (intellectual, practical, social, etc.), attitudes and values that enable individuals to carry out tasks and solve problems in specific academic, professional or social settings. Under the new EHEA framework, graduates should have achieved:

● Technical competences (domain-specific or specialist competences) that are closely linked to the demands of the professional areas associated with their degree. For EQANIE, they are Conceptual Basis for Informatics, Analysis, and Design and Implementation. As for ASIIN, they are Subject-Specific-Criteria for Informatics: formal, algorithmic and mathematical, analysis, design, implementation and project management, technological, methodological and transfer, and interdisciplinary competences.
FIB defined these competences according to the Spanish government recommendations for the development of curricula for Bachelor and Masters degrees in Informatics.
● Generic competences (other professional competences, social or soft skills) to connect with society. For EQANIE, they are Economic, Legal, Social, Ethical and Environmental Context, Informatics Practice, and Other Professional Skills and Competences, and for ASIIN Social Competences and Self-Competences. UPC approved an agreement on 8 generic or transversal competences to be common to all UPC degrees: Entrepreneurship and Innovation, Sustainability and Social Compromise, Third Language, Effective Oral and Written Communication, Team Work, Solvent Use of the Information Resources, Autonomous Learning and Gender Perspective (the last one was introduced in April 2020). Furthermore, FIB defined 2 others: Appropriate Attitude towards Work and Reasoning.

The design of the four degree programmes were based on all these competences, which should be acquired across all disciplines and specialisations. In 2007, FIB established a competences committee that was in charge of working out a competences list to be fulfilled by graduates. This committee took into account stakeholders' needs by considering organisations' points of view that were related: graduates (see FibAlumni), informatics professional association (see COEINF), and informatics technologies Festivity sponsors (see Festibity). Furthermore, some surveys were conducted among 353 professionals, 79 academic staff and 150 senior students (see JENUI 2009), which provided relevant information. A competences list was delivered in 2009 to the FIB governance bodies as an initial document for the particular committee that was going to design new degrees in accordance with EHEA. Each programme website provides information about each degree programme competences. A FIB competences working group is in charge of keeping up to date those competences.

GEI competences (E.1.1.13): consists of the 10 generic competences (G1 to G10)[2] and 8 common technical competences (CT1 to CT8). GEI also has technical competences for each specialisation. GEI competences for degree subjects are available at the programme website (evidence E.1.1.14).

Master's generic competences consists of 5 of the UPC generic ones (except for the Third Language and Self-Directed Learning), the 2 FIB generic competences, and 2 more: Applying Informatics Techniques to New Application Areas, and Integrate, Describe and Explain Applicable Techniques. Master's technical competences are:
MEI competences (see E.1.1.13 and E.1.1.14): 10 general, 4 specific groups, and 1 for Final Master Thesis (CTFM)
MIRI competences (see E1.1.15 and E.1.1.16): 2 general, 4 specific groups, and 1 for Final Master Thesis (CTFM)
MAI competences (see E.1.1.17 and E.1.1.18): 4 general, 8 specific groups, and 1 for Final Master Thesis (CTFM)

A common procedure to develop domain-specific competences consists of setting different competence levels (based on Bloom's taxonomy) and then assigning them to the corresponding subjects or courses in the programme.

To develop generic competences into a comprehensive integrated experience, we propose a definition of each competence in terms of dimensions (or competence aspects), which are further defined according to third-level objectives. These objectives are integrated into the subjects that are considered suitable for this purpose. Thus, one subject may integrate dimensions belonging to different competences at different levels, which contributes to a comprehensive educational experience. The proposed definition is available at the website (see Competence maps) with some related articles.

See Criterion 1.3 for an extended analysis of competence/learning outcomes.

Criterion 1.2 Name of the degree programme

Under the Spanish university rules, this criterion is satisfied with the initial verification of each degree programme (GEI at 2010; MEI, MIRI, MAI at 2012).

Informatics is a key element of the Information Society, facilitating access and exchange of information between people or machines, systems and institutions. Today's socio-economic progress cannot be understood without the deployment of information technology. Engineers in the field of information technologies will constitute a fundamental base for the functioning of all institutions, either from within them or as part of companies that generate or offer advanced digital services.

Informatics is part of our daily lives and a science that is well known to all collectives. The evolution and applications of computer science are so extensive that its use is becoming widespread throughout human activities. It ranges from basic systems oriented to the collection and processing of information to the most advanced ones that require techniques such as software engineering, virtual/augmented reality, high performance computing, distributed systems, complex computational algorithms, artificial intelligence, data science, computer security and cryptography, and social computing among others.

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[2] General competence G10 Gender Perspective was introduced at UPC in April 2020. The development of G10 in each programme degree is a work in progress, and it is a planned action in the improvement plan.

The names of the degree programmes, in their main course language,
> Grau en Enginyeria Informàtica
> Màster en Enginyeria Informàtica
> Master in Innovation and Research in Informatics
> Master in Artificial Intelligence

are widely-known for the community and clearly reflect the aims and learning outcomes for each programme degree.

Furthermore, GEI and MEI programme degrees have a specific regulation (E.1.1.12).

Criterion 1.3 Curriculum

The learning outcomes achieved correspond to the intended training objectives and to the level of the MECES of the degree.

With regard to the structure and organisation of the GEI curriculum (see curriculum at evidence E.1.1.1), the public information included has been complemented with tables related to competences and subjects, as well as competence maps defining several aspects of the competences (dimensions) in terms of objectives at three levels. This information corresponds to the analysis of the coordination in the curriculum, specifically as it is related to the topic of coordinating the generic competences and their progress throughout the subjects with the various dimensions of competence in the new model (at 3 levels each).

For master studies, the same procedure is done and the curricula have been designed so that all learning objectives and competences are achieved. The competences for each of the subjects of the master are public and taken from the subject guides, as well as analysed and evaluated by the coordination mechanism every academic year.

For both GEI and masters, we have incorporated an automatic checking mechanism in the subject syllabus editor in order to guarantee that all the competences and objectives have been included in any of the programmed activities. This helps to double check the accomplishment of the competences of the curriculum.
As stated for Criterion 1.1, specific degree websites for GEI, MEI, MIRI and MAI include a competences section that points out which competences are associated to each degree subject/module (competences-subjects matrix).

Furthermore, syllabus include a list of competences, objectives, contents, and activities worked on the different subjects together with additional information (more information is included in Criterion 2.1).

A new improvement plan to introduce new UPC competence on gender perspective has been planned [270.M.521.2021].

Competences equivalence to Euro-Inf learning outcomes

The previously designed competences at FIB are consistent with the programme's competence profile and learning outcomes for informatics programmes, which were formulated by EQANIE in "Euro-Inf Framework Standards and Accreditation Criteria for Informatics Programmes" published in 2016 as well as competences formulated by ASIIN in "Subject-Specific-Criteria of the Technical Committee 04 –Informatics/Computer Science" in 2018.

Programme learning outcomes can be described as quality standards for knowledge, skills and competences, all of which graduates of an accredited course should have achieved as the educational basis for practicing their profession or for post-graduate studies purposes. A wide range of degree programmes fall within the general area of informatics, but all their graduates should be aware of the wider spectrum of informatics.

We show in the next three tables the equivalence between EQANIE Euro-Inf learning outcomes and competences in the GEI, MEI and MIRI degree programmes.

Table that links EQANIE Euro-Inf learning outcomes with GEI competences:

Euro-Inf Learning Outcomes - Bachelor's Programme in Informatics Engineering

Euro-Inf Learning Outcomes																
Underlying Conceptual Basis for Informatics	**Common technical competences**								Generic competences								
Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
describe and explain the essential facts, concepts, theories and mathematical methods relevant to computing, computing equipment, computer communication and informatics applications as appropriate to their programme of study	X																
outline the characteristics of relevant state-of-the-art hardware and software and their practical application	X																
outline relevant historical and current developments in informatics and show insight into possible future trends and developments	X																
apply and integrate knowledge and understanding of other informatics disciplines in support of study in their own specialist area(s)		X			X	X											
demonstrate awareness of the need for deep domain knowledge when creating informatics applications in other subject areas																X	
Analysis	**Common technical competences**								Generic competences								
Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
use a range of techniques to identify the requirements of real-world problems, analyse their complexity and assess the feasibility of their solution using informatics techniques		X															
describe a problem and its solution at varying levels of abstraction				X													

Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
select and use relevant analytic, modelling and simulation methods																	X
choose appropriate solution patterns, algorithms and data structures																	X
analyse the extent to which an informatics system meets the criteria defined for its current use and future development					X												X

Design and Implementation	Common technical competences								Generic competences								
Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
specify and design computing/network hardware/software which meet specified requirements				X													
describe the phases involved in different life cycle models used for specifying, building, testing and commissioning new systems and for maintaining existing systems		X															
select and use appropriate process models, programming environments and data management techniques for projects involving traditional applications as well as emerging application areas				X													
describe and explain the design of systems and interfaces for human-computer and computer-computer interaction														X			
apply relevant practical and programming skills to the creation of computer programs and/or other informatics artefacts				X													

Economic, legal, social, ethical and environmental context	Common technical competences								Generic competences								
Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
demonstrate awareness of the need for a high level of professional and ethical conduct in informatics and a knowledge of professional codes of conduct										X						X	

Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
explain how commercial, industrial, economic and social contexts affect informatics practice			X														
identify relevant legal requirements governing informatics activities, including data protection, intellectual property rights, contracts, product safety and liability issues, personnel issues and health & safety										X						X	
explain the importance of information privacy and security issues in relation to the design, development, maintenance, monitoring and use of informatics-based systems																X	

Informatics practice	Common technical competences								Generic competences								
Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
demonstrate an awareness of appropriate codes of practice and industry standards																X	
describe and explain management techniques appropriate to the design, implementation, testing, deployment and maintenance of informatics systems, including project management, configuration management, change management, etc., and including relevant automated techniques								X									
identify risk issues, including security, health & safety, environmental and commercial risk, and explain risk assessment, risk reduction and risk management techniques										X							
undertake literature searches and reviews using databases and other sources of information														X			
design and conduct appropriate practical investigations (e.g. of system performance), to interpret data and draw conclusions														X			

Other Professional Skills and Competences	Common technical competences								Generic competences								
Graduates of a First Cycle degree should be able to:	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	G1	G2	G3	G4	G5	G6	G7	G8	G9
organise their own work independently, demonstrate initiative and exercise personal responsibility																X	
communicate effectively both verbally and using a variety of communications media to a variety of different audiences												X					
plan self-learning and improve personal performance as a foundation for lifelong learning and ongoing professional development															X		
identify different ways of organising teams and the various roles within a team													X				
participate effectively in informatics group-working													X				

Table that links EQANIE Euro-Inf learning outcomes with MEI competences:

Euro-Inf Learning Outcomes - Master in Informatics Engineering

Outcomes for Second Cycle Degree (SCD) Programmes																									
Underlying Conceptual Basis for Informatics																									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
demonstrate either deepened knowledge of a chosen specialisation or broadened knowledge of informatics in general															X										
explain in depth relevant concepts and scientific principles appropriate to their programme of study, some of which may be from outside informatics	X																								
demonstrate awareness of topics at the forefront of their specialisation and evaluate their significance																	X								
Analysis																									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
apply appropriate analysis methods to the solution of complex problems in informatics and to assess their limitations								X																	
use fundamental knowledge to investigate new and emerging technologies and methodologies																	X								

	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
collect and analyse research data and use appropriate analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of analytical methods.															X										

Design and Implementation

Graduates of a Second Cycle degree should be able to:	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
describe and explain design processes and methodologies relevant to their subject area and be able to apply and adapt them in unfamiliar situations																X									
specify and complete informatics tasks that are complex, incompletely defined or unfamiliar																X									
apply state-of-the-art or innovative methods in problem solving, possibly involving the use of other disciplines								X																	
demonstrate that they can think creatively to develop new and original designs, approaches, methods, etc																				X					

Economic, legal, social, ethical and environmental context

Graduates of a Second Cycle degree should be able to:	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
demonstrate awareness of the need for a high level of professional and ethical conduct in informatics																					X				

	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
identify relevant legal, commercial, industrial, economic and/or social contexts appropriate to their area of study and explain their relevance																				X					
evaluate risk and information security issues relevant to their area of study																				X		X			
Informatics practice																									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
describe and explain applicable techniques and methods for their particular area of study and identify their limitations														X											
apply informatics techniques to new application areas, taking account of relevant commercial, industrial, social and environmental constraints																					X				
contribute to the further development of informatics														X	X				X						

Other Professional Competences																									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CG3	CG4	CG5	CG6	CG7	CG8	CG9	CG10	CDG1	CDG2	CDG3	CTE 1-12	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
organise their own work independently, demonstrating initiative and exercising personal responsibility																								X	
appreciate the skills required to work with and lead a team that may be composed of people from different disciplines and different levels of qualification							X															X			
undertake literature searches and reviews using databases and other sources of information																							X		
communicate effectively both verbally and using a variety of communications media to a variety of different audiences and preferably also in a second language																		X							
plan self-learning and improve personal performance as a foundation for lifelong learning and ongoing professional development																			X						

Table that links EQANIE Euro-Inf learning outcomes with MIRI competences:

Euro-Inf Learning Outcomes - Master in Innovation and Research in Informatics

Outcomes for Second Cycle Degree (SCD) Programmes																	
Underlying Conceptual Basis for Informatics	**Technical competences**							**Generic competences**									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
demonstrate either deepened knowledge of a chosen specialisation or broadened knowledge of informatics in general						X											
explain in depth relevant concepts and scientific principles appropriate to their programme of study, some of which may be from outside informatics	X																
demonstrate awareness of topics at the forefront of their specialisation and evaluate their significance						X			X								
Analysis	**Technical competences**							**Generic competences**									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
apply appropriate analysis methods to the solution of complex problems in informatics and to assess their limitations								X									
use fundamental knowledge to investigate new and emerging technologies and methodologies									X								
collect and analyse research data and use appropriate analysis tools in tackling unfamiliar problems, such as those with uncertain or incomplete data or specifications, by the appropriate innovation, use or adaptation of analytical methods.								X									
Design and Implementation	**Technical competences**							**Generic competences**									
Graduates of a Second Cycle degree should be able to:	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
describe and explain design processes and methodologies relevant to their subject area and be able to apply and adapt them in unfamiliar situations								X									

	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
specify and complete informatics tasks that are complex, incompletely defined or unfamiliar								X									
apply state-of-the-art or innovative methods in problem solving, possibly involving the use of other disciplines				X													
demonstrate that they can think creatively to develop new and original designs, approaches, methods, etc.													X				

Economic, legal, social, ethical and environmental context · Technical competences · Generic competences

Graduates of a Second Cycle degree should be able to:	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
demonstrate awareness of the need for a high level of professional and ethical conduct in informatics													X				
identify relevant legal, commercial, industrial, economic and/or social contexts appropriate to their area of study and explain their relevance													X				
evaluate risk and information security issues relevant to their area of study													X			X	

Informatics practice · Technical competences · Generic competences

Graduates of a Second Cycle degree should be able to:	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
describe and explain applicable techniques and methods for their particular area of study and identify their limitations			X														X
apply informatics techniques to new application areas, taking account of relevant commercial, industrial, social and environmental constraints													X				
contribute to the further development of informatics					X					X							

Other Professional Competences · Technical competences · Generic competences

Graduates of a Second Cycle degree should be able to:	CG1	CG2	CEC1	CEC2	CEC3	CGCB00 CEE1-5	CTFM	CB6	CB7	CB8	CB9	CTR1	CTR2	CTR3	CTR4	CTR5	CTR6
organise their own work independently, demonstrating initiative and exercising personal responsibility	X								X			X				X	
appreciate the skills required to work with and lead a team that may be composed of people from different	X												X				

disciplines and different levels of qualification														
undertake literature searches and reviews using databases and other sources of information											X			
communicate effectively both verbally and using a variety of communications media to a variety of different audiences and preferably also in a second language								X						
plan self-learning and improve personal performance as a foundation for lifelong learning and ongoing professional development								X						

Improvement plans to the degree programs include reviewing GEI, MEI, MIRI and MAI based on future changes of the Computer Curricular of the ACM [270.M.509.2021].

Criterion 1.4 Admission requirements

First, it is important that prospective and new students know in advance which are the objectives, curriculum and admission requirements for a degree programme. For that purpose, specific websites were developed. As for GEI, I love bits (E.1.4.1) includes updated information that aims to solve most of the queries that future students may have about this degree, advertising at the same time the activities we carry out for secondary school students in order to bring them closer to our studies. There is also a web for Masters (E.1.4.2) that contains the information, structure and organisation of EHEA masters.

Regarding GEI admission, FIB receives an official list from the government that is basically made using the general law of supply and demand. Candidates are ranked according to the marks obtained in the high school and in the university entrance exams. It's a common procedure for all the bachelor programmes at public universities (more information at Canal Universitats of the Catalan government).

As for master's admission, there is a specific procedure for each school. At FIB, there is an admission commission, specific for each master that evaluates the curriculum vitae and qualifications of each candidate during the admission process. They may assign specific extra preparatory courses if the CV of the applicant shows a lack of previous knowledge .Students coming from degrees that do not guarantee a solid background in informatics are assigned extra preparatory courses. The number of credits used in those preparatory courses is between 6 ECTS and 30 ECTS, being considered especially important to follow the master subjects, and in the case of MEI, to complete the computer engineering requirements. The admission is denied when more than 30 ECTS are necessary, since it is not possible to equalise competences.

The FIB masters website informs about profiles of the applicants, admission procedure, selection criteria and admitted students.

Supply and demand in the computer science labour market shows that informatics degree graduates have good prospects for placements. At Access to the labour market for graduates from Catalan universities 20 it is stated that graduates take under 3 months to find their first job, and that the majority stay in work three years after having completed their degree, especially in the case of Engineering. Detailed data related to the GEI at FIB-UPC are available at E.1.4.3.

Taking into account the number of available places and comparing them with incoming student figures, we can see that the new strategies to attract students have been successful. For instance, the cut-off entrance mark has risen and the female percentage in GEI has also increased (E.1.1.2). On the other hand, although the number of final enrolments in the master degrees has increased, there is still room for improvement (FIB main figure, E.0.1.3). As a consequence, FIB will focus on boosting knowledge and social recognition of the studies and the profession of computer engineering, as it has been done since 2016. Initiatives intended to promote the role of information technology in today's society will be highly encouraged, as well as those aiming at increasing the knowledge of techniques and tools that allow building computer systems. FIB seeks to tighten and expand contact with secondary schools to promote a better understanding of the profession and the scope of studies in computer science engineering, as well as to take the opportunity to especially influence the female group. By way of illustration, a new portal has been created to attract new incoming students, particularly girls, having been broadcast to more than 2,000 target contacts (under permission and following the new regulations of LOPD). All good indicator results show that the 2015 improvement plan has been successfully achieved.

New promotional actions to increase the number of applicants are planned [270.M.511.2021].

Bachelor degree (GEI)

GEI at FIB is the bachelor's degree with the highest demand at UPC, and 7th among all bachelor's programmes at Catalan universities (2020 cohort). Indicators corresponding to the last five cohorts of incoming students (E.1.1.2) show a positive trend both in the first-option demand from the academic years 2016/2017 up to 2020/2021 (551, 535, 575, 582 and 746) and their associated cut-off mark (8.3, 8.5, 9.4, 9.3 and 10.1 -maximum mark: 14-). That cut-off mark represents an extraordinary increase from the 6.04 corresponding to the academic year 2014/2015. Taking into account that the number of places available is 400, these figures indicate the improved academic level of new students and the effectiveness of promotional activities (see E.1.4.4 secondary school activities: open days, teaching fairs, Ramon Llull Day, etc.). Concerning the percentage of incoming women, it has been steadily increasing from 9.5% in the 2016 cohort up to 14.5% in the 2020 cohort. Even though improving those figures involves several external issues that do not depend on university decisions, such as the treatment of technology subjects at the early stages of secondary school, our promotional actions seem to point in the right direction. In addition, UPC makes attracting female talent one of its priorities and FIB participates in a UPC gender working group through the Head of Institutional Support and External Relations Unit and the Vice-dean for Communication (see gender equality programme in Catalan, evidence E.1.4.5).

The percentage of students who have chosen GEI as their first option on the pre-enrolment procedure is very high, being around 97% of the overall enrolments. This means that the vast majority of first-year students are highly motivated to undertake the degree.

It should be noted that the actual number of incoming students may exceed by up to 5% the number of available places. It is customary practice for all degrees to receive a longer list of potential students in order to find the balance against those that change their minds just a few days before registration. As for GEI, up to now that has rarely happened and it is one of the reasons for overbooking.

Most incoming students have completed secondary studies within the science or the technology specialities. Therefore, they are appropriately qualified to begin the degree. Nevertheless, a number of students have completed higher level vocational training course studies (in Catalan, *Cicles Formatius de Grau Superior*) (3.3%, 5.2%, 1.3%, 3.4% and 4.5% from 2016 to 2020) (E.1.1.2). Those students have some shortcomings in the most theoretical subjects. That is why they are offered an introductory support course (evidence E.1.4.6) prior to the start of their degree, which focuses on the study of foundations in physics and mathematics.

In order to get the best incoming students, it is necessary to take into account the results from other global indicators, which have been obtained essentially from surveys addressed to new incoming students (E.1.4.7). According to these survey results (prepared with a FIB Business Intelligence tool that collects FIB data), 84.3% of new students report having known about the degree from the centre's website, and 48.6% are planning to continue completing a master's degree. Both indicators were taken into account when designing strategies to attract students for the degree (GEI) and master's courses.

In the current context of budgetary restraint in public universities, the number of places offered for changing the university and/or university studies in the GEI has been reduced from 20 places (until 2017) to 5 (since 2018). Requests meeting the minimum requirements are prioritised according to the student's college entrance qualification and the number of credits that can be recognised. Recognition of subjects is carried out comparing topics and a record of the approved recognitions is kept to maintain a uniform approach over time.

Masters' degrees (MEI, MIRI, MAI)

Admission to the master's is performed twice per academic course (except for MAI). Undergraduate students can finish their studies in either February or June/July, so we offer them the possibility to continue in any of our master's programs with no delay. The target group of students in our master's comes from Informatics Engineering and Data Science and Engineering degrees at FIB, or at other schools. Students coming from degrees in telecommunications, electronics, industrial engineering or similar are assigned extra preparatory courses before they can begin the master's programme if their background is deemed unsatisfactory. The number of credits used in those preparatory courses is between 6 ECTS and 30 ECTS, which are considered especially important to follow the master subjects, and in the case of MEI, to complete computer engineering. The admission is denied if more than 30 ECTS are necessary, since it is not possible to equalise competences. In particular, from 2016 up to 2019, 17 students (15 for MEI, 2 for MIRI) have been asked to do some complementary courses. Only three students (two MEI students and one MIRI student) seem that they will not finish their master so far: two of them have just the TFM left, which usually means that they have started working, and the other has the TFM left and one compulsory subject that had never been enrolled. Two other MEI students are currently doing the TFM, and the rest have already finished. Therefore, 14 out of 17 students with complementary courses will potentially finish their studies with an average number of 12 extra ECTS credits (2 extra subjects), which means that they will need an extra semester at most than the ideal number of semesters of the master.
On the other hand, students will have been able to complete the computer engineering training.

We have the final new enrolled or registered students from evidences E.1.1.4, E.1.1.6 and E.1.1.8. And we also have information on the students who previously tried to enrol in these master's degrees (applicants). The following tables summarise the maximum number of students that can be registered (capacity), the number of students that apply (applicants), the number of students admitted (admitted), and the number of students that eventually register and start the master's (registered) for each master's (MEI, MIRI and MAI):

MEI	2016-2017		2017-2018		2018-2019		2019-2020	
	Sept.	Feb.	Sept.	Feb.	Sept.	Feb.	Sept.	Feb.
Capacity	50		40		40		40	
Applicants	32	22	41	18	49	3	36	3
Admitted	25	17	30	14	45	3	31	2
Registered	14	13	13	10	15	3	16	2

MIRI	2016-2017		2017-2018		2018-2019		2019-2020	
	Sept.	Feb.	Sept.	Feb.	Sept.	Feb.	Sept.	Feb.
Capacity	80		80		80		80	
Applicants	64	39	96	11	111	15	124	28
Admitted	61	32	80	9	81	12	97	22
Registered	45	20	56	9	57	7	60	14

MAI	2016-2017		2017-2018		2018-2019		2019-2020	
	Sept.	Feb.	Sept.	Feb.	Sept.	Feb.	Sept.	Feb.
Capacity	50		50		50		50	
Applicants	82		113		216		232	
Admitted	48		62		54		75	
Registered	34		36		43		33	

MEI, MIRI and MAI students' original figures show a high percentage of foreign students: 40%, 29% and 43%, respectively, considering EU students as foreign students; 37%, 20% and 27%, if we only take account of non-EU students. In the case of MEI, most of the foreign students come from North and South America, and one of the reasons is that the teaching language is Spanish. We would like to introduce English so that we can open MEI to other countries. In the case of MIRI, The majority of

foreign students come from Asia, then EU countries, and finally North and South America. Lastly, UE and Asia students are the majority of the foreign students in MAI.

New MEI students nationality	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
FIB graduates	2	5	4	3	7
UPC graduates (not FIB)	2	6	6	2	5
Catalunya (not UPC graduates)	2	4	3	3	2
Spain (not Catalunya)	2	1	1	1	-
EEC (not Spain)	-	1	-	2	-
Europe not EEC	-	-	1	-	-
North and South America	5	10	8	6	5
Asia	1	-	-	1	-
Africa	-	-	-	-	-
Oceania	-	-	-	-	-
New MIRI students nationality	**2015-2016**	**2016-2017**	**2017-2018**	**2018-2019**	**2019-2020**
FIB graduates	26	26	25	22	31
UPC graduates (not FIB)	5	5	7	5	4
Catalunya (not UPC graduates)	5	5	5	5	17
Spain (not Catalunya)	5	5	9	15	5
EEC (not Spain)	4	7	6	9	3
Europe not EEC	1	3	-	1	1
North and South America	4	5	6	3	8
Asia	7	9	6	4	8
Africa	-	-	1	-	-
Oceania	-	-	-	-	-

New MAI students nationality	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
FIB graduates	7	5	2	12	8
UPC graduates (not FIB)	3	2	6	4	1
Catalunya (not UPC graduates)	5	6	5	6	6
Spain (not Catalunya)	5	5	6	7	6
EEC (not Spain)	5	6	9	5	5
Europe not EEC	-	2	1	-	2
North and South America	5	5	5	5	6
Asia	8	3	-	4	1
Africa	2	-	2	-	-
Oceania	-	-	-	-	-

Master's admission exceeds the number of places offered, but registration figures are below capacity. We have been working in two directions: firstly, to increase the number of admitted students that end up registering. Secondly, putting efforts into increasing the number of applicants. Both approaches are related to the global FIB improvement plan.

Part of this plan is to promote the master's studies through special sessions directly addressed to our undergraduate students. The percentages of the new master's students belonging to the GEI and UPC studies in 2019/2020 were the 36.8% in the case of MEI, 40.3% for MIRI and 10.38% for MAI. However, our intention is not only to promote both at FIB and UPC, but also at an European and global level to benefit the internationalisation of our masters. In the case of MEI, it is more targeted at Spanish-speaking countries, limiting the number of abroad students and the home universities. With respect to MAI and MIRI, the number of international students is, in average, 29.4 and 43.4%, respectively. These master's degrees are open to any students with the required level of English (B2).

Internationalisation of the MAI educational programme

Artificial Intelligence (AI) research is interdisciplinary by nature and draws on computer science, mathematics, statistics, biology, neuroscience, cognitive science, linguistics, ethics, psychology and law. Research in AI at the consortium of Catalan universities supporting this programme spans knowledge representation and reasoning, machine learning, natural language processing, autonomous agents, computer vision, robotics, and visualisation.

MAI degree programme lays emphasis on practical techniques and a solid theoretical background for designing and constructing intelligent systems, enabling graduates from this course to apply their skills in a variety of settings. These skills are in high demand in the market. Graduates of this programme have a good overview of the main AI techniques and an in-depth understanding of how

to apply them in at least one area within multi-agent systems, reasoning, data analytics, natural language processing and deep learning. Moreover, graduates also have the skills to carry out AI research in academic and R&D environments and to identify how AI techniques can provide intelligent solutions to IT problems in companies and organisations.

MAI is taught entirely in English. This programme is addressed to national and international students who wish to acquire advanced knowledge in AI in order to occupy positions of responsibility in the industry, the public sector and academia in Catalonia, Spain or abroad. The programme covers many research areas related to the design, analysis and application of AI and was modified in 2017 to adapt its contents and focus of interest.

The admission requirements for the UPC's official masters can be found at What are the requirements to enrol in a master's degree? However, candidates must provide proof of their English proficiency. The Academic Committee is in charge of the admission decisions of the candidates. The criteria are: academic information (50%), background and professional experience (40%) and motivation (10%).

The criteria details as follows:

Academic information:
- Final average grade for the undergraduate degree that provides access to the master's degree
- Ranking of the university issuing the previous degree, using the most common rankings (e.g. ARWU, QS World University, etc.)
- Academic performance on the previous degree

Background and professional experience:
- Suitability of the candidate's previous degree. Holders of bachelor's degrees in disciplines in the field of Computer Science and Mathematics will be given preference, but candidates from other disciplines are welcome
- Experience in innovation and research projects
- Additional university degrees

Motivation:
- Candidate's resume and motivation letter

MAI, as well as the other EHEA degree programmes at FIB, has a wide range of mobility possibilities (at Mobility in evidence E.1.4.8), both for students and academic staff.

MAI, as an EHEA degree programme, is a 90 ECTS degree (three semesters, full time). At present, FIB is adapting these mobility agreements to the MAI degree programme, examining the implementation of double diploma agreements (improvement plan: new double degrees agreements within the UNITE consortium and other potential partners for all masters and GEI [270.M.510.2021]). In particular, the UPC is currently working in a possible UNITE university consortium to develop an AI master among different universities, where MAI may actively participate.

Internationalisation of MAI academic staff

The academic staff, MAI Faculty, concerns an important academic group from UPC, UB and URV. They meet the qualifications requirements for programme delivery, and they have sufficient and recognised teaching, research and, where applicable, professional experience.

A total of 42 teachers have participated in MAI during the academic year 2019/2020. Permanent teachers carried out 88,5% of the teaching activity (11,5% taught by non-permanent teachers). 90,7% of the teaching activity is carried out by PhD holders (9,3% taught by holders of just a master's degree).

Criterion 4.1 includes detailed information about MAI academic staff.

Internationalisation MAI results

Although MAI is a course of 90 ECTS, it has a high number of international participation. It can be noticed when looking at the amount of international students enrolled (not from Spain) and the number of students doing mobility, incoming students, and the international graduate students:

	2015-16	2016-17	2017-18	2018-19	2019-20
Number of international graduates	8	13	18	11	10
Number of international students enrolled	20 (50%)	16(47%)	17(47.2%)	14(32%)	14(40%)
Mobility students (incoming) participating in MAI	22	19	23	25	32

2. The Degree Programme: Structures, Methods & Implementation

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Criterion 2.1 Structure and modules

The programme's design (competence profile and structure of the curriculum) meets the requirements of the discipline and complies with the required level of study according to the qualification framework in the EHEA in Spain (in Spanish, *Marco Español de Cualificación para la Educación Superior*, MECES). This verification ensures that all degree programmes are divided into modules. Each module is a sum of teaching and learning whose contents are concerted. With its choice of modules, the structure ensures that the learning outcomes can be reached and allows students to define an individual focus and course of study. The curriculum is structured in a way to allow students to complete the degree without exceeding the regular course duration. The modules have been adapted to the requirements of the degree programme. They ensure that each module's objectives help to reach both the qualification level and the overall intended learning outcomes.

Planning, delivery and assessment are adequate for enabling achievement of the learning outcomes, and are consistent with the intended ones that correspond to the appropriate level for the programme in the European Higher Education Area (EHEA) at adequate rates. Bachelor degree (GEI) and Masters' degrees (MEI, MIRI and MAI) were designed in accordance with EHEA curricula, which implies new teaching criteria: student participation, innovation in teaching methods, and use of modern educational technologies. For all four programmes, and as an incentive for excellence, students' mobility is supported and promoted as well as student participation in educational activities related to university-business cooperation. The goal of these activities is to complete the training received by students at the university.

Teaching coordination mechanisms

Agents involved in the coordination processes ensure that the objectives of the courses are feasible, implementable and consistent with the assigned competences. The bachelor's degree implies a larger coordination structure than the master's because it involves more students, subjects and academic staff. The master's can be organised in an easier way, but it can also be broadened when necessary.

All degree programmes have an Academic Committee responsible for the final decisions that will be delivered to the Standing Committee for effective execution. For example, every semester subjects' teaching guides are checked and the development of the subjects is analysed. If needed, the modifications proposed by the professors are discussed before being presented to the Academic Committee.

In addition, generic competences or professional skills deserve specific coordination due to their cross-disciplinary nature. This is called transversal coordination, and there has been appointed a coordinator to each one.

Bachelor degree (GEI)

Several coordination mechanisms have been devised for the Bachelor Degree in Informatics Engineering (GEI), which are clearly described on the website (E.2.1.3). The existence of these mechanisms is one of the strengths of the programme. They have facilitated both the allocation of different levels of competence in all subjects, making it accessible to everyone, and the monitoring of their degree of achievement.

The academic staff responsible for the subjects constitutes the first level of coordination mechanisms, and this is usually a senior or expert professor. They are proposed by the department in charge of teaching a given subject, and it must be ratified by the school. They should be partners among the school and the instructors who teach the course, and they must coordinate the relationships with students. The Standing Committee of the School Board approved the rules governing the functions on 20/05/15 (see the corresponding Standing Committee minutes, evidence E.2.1.4).

The common compulsory subjects of the GEI are divided into five areas, each of which has a coordinator. The coordinator's partners for each of these areas are those responsible for the subject, and their basic function is the vertical coordination of objectives, contents and activities of the subjects involved. Each specialisation of the GEI has also been appointed a coordinator, who is also in charge of the vertical coordination with the common block.

To assure the uniform distribution of the subject load that a student may register for throughout the semester, there also exists what is known as horizontal coordination. The horizontal coordination corresponding to the first two semesters (early stage) is the responsibility of the vice-dean Head of Academic Studies for Initial Phase (early stage), while the horizontal coordination of the other common compulsory subjects is performed by the vice-dean Head of Academic Studies. The specialisation coordinator takes responsibility for the horizontal coordination of each of the five specialisations. All this coordination may use student surveys about subject workload: "ECTS project" in the yearly Academic Report (in Catalan, see Annual reports evidence E.0.1.2 at the bottom).

All coordinators meet at least once a year with both Heads of Academic Studies. The ultimate responsibility for the coordination of studies lies with the Head of Academic Studies.

CAGEI (GEI Academic Committee) is the specific committee relevant to GEI teaching coordination that meets regularly. This academic committee together with some (three) curricular assessment committees deliver agreements to the executive Standing Committee. Evidence E.0.1.5 at School Governance Specific Committee shows the current composition and regulation for each committee. CAGEI minutes display decision-making processes adapting regulations to academic needs (evaluation regulations, academic staff assignment to specific tasks like first course subject responsibility).

Masters' degrees (MEI, MIRI, MAI)

All masters have the same coordination structure. The coordination is implemented at three different levels: at the programme year, the area (i.e. group of courses in the same area) and the global level. For each master, the names of all these coordinators and their functions are published. The area coordinator is responsible for distributing the learning objectives and competences among the courses in the area. The global coordination ensures the coordination among areas and semesters. This global coordination is one of the tasks of the Master's Academic Committee, and there is one committee for each Master's: CAMEI (MEI Academic Committee), CAMIRI (MIRI Academic Committee) and CAIMAI (MAI Academic Committee). Academic committees regularly meet and deliver agreements to the executive Standing Committee. In the case of MAI, which is an interuniversity programme including UPC, UB (Universitat de Barcelona) and URV (Universitat Rovira i Virgili), it also has the goal to coordinate the three university teams.

Each Master's Academic Committee is composed of several professors (according to the departments involved in the master's programme), the school management (Dean, Vice-Dean) and school staff (Head of the Bachelor's and Master's Degree Management Unit). The current composition and regulation for each specific committee is shown at E.0.1.5. The duties of the

Academic Committee include the coordination of areas and the supervision of the education objectives/competences/contents of the programme year subjects. No subject can change any of the above mentioned without the explicit permission of the area coordinator and this committee.

Finally, for all the masters, and with the purpose of better coordination among subjects, specific meetings for common compulsory subjects in order to analyse their contents in collaboration with specialisation coordinators have been organised. This has helped to: 1) reduce any existing overlap, 2) coordinate contents when necessary, and 3) consider the needs of more advanced specialised subjects. Specialisation coordinators have also performed coordination meetings among specialised subjects.

Mobility

FIB students can also take part in various mobility programmes. Each one is based on a number of agreements with other universities and institutions in different countries. All these agreements allow the student to make a stay in a foreign university and attend lectures, do the final project/thesis or accomplish a double degree. The school is constantly working to secure more agreements in order to offer students a wider range of destinations to choose from. We want to highlight evidence (at E.1.4.8) showing Mobility programs, Double degrees, Internships and other activities abroad.

UPC belongs to a network of European universities called CLUSTER. This participation implies the direct access of students from the UPC to the different universities belonging to the organisation. Additionally, UPC belongs to the network CINDA, mainly consisting of countries from Latin America, and to the Magalhães network, a consortium of universities in Europe, Latin America and the Caribbean created to promote and support the exchange between students in these areas.

FIB has established different agreements with universities or institutions from different countries, and is constantly working to secure more agreements. All these agreements allow the student to make a stay in a foreign university to go to lectures, do the final project/thesis or accomplish a double degree. Thanks to the agreements and the help of the coordinator of the master or the specialisation, the outgoing and incoming students know in advance which subjects they have to do. In case of a problem with the enrollment of any of the courses of the agreement arises, the coordinator analyses the curriculum of the target and source curriculum and suggests alternative subjects. Both universities should agree on the proposed alternative subjects.

The school, its teaching staff and its degree programmes are internationally recognised for their quality and for continuous innovation in the design of curricula and teaching methodologies. This spirit of excellence has placed the school at the forefront of delivering IT courses at university level. Thanks to its efforts, FIB has academic exchange and double degree agreements with 150 prestigious universities worldwide (see Partner universities map at E.1.4.8).

FIB has also incorporated an international and intercultural dimension into the purpose, function and delivery of its education. MEI, MIRI and MAI received AGAUR International Master's Programme mention for the academic years 2013/14 and 2014/15. This mention identifies master's programmes with an outstanding international dimension and professor qualification.

List of mobility programmes (see Mobility programs) availables for FIB students: Erasmus+, SICUE, América Latina, USA and Canada, UPC-Europa, UPC-China, Go for Europe, Vulcanus, Scholarships of National Institute of Informatics (NII) Tokyo, CERN, IAESTE, Balsells Scholarships, AREAS+.

Some of them have a double degree programme: École d'Ingénieurs ISIS (Informatique et Systèmes d'Information pour la Santé) and Centre universitaire Jean-François Champollion, Castres, França,

for GEI; École d'Ingénieurs ISIMA (Institut Supérieur d'Informatique, de Modélisation et de leurs Applications) and Université Blaise Pascal, Clermont-Ferrand, França, for MEI; Centro de Investigación en Computación and Instituto Politécnico Nacional de los Estados Unidos Mexicanos, México D.F., México, for MIRI.

The strong internationalisation of the school results in a high number of student exchanges. UPC indicators about the number of incoming and outgoing students at FIB are:

	Incoming	Outgoing
2017/18	148	72
2018/19	130	70
2019/20	121	56

Please note that the outgoing figure is highly dependent on the available public funding. During 2020, the pandemic situation has stopped almost everything, but the number of incoming students generally doubles the number of outgoing students.

Regarding mobility assessment, we have gathered information about MIRI and GEI. Both degrees have further mobility thanks to more consolidated mobility programmes due to proximity and research interests. In both cases, the mobility satisfaction is rated 4.7 and 4.8 for MIRI (evidence E.1.1.6) and GEI (evidence E.1.1.2) on a grading scale from 1 to 5, with 5 meaning "totally agree".

Improvement plans are proposed in this self-assessment-report to review double degree agreements within the UNITE consortium [270.M.510.2021] and to adapt to the new Erasmus+ programme [270.M.514.2021].

External practices

The framework for FIB student participation in educational activities related to university-business cooperation is called educational cooperation agreements (see Industrial Practices at evidence E.2.1.2). These kinds of activities are extracurricular for masters' degrees. As for GEI, they can be extracurricular or curricular. In the later case, it is mandatorily associated with the accomplishment of the final degree project in a company.

Through Educational Cooperation Agreements, the university gives companies the opportunity to take on students in their final years so that they are able to gain practical professional experience. They will not be subject to contractual employment obligations and they may be entitled to tax deductions.

Concerning GEI, the external curricular practices are mandatorily associated with the accomplishment of the Final degree project in a company, sharing with it the same training activities (project management module), supervision and assessment. The students can find as well the Educational Cooperation Agreement and the working plan documents at Information for Students (evidence E.2.1.2).

The analysis performed by the evaluation of the final master's thesis and the feedback of the employers show that the MECES level is achieved and that students are proficient in the competences taught in the master or GEI programme.

When referring to extracurricular external professional practices, which are not mandatorily associated with the final project, the agreements are previously reviewed to guarantee that they fit with the target degree. In this case, the tutor associated with the agreement is the vice-dean for International Relations for GEI, while for masters is the vice-dean for Postgraduates Studies.

Practices are positively evaluated in general in all the programmes as a mechanism to acquire other useful knowledge to their studies (*Satisfacció ESTUDIANTAT Pràctiques* on a grading scale from 1 to 5, with 5 meaning "totally agree", 3.5 at MIRI (evidence E.1.1.6), 3.8 at GEI (evidence E.1.1.2) and 4 for MAI (evidence E.1.1.8) and MEI (evidence E.1.1.4).

For the academic year 2019/20, the amount of external curricular practices was 10 (7 for MAI, 2 for MIRI, and 1 for MEI) and 177 for masters and GEI, respectively. This means about 26% and 46% of the total number of external practices, extracurricular and curriculars, performed during this year. On the other hand, a total of 19 labour experience recognition were done in 2019/2020 for the master students: 1 for MEI and 18 for MIRI. The high number of MIRI students with labour experience is thanks to the tight relation with the Barcelona Supercomputing Center and HP Inc. (evidence E.2.1.11, External Practices and Labour Experience folder, with restricted access), which works really well to create networking and research and industrial cooperations.

Improvement plans have been identified to use the new UPC applications to deal with the external practices [270.M.508.2021]. A new regulation for external practices is also planned, allowing external curricular practices not associated with the final degree project [270.M.522.2021].

Final degree project

Regarding the GEI bachelor's thesis (TFG in Catalan, evidence E.2.1.8), there exists an initial training module on project management (Thesis management course) which allows the student to precisely establish the goals and scope of their work, plan it and think about the technical competences that will be needed to carry it out. All this is done under the guidance of their project supervisor and with the help of the project management professors. The Final degree projects are related to the specialisation that the student has chosen and must cover some of the technical competences of that specialisation, in addition to the generic ones. Assessment of cross-disciplinary competences shall be done on the basis of the criteria listed in bachelor's thesis assessment rubrics, as well as start, follow-up and end indicators (evidence E.2.1.9).

For the master final project, the supervisor guides the students to develop a proposal of the final project (title, brief descriptions and objectives of the project) that achieves the competences and objectives of the master's degree. This proposal has to be carried out in one of the specialisations of the master in the case of MIRI, and with no specialisation for MEI and MAI. The final project proposal has to be done before the semester when the students enrol the final project. With regard to MIRI, the coordinator of the MIRI specialisation the student belongs to, who either is the expert or is able to check with other professors in the area, evaluates the master thesis proposal if it targets the competences of the specialisation. For MEI and MAI, it is done by the coordinator of the master, who is an expert in the field and has the vision of all the competences and subject curriculum. In the event that it is rejected, observations are indicated, and the supervisor and the student have to change the final project proposal to fit the requirements described as a result of the rejection. Once

the proposal is approved, the project supervisor has to guide the student along the semester to guarantee the completion of the final project by achieving the objectives indicated in the proposal.

On the other hand, students are also aimed to study the possibility of completing the Master thesis with a company agreement or a foreign university. In this case, a master thesis tutor is required to guarantee the competences and quality of the master thesis document.

Notwithstanding, it is the responsibility of the supervisor or tutor to validate the work done by the student before it can be evaluated by an evaluation committee. The supervisor or tutor are linked to an academic unit (department, research institute, etc.) with expertise and teaching in GEI or master degrees. The work will be carried out under the direction of a senior teacher. If the director of the final project is a novice teacher, another senior teacher will be required to act as the speaker of the work, ensuring its adequacy to the objectives of a final project of the studies. However, either a professor of the University Teaching Staff, of the Scales of Research Staff of the *Consejo Superior de Investigaciones Científicas*, or professors or researchers in higher education or research bodies, (both Spanish or foreign) may also lead a project. If so, it will be necessary for another senior teacher to act as the project tutor.

For both GEI and masters, the final project evaluation committee follows the regulations of each study with the objective of guaranteeing the proper evaluation of the final projects. Those evaluation committees (three professors - the supervisor is not a member) are automatically created by an application that takes into account a database of professors of the degree and the expertise of the professors in the area. After this automatic assignment of professors to the committee, the result is double checked by the specialisation coordinators and the coordinators of the masters. If necessary, a modification of the committee would be done.

Recognition of credits acquired externally by the students

Regulations allow recognition of subjects and credits for external practices and other activities.

The school has as a frame of reference the UPC degree and master's degree regulations (NAGRAMA - acronym in Catalan). The school, based on the NAGRAMA regulations for teaching centres and university research institutes, develops specific aspects of the studies of the university master's degrees that are taught within the Barcelona School of Informatics. The regulatory framework of the UPC is quite flexible and thanks to the specific regulations of each degree allows the adaptation of the general academic regulations (NAGRAMA) to the singularities of each centre and each degree.

The Barcelona School of Informatics is reviewing the regulations in order to adapt them to higher-ranking regulations as a result of the proposals for improvement that arise from the analysis of the processes to which it refers, in accordance with the objectives of the degree. The regulations are finally approved by the Standing Committee, which is made up of members of the management team, faculty, students, and administrative staff.

With regard to masters' degrees, new regulations have been added to include recognition of labour experience credits and curricular external practices related to the final master thesis. From 2018, when these new regulations were approved, there have been 52 students (16 curricular external practices and 36 labour experiences recognitions - evidence E.2.1.10). Some of those students have been able to continue their studies while they were working in the same competences and the same field of the master. Finally, in order to motivate students to finish their studies in a reasonable period of time, a normative of minimum academic progress that is flexible with those part-time students has been introduced.

NAGRAMA regulation also allows recognition of subjects. This is carried out by comparing topics previously completed by students with those of the GEI. A record of the approved recognitions is kept to maintain a uniform approach over time.

Students' study progress rates adequacy

In general, students at all levels have some type of tutorship and guidance. Special attention is given to students with other capacities and high performance athletes.

To guarantee studies are ended in an adequate period of time there are academic progress regulations for masters and a special first year regulation for GEI. On the other hand, special curricular evaluation can be done by the academic commissions to help the progress of the students and to avoid critical situations where students have a good overall performance in all the subjects except for some special cases.

In the following chapter Exams: System, Concept & Organisation, the above mentioned is commented and evidence is given.

GEI studies:

For students enrolled at FIB, a tutorial action plan has been devised (E.2.4.2), which includes three different programs: peer mentoring (*mentories*), peer academic mentoring (*aula lliure)*, both of them specially addressed to first year undergraduate students, and tutorship.
Additional actions are organised for degree students in order to give specific support and information about degree specialisations, final degree projects and mobility programs. Academic support services for master's students are also provided.

The dropping out rate at GEI has significantly decreased since the launch of these mentoring programs (26,6% in 14/15, 24,3% in 15/16, 19,7% in 16/17 and 21,7% in 17/18, on the first year; 46,8% in 15/16, 42,6% in 16/17, 42,1% in 17/18, 35,9% in 18/19 and 30,6% in 19/20, within the whole degree) (see evidence E.1.1.2). This outcome shows how relevant guidance programs are to improve student's success.

The GEI graduation rate (graduation in the expected time) in the last academic year 2019/20 is 35,8%, more than twice the graduation rate in 2014/15 (16.5%), and much higher than the minimum goal of 14%. Indeed, last year for which there is information about the initial phase (2018/2019) performance shows that more than 54% of students could finish this initial phase at the expected time, almost doubling 2014/15 performance.

This is partially thanks to the introduction and consolidation of the re-evaluation mechanism and other complementary plans (tutorial plan, revision of the planning and assessment method of some subjects) that the students' performance at the Initial Phase follows a growing trend. On the other hand, during the last few years there has been an increase in the admission cut-off mark, which has also helped to improve the performance. No correlations results are shown between the dropping out rate and the admission cut-off mark because there is no significant difference between the cut-off mark and the best grade.

Concerning the rest of the global academic indicators of the degree, the goals are being achieved. Specifically, the efficiency rate has remained over 94% in the last three years of graduates, whereas the goal was only set over 68%, increasing more than 6% the efficiency rate of the last review. We plan to enhance support strategies at GEI to increase the efficiency rate even more [270.M.516.2021].

Master's studies:

FIB Masters in the new EHEA framework started in 2012. In the case of MAI, each student master is assigned a tutor from the admission period that has the role of helping the MAI student with the enrolment and guidance during the master. As for MIRI and MEI, the coordinator of the master is in charge of tutoring the students, with the help of the specialisation coordinators for MIRI students.

MEI Studies:

Evidence E.1.1.4 shows academic results for MEI. A summary is set out as follows:

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MEI academic results	Egress rate (%)	91,4%	92,8%	92,9%	93,1%	94,2%
	Attainment rate (%)	86%	79,9%	79,9%	84,4%	86,3%
	Dropping out rate (%)	5,9%	40,9%	0%	20,8%	33.3%
	Graduated rate (%)	52,9%	40,9%	62,5%	62,5%	54,2%
	Efficiency rate (%)	87,8%	97,6%	87%	87,6%	88,9%

These global academic indicator rates are high enough (also global MEI qualifications shown in Criteria 3: Exams and Evaluations). In any case, we are working on increasing the graduation rate in several ways: facilitating students can work and study with better timetables (2 or 3 days a week), part-time following an industry pathway (external practices and TFM, modality B or D) and contacting students that either have just the final project or a small number of credits left. Regarding the dropping out rate, we have been carrying out actions to motivate and help students to end their studies. The deviation observed in the percentage of dropping out is due to the reduced number of enrolled students, which makes this number to significantly increase or decrease with few students who decide to give up the master. At all events, our improvement plan proposes new features and directions for the MEI programme since this programme fits with a national MEI regulation (evidence E.1.1.12).

MIRI Studies:

Evidence E.1.1.6 shows academic results for MIRI. A summary is set out as follows:

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MIRI academic results	Egress rate (%)	94,4%	94,4%	96,6%	97%	95%
	Attainment rate (%)	85,7%	87,6%	91,7%	92,4%	88,4%
	Dropping out rate (%)	19%	14%	29,5%	17,5%	10,4%
	Graduated rate (%)	64,3%	72,1%	52,5%	63,5%	70,2%
	Efficiency rate (%)	95,5%	97,9%	94,2%	96,7%	94,1%

These global academic indicator rates are high enough (also global MIRI qualifications shown in Criteria 3: Exams and Evaluations). With regard to MIRI, the dropping out rate is more stable and that is usually due to labour reasons when students decide to focus full time on their jobs. Additionally, we have noticed that some students enrol in MIRI because they are interested in some specific subjects to achieve the minimum number of ECTS credits to be able to start their PhD.

MAI Studies:

Evidence E.1.1.8 shows academic results for MAI. A summary is set out as follows:

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MAI academic results	Egress rate (%)	96,7%	97,9%	96,1%	98,7%	99,1%
	Attainment rate (%)	86,9%	91,9%	88,4%	95,1%	92%
	Dropping out rate (%)	0%	8,7%	11,9%	5,7%	18,4%
	Graduated rate (%)	87,5%	65,2%	76,2%	82,9%	71%
	Efficiency rate (%)	100%	95,9%	94,8%	94%	96,8%

These global academic indicator rates are high enough (also global MAI qualifications shown in Criteria 3: Exams and Evaluations). The dropping out rate in MAI has usually been a small one. Last year was especially high compared to the rest of the years. We believe that was due to some changes in the subjects, optional spots limitations, and mobility reasons, together with some unexpected and exceptional drops due to the pandemic situation. We are analysing this number at the same time that we are improving the coordination of the three universities and subjects contents.

Graduates' occupation rates adequacy

The number of graduates in the academic year 2019/20 was 223 (evidence E.1.1.2), as shown in the table below.

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
GEI graduates	Women	16	17	18	28	18
	Men	181	217	211	229	205
	Total	197	234	229	257	223

The most recent employment satisfaction survey is that of the 2020 edition (evidence E.2.1.12). It shows that the employment rate is 96.7% and the adequacy rate is 89%, which is 15% better than the last review (74.1%). In the same survey, the average of the assessment of the utility of theoretical education is 5.4 while for the utility of practical education is 5.2 (both in an assessment range of 1 to 7, where 7 is the best score).

The graduates association "FIB Alumni" and the companies in the ICT sector that we collaborate with provide us context information, which confirms a very high employment rate of our graduates and their excellent reputation in the ICT professional environment.

At evidence (E.2.1.1) we can see that graduates are mainly working three years after having completed their university studies, especially in the field of Engineering.

The number of MEI graduates in the academic year 2019/20 was 10 (evidence E.1.1.4), as shown in the table below.

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MEI graduates	Women	1	2	1	4	1
	Men	10	10	6	19	9
	Total	11	12	7	23	10

The most recent employment satisfaction survey is that of the 2020 edition (evidence E.2.1.13) in which the employment rate is 85.7% (100% after having finished the studies) and the adequacy rate is 85.7%.

In the same survey, the average of the assessment of the utility of theoretical education is 4.4 while for the utility of practical education is 4 (both in an assessment range of 1 to 7, where 7 is the best score). In 2020, the global evaluation done by the students of the subjects and academic staff was 3.5 and 4 (assessment range of 1 to 5), respectively (evidence E.1.1.4)). That means that actions still can be done in order to improve the student academic satisfaction once they reach the market. In this regard, we have been working towards the implementation of a MEI Dual Master programme

with a more professional orientation, which will be verified as part of a new improvement plan [270.M.517.2021].

The number of MIRI graduates in the academic year 2019/20 was 59 (evidence E.1.1.6), as shown in the table below.

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MIRI graduates	Women	3	6	5	13	8
	Men	33	31	30	43	51
	Total	36	37	35	56	59

The most recent employment satisfaction survey is that of the 2010 edition (evidence E.2.1.13) in which the employment rate is 88.9% (94.5% after having finished their studies) and the adequacy rate is 70.6%. In the same survey, the average of the assessment of the utility of theoretical education is 5.5 while for the utility of practical education is 5.3 (both in an assessment range of 1 to 7, where 7 is the best score). In 2020, the global evaluation of the subjects and academic staff done by the students was 3.5 and 4 (assessment range of 1 to 5), respectively (evidence E.1.1.6). Thus, as the students are specialised in a field the overall satisfaction is better than that for MEI students. That makes us think about possible orientations of MEI studies following the computer curricular of the ACM.

The number of MAI graduates in the academic year 2019/20 was 37 (evidence E.1.1.8), as shown in the table below.

		2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
MA graduates	Women	-	4	5	5	8
	Men	13	25	29	19	29
	Total	13	29	34	24	37

The most recent employment satisfaction survey is that of the 2020 edition (evidence E.2.1.13) in which the employment rate is 81.8% (100% after having finished their studies) and the adequacy rate is 81.8%. In the same survey, the average of the assessment of the utility of theoretical education is 4.8 while for the utility of practical education is 4.7 (both in an assessment range of 1 to 7, where 7 is the best score). In 2020, the global evaluation of the subjects and academic staff done by the students was 3.5 and 4 (assessment range of 1 to 5), respectively (evidence E.1.1.8).

Assessment of the training received

In the same year 2020, the global evaluation of the subjects and academic staff done by students was 3.5 and 4 (assessment range of 1 to 5), respectively. For graduated GEI students, the assessment of the level of training received shows a global satisfaction of 5.4 and 5.2 for the theoretical and practical part, respectively (on a grading scale from 1 to 7, where 7 means "totally agree", D1 and D2 sections, evidence GEI-Graduated). On the other hand, at *Indicadors de satisfacció* on evidence E.1.1.2 (on a grading scale from 1 to 5, where 5 means "totally agree") the results show a high score for subjects global satisfaction (3.5) and professor teaching (3.9), being the employment ratio more than 98% at the moment of the survey, and to the best of our knowledge, all of them having a job.

Concerning MEI students, the assessment of the level of training received in the master's degree for those graduated students shows a global satisfaction of 4.4 for the theoretical part and 4 for the practical part (on a grading scale from 1 to 7, where 7 means "totally agree") (H1 section, evidence E.2.1.13). However, this evaluation significantly increases if we look at the teamwork evaluation and decision making, raising up to 5.4 and 5.1, respectively. On the other hand, at *Indicadors de satisfacció* on evidence E.1.1.4 (on a grading scale from 1 to 5, where 5 means "totally agree") the results show a good score for subjects global satisfaction (3.4) and professor teaching (3.8).

Regarding MIRI students, the assessment of the level of training received in the master's degree for those graduated students shows a global satisfaction of 5.5 for the theoretical part and 5.3 for the practical part (on a grading scale from 1 to 7, where 7 means "totally agree") (H1 section, evidence E.2.1.13). The evaluation of capacity building in documentation and identification of sources and resources as well as speaking and writing skills scores are 5.6 and 5.2, respectively. On the other hand, at *Indicadors de satisfacció* on evidence E.1.1.6 (on a grading scale from 1 to 5, where 5 means "totally agree") the results show a high score for subjects global satisfaction (3.5) and professor teaching (3.9).

With respect to MAI students, the assessment of the level of training received in the master's degree for those graduated student shows a global satisfaction of 4.8 for the theoretical part and 4.7 for the practical part (on a grading scale from 1 to 7, where 7 means "totally agree") (H1 section, evidence E.2.1.13). On the other hand, at *Indicadors de satisfacció* on evidence E.6.1.7 (on a grading scale from 1 to 5, where 5 means "totally agree") the results show a high score for subjects global satisfaction (3.5) and professor teaching (4).

At all events, as can be seen at H2 section all master's students evaluate positively the decision-making training developed (evidence E.2.1.13, page 75, with a grade of 5.6 or more on a grading scale from 1 to 7, where 7 means "totally agree"). This is an important aspect since master students may decide either to continue with PhD studies or to become an important part of an organisation, thereby contributing with their ideas and decisions.

Pandemic-related adaptation of degree programmes (COVID-19 actions)

In general, subjects have not changed contents at all or very little modifications have been introduced. Nevertheless, they have adapted their lectures to the pace of students doing in some cases individual monitoring (as detailed in the special and temporal addendum of teaching guides).

On the other hand, after the lockdown period when all lectures were online all timetables of GEI and masters have been adapted to a different style consistent with the new circumstances. There have been days of just theoretical lectures, days of laboratory and problems lectures, and days of essential laboratories (when online mode was compulsory except for essential lectures that require lab material). This split of the timetables has been carried out to reduce the mobility of the students and try to guarantee that they have only-online or only-face-to-face days, based on the pandemic situation at all times. These changes in the timetable have not had an impact on the structure of the subjects since there has been a tight coordination between departments, professors and FIB managements.

Two implementation plans have been proposed to profit from lessons learnt during the COVID-19 period reviewing FIB strategy for online/blended/hybrid learning [270.M.512.2021] and FIB BYOD strategy [270.M.513.2021].

Criterion 2.2 Work load and credits

The teaching methodology, the contents and each of the activities done in each subject is public and reviewed each semester. The activities have to be defined by the responsible lecturers indicating the face-to-face classes dedicated (laboratory, theory and/or problems), the number of hours estimated of autonomous learning and guided activities per week. This estimates the total number of hours dedicated by students. The academic commissions review this activity so that the number of hours is adequate to the number of ECTS of the subject.

On the other hand, each semester FIB aims undergraduate students to fill a survey about the number of hours dedicated to a subject, correlating this information with the final grade of the students in the subject. This statistics is a feedback for the lectures that helps to detect any anomalous situation with regard to the activities. The figure below shows an example for a subject that is a compulsory one: 10 students participate in the survey on a voluntary basis. In this Figure, the guide indicates the number of hours that the responsible estimated for the different activities (Theory-T, Problems-P, Laboratory-L, Autonomous learning-AA, Guided activities-AD). In this case, the estimated number of hours was really close to the number of hours dedicated by the students. Although this tool is really useful, the student participation is not high. Therefore, an improvement action should be planned to reach a much higher participation of the undergraduate students, as asking master students to fill it as well.
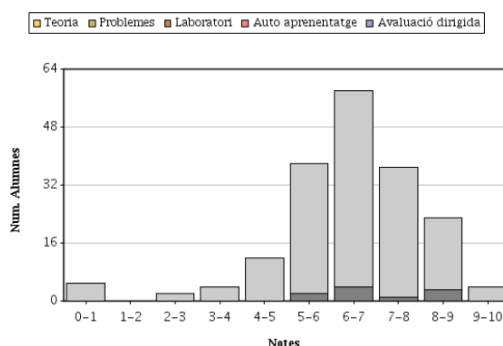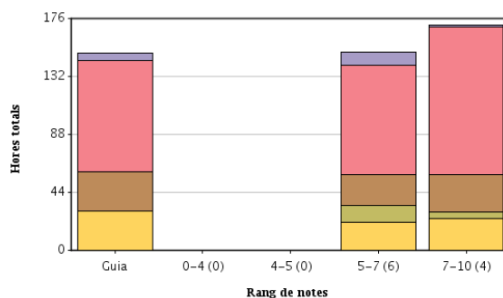
Furthermore, coordinators have a tool to measure the overall estimated workload that students have based on the enrolled subjects. This tool is able to show the amount of dedicated hours among the weeks of the semester per subject and the sum of all the subjects' workloads. The figure below shows an example for two individual subjects of MEI. On the left, the subject workload is shown. On the right, the sum of both of them is displayed. Each figure shows the amount of work for each individual week from 1 to 14, when students have face-to-face classes and lectures, and as a global amount of work for a set of weeks, 15-18, when there are no face-to-face classes and only AA and AD activities occur.
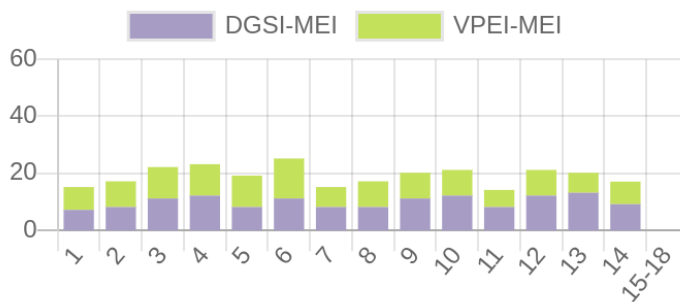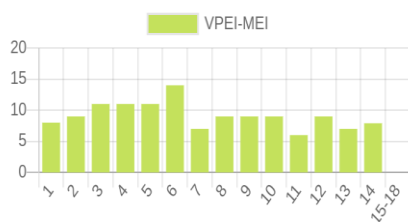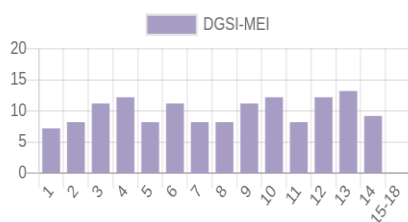
With regard to the external practices, students who sign an educational cooperation agreement are subject to a maximum of 900 hours of internship in the same academic year. On the other hand, based on their studies the total number of hours during the entire programme is:

- GEI: maximum of 1,800 hours
- Master of 90 ECTS: maximum of 900 hours
- Master of 120 ECTS: maximum of 1,200 hours

For GEI students, to participate in an agreement it is indispensable to have passed at least half of the credits on the course they are studying. As for master students, they can start from the beginning of the master (from the last regulation review of external practices at UPC -2020). The agreement and the evaluation of those agreements together with the final project guarantee that the amount of work done fits the regulations requirements.

Criterion 2.3 Teaching methodology

The overall analysis of GEI and master studies reveals that all those subjects with a really practical and research oriented approach have better satisfaction grades. Notwithstanding, the number of students enrolled in the subject and the academic year of the curriculum also contribute to be more or less motivated, which is usually a reason for the level of satisfaction although the overall evaluation is high.

Following we detail the teaching methodology and evaluation method of a set of subjects of the GEI and master's degrees.

GEI studies

The evaluation method of all the degree subjects is public in the teaching guide and accessible through GEI website (E.2.1.7).

The teaching methodology and activities of each subject are described in detail in the teaching guide (Curriculum/Syllabus at evidence E.2.1.7) and they are reviewed each semester by the CAGEI.

In the case of the Final degree project, the assessment is divided into three stages (initial, intermediate and final) where different actors participate (professor of the project management course, project supervisor and final evaluation committee). Both the technical and the generic competences are assessed, the latter by means of evaluation forms at the three stages, with a weighting of 60% and 40%, respectively. All the information about the Final degree project and its evaluation is public and accessible (evidence E.2.1.8).

GEI Degree final projects during the academic year 2019/20 were approximately 215 (based on evidence E.1.1.2).

Materials involved in the 2019-2020 and 2020-2021 evaluations of some students have been collected for some selected subjects of the curriculum (evidence E.2.1.11, GEI subfolder of Proof of Executions folder, with restricted access):

- M1: **Mathematics I** (compulsory course in the initial phase, 1st year, 2nd semester). Subject Webpage following previous link or the subject acronym.

This course further develops the concepts of reasoning that are introduced in the Mathematical Foundations course; this is done through the study of two subjects with which every computing engineer must be familiar: graph theory and linear algebra.

Teaching methodology:

In the theory classes, the teacher explains the subject accompanying it with some examples and solving problems of the list.

During the practical classes, students solve problems under the supervision of the teacher. Some of those problems must be prepared prior to the class. There are also several activities in the laboratories in order to practice all the concepts worked at theoretical classes.

Evaluation methodology:

Subject tries to be very practical with several lab sessions that help with the learning process of the students. Practical sessions are graded. Continuous assessment is done although the student can have a final exam to increase the final grade or pass the subject.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction at 2019/20-Q1 is 3.65 (on a grading scale from 1 to 5, where 5 means "totally agree evidence E.2.1.11, Subjects Surveys folder, with restricted access) for both objectives and planned activities, which is a good grade considering that this is the first academic year for most of the students and there is a huge number of students enrolled.

-PRO2: **Programming II** (compulsory course in the initial phase, 1st year, 2nd semester). Subject Webpage following previous link or the subject acronym.

In this course, modular design and object-oriented design are introduced, using C++ programming language. New data structures are presented, both linear (stacks, queues, lists) and hierarchical (binary, n-ary and general trees); iterative design and recursive design are studied in depth, emphasising the importance of reasoning about the correctness of a given design as well as the detection and improvement of inefficient solutions. Finally, implementations of linear and tree data structures are presented, using recursive data types.

Teaching methodology:

Topics are explained in a practical way by using many examples. Theory classes (two-hour session) introduce knowledge, techniques and concepts that are used in laboratory sessions (three-hour session). Presentation and discussion of the solutions of a set of problems are included.

Evaluation methodology:

A programming project is used to integrate knowledge and skills of the entire course, except for the topic (recursive data types) that is assessed in a theory exam. Practicals and two partial exams help to develop a continuous assessment.

Student satisfaction about objectives and planned activities:

Regarding the objectives, student satisfaction has been 3.48, 3.04, 3.37, and 2.76 in 2017/19-Q2, 2018/19-Q1, 2018/19-Q2 and 2019/20-Q1, respectively (evidence E.2.1.11, Subjects Surveys folder, with restricted access), respectively, being Semester 1 2019/20 the last one surveyed before the pandemic situation. On the other hand, student satisfaction concerning planned activities for the same academic years was 3.47, 3.09, 3.28 and 2.47, respectively. We are evaluating the low grades and working with the professor to address this situation.

- SO: **Operating Systems** (compulsory course, 2nd year, 3rd semester). Subject Webpage

The course provides an overview of the OS from three perspectives: services offered by the system to users/programmes and their utilisation, major internal design elements of a kernel (data structures and algorithms) and it eventually relates these two components to understand how it affects performance of a system implementing programs concurrently (or in parallel, depending on the architecture). The course focuses on the context of an OS kernel (within node), not entering network issues.

Teaching methodology:

The course has two types of classes: theory and laboratories. The theory classes are mainly oriented to generic content or to explain concepts applied to the particular case of Linux, that is, they are mainly practical. The laboratory classes are weekly and include work performed prior to the student: class exercises to be done individually and some questions that must be delivered at the end of the class.

Evaluation methodology:

Attendance to at least 80% of the laboratory sessions is a necessary condition to pass the continuous assessment of the course. Although all the sessions include those questions to deliver, not all of them are evaluated, but only those that are marked as such. The rest are used to track students and monitor the implementation of previous work as well as the attitude of students in class. Especially in laboratory classes, issues such as student punctuality and positive attitude to the subject are assessed

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction in 2019/20-Q1 is 3.89 and 3.66 (evidence E.2.1.11, Subjects Surveys folder, with restricted access), respectively, for both objectives and planned activities which reflects the good organisation of the course.

- EEE: **Business and Economic Environment** (compulsory course, 2nd year, 4th semester) Subject Webpage

Teaching methodology:

There are two parts: economics and business. Economic Part: study the socioeconomic environment of the activity of the company through sessions that simulate a mini-course about how to be a good minister of economy and provide tools to understand the economy of a country. Business Part: description of what is a company, its relationships with the environment, the role of the employer, the type of company, etc. The main processes and activities carried out in each department are studied as if it were a documentary series called "What is the business?"

Evaluation methodology:

It consists of a mix of lectures, reading various documents, preparation of some "Continuous Assessment Practices" (PECs) and debate sessions, where the topics studied until that day are discussed and assessed.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction, for 2019/20-Q1, is even higher than in the previous subject: 3.80 and 4.11 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. The activities performed in the subject are up to date real situations that students appreciate to deal with.

- IA: **Artificial Intelligence** (compulsory specialisation in Computing). Subject Webpage

In this course, we aim to give an overview of artificial intelligence, introducing the types of problems that can be solved, its theoretical foundations, the basic techniques and how to apply them. The approach of the course is to balance theory and practical activities.

Teaching methodology:

The classroom sessions are divided into theory, problems and laboratory sessions. Theory sessions introduce the knowledge of the course concepts, switching between the exhibition of new material with examples and discussion with students on concepts and examples. Problem sessions deepen the knowledge on techniques and algorithms explained in the theory sessions. They encourage students to participate and discuss possible alternatives. Laboratory sessions develop small practical assignments by using AI tools and languages in order to practice and enhance the students' knowledge on concepts, techniques and algorithms.

An innovation assignment will come from a group work where examples on business innovation related to the use of Artificial Intelligence techniques should be found and analysed. The work is presented and discussed in the classroom.

Evaluation methodology:

The student assessment consists of a partial exam mark, a final exam mark, a mark for the Innovation assignment and a laboratory mark. The laboratory mark comes from the practical assignments' reports.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is really high: 4.14 and 3.62 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. AI is a hot topic field and it motivates students. The innovation assignment may also be one of the reasons for these results.

- DSBM: **Design of Microcomputer-Based Systems** (compulsory specialisation in Computer Engineering). Subject Webpage

The main goal of the subject is to acquire the necessary knowledge to design and implement embedded systems both in their hardware (design of input/output interfaces, design of microcontroller supervision systems, connection of advanced peripherals, hardware design with

immunity to noise, etc.) and software aspect (programming with scarce resources, hardware conscious programming, real time from interruptions, concurrency of real-time tasks, communications with advanced peripherals, etc.).

Teaching methodology:

Classes of theory and problems complement each other since lectures are reinforced with examples showing the possible alternatives and solutions to common problems. Some topics are proposed for self-assessment exercises so that students can be aware of their progress and may ask for teacher support in case any deficiency is noticed. The practical sessions take place in situ in the laboratory-teaching department at FIB. There are two practicals that require large cumulative work of students in the preparation of a project.

Evaluation methodology:

The grade for this course is obtained from the weighted average of the marks of theory, laboratory practicals and the final work. The laboratory mark is acquired while doing practical work in the lab, with at least two partial deliveries of the practicals.

In addition, students must deliver a design of an embedded system based on a real problem. This work has to be presented at the end of the course and contributes to the mark. The documents for this design are written in English. The quality of the design, the selection of components and clearness of the presentation will be evaluated.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.63 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for both objectives and planned activities. A good planning of the activities with a really practical approach seems to be part of the success when it comes to student satisfaction.

-PES: **Software Engineering Project** (compulsory specialisation in Software Engineering) Subject webpage

A project is the most common activity of engineering in its professional development and even many companies organise all their engineering work around projects. Informatics engineering is not immune to this trend, but is clearly present. Within the specialisation of software engineering, the course is designed to reproduce, as far as possible, the project development of a software system as if it were a professional environment. For instance, there is a project team with different roles, and every aspect of project management is taken into account: planning, cost, schedule, deliverables, meeting minutes, oral presentations, etc. Therefore, it is a completely practical course. Moreover, necessary techniques have already been acquired in previous courses that in PES will be implemented during the execution of a project on a case to be presented.

Teaching methodology:

It is a project-based course, and therefore essentially practical. The classes always take place in a classroom laboratory with an expected number of 3 to 5 project teams per classroom. The project teams are composed of 5 to 7 students, in order to allow the implementation of a non-trivial prototype.

The explanations of concepts needed (most at the first two weeks, but also at any time when necessary) are found in the same classroom. The teacher in the classroom acts as tutor of the teams.

The project starts from a general idea and tries to reproduce a real project with all its elements (deadlines, deliverables, project management, etc.). The methodology used is agile, organised as an initial inception phase and then 4 development iterations.

Evaluation methodology:

In a project's course, what needs to be qualified is the realisation of the project itself. The project is developed as a teamwork, but also the team members have been assigned different tasks which demand to be evaluated individually.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 3.96 and 4.0 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. This subject is also practical and includes teamwork, which seems to be part of the good results it obtains.

-ER: **Requirements Engineering** (compulsory specialisation in Information Systems) Subject webpage

Teaching methodology:

The teaching method of the course is that of the PBL family (Project Based Learning) and the centrepiece is a project (that changes every year) by which students, working in groups, have to meet the complete engineering requirements.

Evaluation methodology:

Part of the evaluation is done based on the evaluation of the first assignment of the groups, but also several course exercises are required. Each student submits (via a moodle platform) their own answer to the exercises within the specified deadline. The completion of the exercise requires learning new skills. Feedback is quickly done so that they will be able to discuss it in class.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.24 and 4.22 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. Both teamwork and practical approach are key on those good results.

-PI: **Internet Protocols** (compulsory specialisation in Information Technologies). Subject webpage

Teaching methodology:

The course consists of lectures combined with exercises where students learn the theoretical foundations of the subject. A challenge is proposed at the beginning of the course. Students should seek information and defend the chosen topic, presenting the relevant technological aspect, systems integration, adaptability and other aspects. The presentation must involve 3 of the students of the group.

During laboratories, students solve a modular network. Every 2 students design and program a part of the network so that in the end all modules are to form a whole that works. Students are encouraged to work on one side in teams of 2 to solve their module as well as to coordinate with the other modules

to work on everything. Each lab covers an aspect of the topics discussed in class. The understanding of the theory (works responsibilities) is essential for the lab work.

Evaluation methodology:

Evaluation and teaching methodology helps the learning process of the students. Moreover, although laboratories and exercises are not the main part of the course evaluation they seem to be very well assessed.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 3.78 and 3.91 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. Once more, the practical approach is something that students appreciate, resulting in a high satisfaction outcome.

Furthermore, we have also collected evidence of the materials involved in the evaluation of the subjects and Final degree project (TFG, in Catalan) (evidence E.2.1.11, TFE subfolder of Proof of Executions folder, with restricted access).

MEI studies

The evaluation method of all the degree subjects is public in the teaching guide and accessible through the FIB web pages http://www.fib.upc.edu/en/masters/mei/assignatures.html.

Materials involved in 2018/19-Q2 and 2019/2020-Q1 evaluation of some students have been collected for some selected subjects of the MEI curriculum (evidence E.2.1.11, MEI subfolder of Proof of Executions folder, with restricted access):

- VPEI-MEI: **Viability of Innovative Business Projects** (compulsory subject) Subject website following previous link or the subject acronym.

The course aims to promote the entrepreneurial spirit of the participants while establishing the process for developing a business plan that goes around an innovative business idea.

Teaching methodology:

The process of developing the business plan is carried out around one or more ideas within three main innovation concepts. The three axes for the development of an innovative business idea around which the matter evolves are the identification of long-term market trends as a source of innovation, technology benchmarking as an innovative inspiration, and ethical business model as the core of innovative thinking.

Case studies form a fundamental part of the course. In some cases, theory lectures include short lectures of entrepreneurs or managers to provide real guidance on how they addressed the main issue discussed during the session.

Regarding project sessions, they focus on enabling students to progress in building their business plan. The methodologies used range from group dynamics and brainstorming to online market research, preparation of specific parts of the business plan or cross-presentation between group members. Project development sessions are carefully scheduled and designed to facilitate the implementation of business plans.

Evaluation methodology:

The assessment is based on student presentations and the defence of the business plan in front of a jury comprising course faculty members and - optionally - another member of the teaching staff or a professional guest.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2018/19-Q2 is 4.25 and 3.67 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively, since the pandemic situation made it impossible to carry out the survey during the first semester. In addition, the evaluation of the contents of the subject is 4.0. The practical way of lecturing, with external actors explaining their experience, seems to be highly appreciated by the students.

- ISDCM-MEI: **Internet, Security and Multimedia Contents Distribution** (compulsory subject)

Teaching methodology:

This course gives an overview and the most technically and practically possible outlook of the problems and solutions to the development of Internet secure multimedia applications. The subject is organised from a practical point of view with many use cases and laboratory practicals.

For that reason, examples and problems are used to introduce the concepts to help students to attain the skills needed. Additionally, students are encouraged to interact and discuss possible solutions.

Laboratory practicals are built to complement theory and problem classes and have an integrative perspective (project type) since students implement small modules to be integrated in a final practical.

Evaluation methodology:

There are 2 mid-semester examinations, along with several daily "mini-tests" to guarantee continuous assessment, a long assignment that includes presentation, discussion and documentation, and several laboratory exercises. Taking a final exam is also possible when required by the student.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2018/19-Q2 is 3.79 and 3.21 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively, since the pandemic situation made it impossible to carry out the survey during the first semester. The evaluation grade is similar to the average although it would be interesting to try to analyse why this course does not obtain a higher evaluation as other subjects despite being mainly practical.

MEI Degree final project during academic years 2018/19 and 2019/20 academic years were approximately 23 and 10, respectively (number of graduated students, evidence E.1.1.4). Furthermore, we have also collected evaluation examples of the final master project (TFM, in Catalan) (evidence E.2.1.11, TFE subfolder of Proof of Executions folder, with restricted access).

MIRI studies

The evaluation method of all the degree subjects is public in the teaching guide and accessible through the FIB web pages:

http://www.fib.upc.edu/en/masters/miri/syllabus.html

Materials involved in the evaluation of some students (mostly of the academic year 2019-2020) have been collected for some selected subjects of the MIRI curriculum (evidence E.2.1.11, MIRI subfolder of Proof of Executions folder, with restricted access):

- CPDS-MIRI: **Concurrence, Parallelism and Distributed Systems** (compulsory). Subject webpage following the subject acronym link.

Teaching methodology:

The course presents the models, challenges, algorithms and systems focusing on three main aspects/modules: concurrency (multiple computations interacting with each other), parallelism (multiple cores or processors), and distribution (multiple computers across a network).

Following a set of introductory sessions, the course has three modules: concurrency, parallelism and distribution. The student has to select two of the three modules. The lectures are complemented with programming exercises to illustrate the problems and evaluate the solutions.

During the course, there will be two types of activities:

a) Activities focused on the acquisition of theoretical knowledge.

b) Activities focused on the acquisition of knowledge through experimentation by empirically implementing and evaluating in the laboratory the mechanisms explained at a theoretical level.

The theoretical activities include participatory lecture classes, which explain the basic contents of the course. The practical activities include seminar laboratories where students implement the mechanisms described in the lectures. The seminars require a preparation that means reading the statement and supporting documentation as well as a further elaboration of the conclusions in a report.

Evaluation methodology:

The final grade is calculated from the grades of the two modules taken by the student, even though the students must take into account all the marks.

For each module, there is an exam and a lab grade. The exam comprises problems on the theory taught. The lab grade reflects the work done by the students in the practical assignments.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.08 and 3.81 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. This subject is mainly practical in any of its three modules and their material has been updated to the interest of the students.

-SMDE-MIRI: **Statistical Modelling and Design of Experiments** (compulsory):

Teaching methodology:

The aim of the course is to provide students with the tools needed to cope with complex systems using statistical modelling techniques. The students also learn different techniques of experimental design. The course is practical and encourages students to be able to solve real problems similar to those developed in class from the work done during the sessions once the course is completed.

Evaluation methodology:

There are different exercises that the students must solve throughout the course, in addition to a small final exam without a significant weight in the final grade.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.03 and 4.10 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. The mechanism used in this subject is mainly practical, with an overall interest of the contents of more than 4.0. This subject has gradually adapted their contents to the specialisation and students interests.

-CPS-MIRI: **Combinatorial Problem Solving** (compulsory specialisation in Advanced Computing):

A combinatorial problem consists in, given a finite collection of objects and a set of constraints, finding an object of the collection that satisfies all constraints (and possibly that optimises some objective function). Combinatorial problems are ubiquitous and have an enormous practical importance. In this course, we will study three different general paradigms for solving combinatorial problems: linear programming, propositional satisfiability and constraint programming. For each of them, we will study the algorithmic foundations as well as modelling techniques.

Teaching methodology:

The main feature of the teaching methodology is the use of materials accessible through the web, specifically designed for a self-learning course. These materials allow reformulating teaching in such a way that the traditional model of classes largely disappears.

Thus:

1. It regards the class as a baseline for work, which the student must continue and deepen on their own.

2. It builds upon high quality materials (slides, lists of problems, solved problems, examples of laboratory practical work, LP/SAT/CP software, and bibliographic references).

3. It aims to motivate students with examples, discussions, comments, etc. The insights behind the definitions, properties and techniques are discussed as a group.

The laboratory encourages students to work independently. The role of the teacher will be primarily to assist and evaluate the students, who should work mostly autonomously.

Evaluation methodology:

A part of the grade is obtained by means of a written exam at the end of the course while the rest is obtained by carrying out three successive projects (one for CP, the other for LP, and another one for SAT) that students have to submit.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2018/19-Q2 is 4.75 and 4.75 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively, since the pandemic situation made it impossible to carry out the survey during the first semester. The teaching methodology applied and the practical approach results in a very high satisfactory level. A possible reason for that is the significant interest in the contents of the subject that is also of the 4.75 over 5 observed in the satisfaction survey.

- GTCG-MIRI: **Geometric Tools for Computer Graphics** (compulsory specialisation in Computer Graphics and Virtual Reality):

This course has been designed to provide students with the geometric tools most ubiquitously used in computer graphics. Those include the mathematical description of geometric objects, rudiments of differential geometry for curves and surfaces, computation of intersections, affine transforms and projections, and some basic geometric algorithms.

Teaching methodology:

The teaching methodology consists of theory, problems solving, and laboratory classes. Theory classes are aimed at presenting and discussing the geometric techniques included in the syllabus. These classes are mainly conducted by the instructor. Problems solving and laboratory classes are aimed at consolidating the knowledge acquired and its specific application. In these classes, students will present, discuss (problems) and implement (laboratory) their solutions to problems that were posed in advance.

Evaluation methodology:

Throughout the course, some problems solving and implementing are assigned to the students. That homework is presented in class by the students and revised by the instructor, giving as a result the homework component of the final grade. There is also a final written exam, mainly devoted to problem solving, which gives the exam constituent of the final grade.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.42 and 4.42 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. Once more, a practical together with a continuous learning approach helps to the interest and satisfaction of the students.

- CNANM-MIRI: **Computer Network Architectures and Network Management** (compulsory specialisation in Computer Networks and Distributed Systems):

Teaching methodology:

Theoretical sessions are complemented by discussion sessions based on assigned readings. Studying some selected research papers will provide the flavour of research work.

Evaluation methodology:

Assignments, discussion and active participation are a significant part of the final grade.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.25 and 4.50 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. Discussion sessions and research approach seem to be part of the interest and satisfaction of the students.

-DW-MIRI: **Data Warehousing** (compulsory specialisation in Data Science):

Teaching methodology:

The course comprises theory and lab sessions.

Theory: the theory lectures comprise teacher's explanations and problem solving. The students are required to read and prepare some contents outside the classroom.

Laboratory: the lab sessions are mainly devoted to the practice (with and without computer) of the concepts introduced in the theory lectures by means of exercises that are done during class time. Some tools are used for the design and practice on a specific DBMS or tool (e.g., Oracle). There are three deliverable projects that are done outside the class.

Evaluation methodology:

The evaluation is principally based on the theory problems and laboratory assignments, in addition to a final exam.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 3.46 and 3.79 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. The amount of students of this course and the level of requirements of the laboratory results in students having a lower satisfaction of the activities than in other practical subjects, even though it is still good.

-OS-MIRI: **Operating Systems** (compulsory specialisation (High Performance Computing):

The focus of this course is twofold. On the one hand, students are provided with a detailed understanding of some basic mechanisms such as memory management that will help them understand the support offered by the hardware to the operating system (that is described in hardware-architecture courses). On the other hand, the students see how operating systems manage the resources in a High Performance computing system (HPC). This part includes job management, storage, power efficiency, and virtualisation, among others.

Teaching methodology:

This course is based on three kinds of activities: the activities where the professor describes some theoretical concepts in the class, self-learning activities where students learn about some specific systems on their own by reading papers/documents selected by the professor while applying the acquired knowledge in the laboratory, and finally group discussions activities.

Evaluation methodology:

The evaluation of this course consists of a final exam, practical assignments and questionnaires about the self-learning activities.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.14 and 3.57 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. This course has a really practical approach where real situations are proposed and groups of students work together to solve them.

MIRI Degree final projects during the academic year 2019/20 were approximately 59 (evidence E.1.1.6). Furthermore, we have also collected evaluation examples of the final master project (TFM, in Catalan) (evidence E.2.1.11, TFE subfolder of Proof of Executions folder, with restricted access).

MAI studies

The evaluation method of all the degree subjects is public in the teaching guide and accessible through the FIB web pages http://www.fib.upc.edu/en/masters/mai/syllabus.html.

Materials involved in the last evaluation of some students (academic year 2019/2020) have been collected for some selected subjects of the MAI curriculum (evidence E.2.1.11 in restricted access):

- CI-MAI (UPC): **Computational Intelligence** (compulsory subject). Subject webpage following the subject acronym link.

The aim of this course is to provide the students with the knowledge and skills required to design and implement effective and efficient Computational Intelligence solutions to problems for which a direct solution is impractical or unknown. Specifically, students acquire the basic concepts of fuzzy, evolutionary and neural computation. The students also apply this knowledge to solve some real case studies.

Teaching methodology:

The topics exposed in the lectures are extremely well motivated (why is this important?), stimulating (why is this relevant nowadays?) and supplemented with many real examples. These lectures introduce all the knowledge, techniques, concepts and results necessary to achieve a solid understanding of the fundamental concepts and techniques.

These concepts are reflected in the practical work that must be delivered at the end of the course. There are three laboratory sessions to reinforce the theoretical concepts introduced in the lectures as well as to prepare for the practical work. This practical work requires the student to pick a real

problem that collects and integrates the knowledge and skills of the course. There is also a written test of essential knowledge of the subject. In addition, there are small practical exercises after each laboratory class.

Evaluation methodology:

The course evaluation consists of several small lab assignments and a long assignment that contribute significantly to the final grade as well as a theoretical-practice exam.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 3.89 and 3.88 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. Although these indicators do not reach 4.0, the contents of the subject were evaluated with 4.33, which is a high score.

- CV-MAI (UB): **Computational Vision** (compulsory subject)

This course introduces the main aspects of computational vision, from fundamentals on image formation and basic image operations until object recognition, going through the main problems of computer vision: segmentation, keypoint extraction, pattern recognition and face recognition. The traditional and the latest state-of-the-art methods will be revised for the computer vision problems and methods will be used to solve some of these problems.

Teaching methodology:

The course is divided into a series of theory and practical sessions:

- Participatory theory sessions in which new concepts are introduced and discussed among students. Group discussion is strongly encouraged. Textbook chapters and research papers are provided to facilitate debate and exchange of ideas.

- Practical sessions are devoted to solving problems, designing methods and developing prototypes. These sessions allow students to put into practice previously introduced concepts to gain further insight.

Evaluation methodology:

Students are assessed based on their work in practical tasks (delivery of practicals in groups of 2 students) and a final theory exam. The weighting of the final mark will be proportional to the respective workloads of the practical tasks and the final theory exam.

Student satisfaction about objectives and planned activities of the subject:

The student satisfaction for 2019/20-Q1 is 4.18 and 4.30 (evidence E.2.1.11, Subjects Surveys folder, with restricted access) for objectives and planned activities, respectively. The research and practical approach contributes to the high satisfaction of the students.

MAI Degree final projects during the academic year 2019/20 were approximately 37 (evidence E.1.1.8). Furthermore, we have also collected evaluation examples of the final master project (TFM, in Catalan) (evidence E.2.1.11, TFE subfolder of Proof of Executions folder, with restricted access).

Familiarising the students with independent academic research and writing as a vital role in the programme

For all the programmes, every student has a good opportunity to create networking and work with professors that are both lecturers and researchers, or even part of a company. Therefore, all of them have many opportunities to know how independent academic research works. By way of examples, we would comment on some of the subjects where those chances are explicitly addressed.

GEI students have the chance to attend PAE, which is a subject where a multi-disciplinary project is developed taking as the basis a challenge defined by a company. This gives the opportunity to create networking as well as to know independent academic work, sometimes being related to research. On the other hand, all GEI students have a compulsory work done under GEP (in Catalan) to develop their projects. They are guided in the task of planning, research and writing their technical projects.

In the case of MEI students, all subjects at Direction and Management Module (Strategic Planning and IT Governance, Viability of Innovative Business Projects, Incorporating The Know-How Into The Decision Process, Financing for Innovative Business Projects, EFQM and Quality Management and Sustainability, Economy and Social Commitment) provide good opportunities to develop research, speaking and writing skills.

As for MIRI students, most of the subjects are state-of-the-art concerning research and usually students end performing a research related TFM. Indeed, SIRI and TMIRI are two compulsory MIRI completely training-oriented subjects by means of seminars aimed at research (workshops, conferences, hands-on tutorials, state-of-the-art reports, etc.) about the different specialisations and the introduction to Techniques and Methodology of Innovation and Research in Informatics. On the other hand, there is a general elective subject, I2P, whose goal is to experience innovation first-hand. Students work in a mixed team of Engineers (UPC) and Business Students (ESADE) to tackle real-life innovation challenges launched by different organizations. The challenges range from those affecting startups and smaller-scale local companies to those multinationals face.

Regarding MAI students, it happens something similar to MIRI students, being AI nowadays a hot topic and professors keeping up to date the subject's contents. In addition, there are also explicit opportunities to attend seminars for Professional Practices in AI and AI Seminars, where national or international lecturers can come for a week to explain relevant research in the field of Artificial Intelligence.

Finally, there are more than 300 final projects that have been done during the academic year 2019/2020, and more than 70% seem to be research-oriented either proposed by students, professors, companies and research centres (evidence E.2.1.11, TFE subfolder of External Practices and Labor Experience folder, with restricted access).

Pandemic-related adaptation of teaching methodologies (COVID-19 actions)

From the beginning of the pandemic, FIB has continued running all its studies from the very first day of the lockdown. At that moment, UPC had just signed an agreement with Google Education Suite, and that helped to keep performing synchronous lecturing at the same timetable with a large number of students.

In general, depending on the subject different mechanisms were used to continue the course that were also asked to be published on the specific learning platform for all the students, together with a dean's statement addressed to the FIB community (evidence E.2.1.11, Covid19- Announcements folder, with restricted access).

Some of the strategies carried out during the lockdown were:

- Use of video conference for synchronous lectures and practical classes
- Extra material with slides, videos, exercises and practical assignments
- Use of video and/or screencast material for asynchronous lectures and practical classes
- Use of the learning platforms (Atenea & Racó) for assignment submissions
- Use of email and/or forums for asynchronous consultation
- Use of chat and/or video conferencing for synchronous consultations

Regarding laboratories and practicals, several professors had to prepare all the material, even embedded boards, so that they could distribute them among the students one day before the lockdown. The idea was to be able to perform sessions that could not be carried out in a virtual mode by using boards (see Criterion 4.3). Other professors (see comments below) could manage to virtualise the sessions using cluster and systems remotely thanks to the TIC support. Generally, professors tried to keep constant contact and online support with the students.

In any case, the heads of studies were looking at any problems arising during lecturing both for students and professors due to the pandemic.

Regarding the evaluation, in the following section about Exams and Evaluations some proof of assessments and practicals are provided both during the lockdown and during the period when the pandemic situation became mild (after summer 2020). With regard to the lockdown period, it must be said that all the evaluations were carried out online.

Some examples of online evaluations were:

- Exams performed through a moodle platform online (Atenea) using new hardware as well as software support added to provide enough computational power for several online exams with hundred of students
- Exams providing the exam statement and giving some limited period of time
- Submission of practicals via Racó
- Oral presentations and discussions using videoconference

After the lockdown period, the government healthcare commission and universities agreed to face-to-face exam assessments as long as the health measures were guaranteed. Due to the pandemic situation and the classroom limitations to ensure social distance, the number of opportunities to do evaluation out of the subjects timetable is reduced. Concerning FIB, one week in the middle of the semester is exclusively dedicated to evaluations. Therefore, in some cases subjects have had to adapt their assessment methods so that they can profit from at least one face-to-face evaluation as a mid-semester evaluation as well as a final examination at the end of the semester, if needed (see information addendum).

Regarding the final projects, their evaluations have been online thanks to the videoconference tool. ICT support during the lockdown period was crucial for integrating and creating a mechanism to prepare, build and give evaluation support to the final project evaluation committee. The overall feedback of the evaluation committees and students has been extremely good.

To end with, UPC performed a survey about the level of satisfaction of the students and professors during the lockdown period. The global satisfaction survey of students about the synchronous lectures using streaming was about 3.1 (out of 5.0) during the lockdown period, which is something that we should consider a good score (not ideal) when taking into account the 0 time transition from face-to-face to online classes. Indeed, if we look at the global satisfaction when it comes to the learning process and the professor's support, scores are 3.4 and 3.6, respectively (E.2.3.1, student survey of 2019/2020-Q2 semester, lockdown/confinement period, also available here).

Criterion 2.4 Support and assistance

For the GEI students, a welcoming orientation event takes place on the day of the students' first registration. Additionally, FIB's dean and the vice-dean Head of Academic Studies for Initial Phase welcome the students in a special event, where senior students also participate. Specific information on the usual administrative procedures and tutorship is also given.

After having enrolled at FIB, students support services include:

- Useful information for first year students, which has been gathered in a welcome guide web-page (see E.2.4.1).

- A tutorial action plan has been devised, which includes three different programs: peer mentoring (*mentories*) and peer academic mentoring (*aula lliure)*, both of them specially addressed to first year undergraduate students, and tutorship (see E.2.4.2).

Additional actions are organised for degree students in order to provide them with specific support and information about degree specialisations, final degree projects and mobility programs. Academic support services for master's students are also available.

- Peer mentoring (*mentories)*. Senior undergraduate/master's students welcome and accompany first year students during seven one-hour sessions at their first semester at FIB. The programme began in September 2016 and it is intended to ease integration in a new environment, to encourage the building of positive relationships and to give some tips in order to develop healthy and profitable study habits. Each new edition begins with a call throughout the month of May in order to attract mentors. The selected volunteers (at least 28 for GEI and 4 for GCED are required) receive completely free training in coaching tools (about 10 hours). A last-year student is the overall coordinator of the programme, working under the supervision of the vice-dean Head of Academic Studies for Initial Phase and the vice-dean for Students. Peer mentoring sessions begin at the same time that the academic course and each mentor takes responsibility for 15-18 new students. Communication outside of sessions is highly encouraged and is carried out using the FIB intranet (Racó). A guide for sessions has been published through the Creative Commons license (E.2.4.3)

A review of last editions of the programme can be found at evidence E.2.4.4. According to surveys launched at the end of every edition, the majority of students are satisfied or very satisfied with the programme (65,4% in 16/17, 86% in 19/20) and would recommend it to new enrolled students (75,8% in 16/17, 90% in 19/20). Additionally, some impact on academic performance has been noticed in spite of the lack of discussions on academic subjects during the meetings: greater fidelity to the programme brings about better academic performance.

- Peer academic mentoring (*aula lliure*). The programme began in September 2017 and it is addressed to GEI students. Within the program, senior students deliver support classes to first year students free of charge. Subjects of Q1 (F, FM, IC, PRO1) are taught during the fall semester and those of Q2 (M1, M2, EC, PRO2) in the spring semester. A senior trainer acts as the coordinator of the programme. They are responsible for the initial call and selection of trainers, sessions scheduling and admission process, under the supervision of the vice-dean Head of Academic Studies for Initial Phaser students and the vice-dean for Students. Around the third week of the semester, first year students apply to the programme, applications are processed within one week, and the beginning of sessions takes place in the fourth week of the term. A minimum of 10 sessions per subject and semester are scheduled, with every session lasting two hours. A review of last editions can be found at the website. As confirmed by the surveys that have been carried out, the experience is proving positive both for the students who practice for the first time as teachers in front of their peers and for those who are mentored, since more than 90% confirms that the programme is really useful and they would recommend it (see E.2.4.5). An analysis of the results obtained for six subjects mentored during the academic years 2017/2018 and 2018/2019 can be found in E.2.4.6.
The dropping out rate at GEI has significantly decreased since the launch of these mentoring programmes (26,6% in 14/15, 24,3% in 15/16, 19,7% in 16/17 and 21,7% in 17/18, on the first year; 46,8% in 15/16, 42,6% in 16/17, 42,1% in 17/18, 35,9% in 18/19 and 30,6% in 19/20, during the whole degree) (see E.1.1.2). This outcome shows how relevant guidance programs are to improve student's success.

- Tutorship. FIB offers a tutoring programme that provides guidance to all students at GEI, GCED and masters degrees on a voluntary basis. Tutorship is mainly undertaken by the Head of Academic Studies at GCED, the master coordinator at MEI, the specialisation coordinator and the master coordinator at MIRI, master's professors, master's university coordinators and the general master coordinator at MAI. The FIB intranet is a powerful tool in the processes involving tutorship. Students sign up for a tutor, and tutors volunteer as such by using a specific application developed within the Racó. Moreover, thanks to it tutors can check relevant information about tutored students (registered subjects, timetables, e-mail addresses) as well as supporting material to prepare tutorship meetings. As for the GEI, about 60 students are tutored every semester with the assistance of about 25 professors. Tutorship at FIB scored highest among all UPC schools and faculties (5.7/10).

-Degree students can also address their queries to some of the school dean's staff (vice-deans Head of Academic Studies, vice-dean Head of Academic Studies for Initial Phase and vice-dean for Students). Students can meet them on their scheduled times, which are available on the FIB website. They can also arrange an appointment by telephone or e-mail.

Students give a high score to tutorship satisfaction (3,1). Based on specific surveys on the mentorships programmes for first year students (E.2.4.4 and E.2.4.5) it can be concluded that a vast majority of them highly recommend to participate at the programme, not only as students but also as mentors.

- Students' associations. The student's representative body at FIB is the students' delegation (see E.2.4.7), which is also responsible for giving support to students' general and academic-related questions. A wide range of associative, cultural, sports and leisure opportunities are available for FIB students (see E.2.4.8 FIB Associations).

- Equal opportunities. FIB ensures equal opportunities for students with disabilities. The dean appoints a responsible for inclusion (E.2.4.9), who works in close collaboration with the UPC Office for Equal Opportunities (see E.1.4.5) . Specific support is given to students with special educational requirements. The total amount of these students has increased by 40% as a consequence of the COVID-19 crisis.

- Gender equality. UPC has defined a Gender equality plan (evidence E.2.4.10). The protocol for prevention and action against sexual harassment and of sexual orientation, gender identity or gender expression affecting students in the university environment of the UPC was updated in 2019 (evidence E.2.4.11). This also applies to external practices.

Student professional guidance

Finally, just before graduating, some professional guidance is available:

- Two types of educational cooperation agreement with external organisations allow students to apply and complement the knowledge they acquired during the degree through internships at companies and public administration institutions that collaborate with the FIB (E.2.4.12). FIB students were opting for these agreements in growing numbers in recent years, and they can also develop their Final Degree Project within those external contexts.
- Jobs bank. The school has a jobs bank (evidence E.2.4.13), which is updated on a daily basis and is widely used by the students. They can find both internships and job offers, along with detailed information, such as the company name, the location of the job, timetable, requisites and contact information for interested people to apply). Any question regarding jobs/internships can be addressed to the External Projects and Relations Area.
- inLabTALENT training programme (see Talent at E.0.1.8 inLab FIB). Experiential learning is also provided through inLab FIB, an innovation and research lab based at FIB for providing a learning lab specialised in informatics engineering, creating a professional environment focused on developing talent and training our students, and developing multidisciplinary R+D projects. 37 students were tutorised through the inLab Talent programme during the academic year 2019/2020 (19,4% women). The inLabTALENT project has been selected for the portal of good teaching innovation practices of the Catalan Association of Public Universities (ACUP), a portal managed jointly with the Secretariat of Universities and Research.
- FIB Business Seminars provided by external organisations. These short courses, which are delivered by industry and professional services, allow students to catch up on the latest ICT advances. These courses were organised once a year as a whole pack, but they have been recently integrated within the activities of FIB Visiona.
- FIB Visiona (E.2.4.14) is the student organisation within FIB that under different names for nearly 30 years has organised a face-to-face job fair both in spring and autumn, where a number of IT companies (including leading multinational corporations in the IT sector) make their presentations to students, hold conferences and introduce students into the labour market through personal interviews and CV reviews. Along the year, meetings and workshops with cutting-edge IT companies and institutions are organised,which have assumed the purpose of what was previously named FIB Business Seminars (prior point).

Graduates give similar scores for professional guidance satisfaction in all degree programmes. External internships are highly scored (GEI 3.8, MEI 4, MIRI 3.2 and MAI 3.4). It should also be mentioned that the FIBAlumni graduates' association E.2.4.15 (now in collaboration with the E.2.4.16 UPC Alumni), offers professional orientation, seminars and meetings to keep in touch once graduated.

We have identified improvement plans to increase interest for research among GEI students [270.M.515.2021], to open research opportunities for master students [270.M.520.2021] and to Increase collaboration with the Barcelona Supercomputing Center and other research centres for MAI students [270.M.519.2021].

Support for mobility programmes and foreign student support

OUTGOING

At the end of February or beginning of March, there is a presentation for FIB students to inform them about their possibilities of doing a mobility stay, that is, what they can do during their mobility, when they are allowed to go abroad, where they can go. Personal attention is given both by the mobility officer at the Academic Office and by the vice-dean for International Relations, either by mail, phone or personal appointment. There is also a FIB International Facebook page where students who have already gone on mobility can share their experience about the different destinations.

Shortly after that, the application period starts. Students choose a list of possible destinations, according to their preferences and the advice received. At the end of that period, the places are assigned and the students must confirm or reject the assignment.

Once the students have confirmed the place assigned, they prepare the learning agreement according to their interests, the academic offer at the destination and the possibilities of recognition. The students receive the support of the Academic Office and the vice-dean of International Relations to prepare that document.

INCOMING

Students can access the information about doing a mobility stay at FIB at:
- Academic stays
- Research visit

They can get personal advice about it from the Academic Office both by email and by phone. All the admission process is done through an online application, from the nomination made by the home institution of the student to the final admission. When the student is accepted, the student and the home institution can download the learning agreement and the admission letter from that same application.

The UPC organises an Orientation Week, addressed to international students who have to start their studies at the UPC in each semester. The OW includes an institutional welcome, information on compulsory legal procedures, information about the main UPC services that can be of interest to the students during their stay and an introductory workshop on Catalan language and culture.

Within that week, FIB hosts a welcome event where we give students practical tips about the school and their life there (how to find the classrooms, the timetables, the assessment methods, etc.).

The UPC offers a "buddy" programme called Salsa'm, in which incoming students can request to be mentored by a local student (usually a local student can mentor 3 to 5 incoming students). Additionally, the UPC chapter of ESN offers incoming students activities all along the semester.

3. Exams: System, Concept & Organisation

Criterion 3 Exams: System, concept and organisation

The evaluation method of all the degree subjects is public in the syllabus and accessible through the FIB web pages. According to the EHEA framework, a sufficient number of assessment activities of varied types are planned for each subject and they allow both the summative and the formative evaluation of the students. All the assessment activities are consistent with the specific goals and generic competences assigned to the subject in the curriculum, as is specified in detail in the teaching guides of the subjects. The evaluation method of each subject is reviewed each semester by the Degree Academic Committees at the request of the professor in charge of the subject, who proposes the required modifications for a better adaptation to the target learning outcomes.

The evaluation methods used include exams, assignments, lab sessions, projects, and presentations. The evaluation method is tailored to the course objectives and competences. Each Degree Academic Committee is responsible for checking the procedures so that each course reliably and accurately evaluation of the learning objectives and competences is done.

See Criterion 5.3 for evidence on regulations for each degree.

The basic guidelines for subject assessment are gathered in the "Academic regulations for degree and master's students at UPC" document (E.3.0.1). It states the student's rights and obligations during the assessment procedure. For instance, for those students that cannot take an examination for exceptional reasons that can be duly justified, the faculty must fix an alternative date for them to be assessed within the corresponding academic period. Moreover, according to these regulations, students are entitled to request a review of their assessment results. Under no circumstances other than a transcription error will the review procedure lead to a lower mark being awarded. Appealed decisions made by professors are also possible. The student must file an appeal with the director or dean of the school explicitly stating the reasons, within seven days of the publication of the mark in question.

The professor responsible for a subject, together with the professors who teach it, must propose a teaching guide that explains the assessment criteria and grading method to be used and the weighting of assessed activities. The specific Academic Commission that oversees student assessment is responsible for approving the teaching guide prior to the start of the academic year, distributing it as widely as possible using the resources it has, ensuring that it is followed correctly and interpreting it if any doubts arise. A detailed version of teaching guides is published at the website, which is updated every semester. More details on teaching guides can be found at Criterion 3.1.

Specific FIB regulations for exams and grades have been published on the web page (E.3.0.2). These regulations refer to issues such as the publication of the conditions of the exams and the deadlines for the publication of grades and revisions (for instance, assessment results should be delivered within two weeks and their revision should take place 24 hours after having published the results).

If a fraudulent act concerning a student's assessment occurs, a specific protocol of action exists at FIB (E.3.0.3). The protocol requires the existence of the so-called Disciplinary Committee, whose members are the dean, the vice-deans Heads of Academic Studies, the vice-dean for Postgraduate

Studies and the student delegate. After hearing the teachers and the students involved, the committee will decide on the application of the disciplinary measures.

Materials involved in 2018/19, 2019/2020 and 2020/2021 academic year evaluations for students of the subjects commented above have been collected (evidence E.2.1.11, Proof of Executions folder, with restricted access). In particular, we have tried to collect exams, mid-semester and final examinations, practices and final projects of the GEI, MEI, MAI and MIRI. We have decided to include some material of academic years 2019/2020-Q2 and 2020/2021 to show some of the evaluation done during the lockdown situation. In 2019/2020-Q2, we had to move from face-to-face to virtual classes overnight. All subjects had to adapt their lectures, material and evaluation to this situation in less than one week. Nowadays, we can carry out face-to-face evaluations in the campus, but subjects' lectures may be either completely face-to-face classes (for the first year of GEI) or up to 100% virtual classes (for MAI studies). On the other hand, all the final examination statements and solutions, several mid-semester examinations and solutions as well as final projects can be found on the UPC commons repository of exams (E.3.0.4).

The GEI and masters academic calendar is published together with the final project defence period and the global final examination evaluation period. In the case of the current academic year (2020/2021), a mid-semester examination week has been booked in half semester. This mid-semester examination week helps to do a face-to-face exam week free of lecturing in the campus due to the pandemic situation.

Regarding the detailed exam calendar, each programme publishes the mid-semester and final examinations (evidence GEI- E.3.0.5, MEI-E.3.0.6, MIRI-E.3.0.7 and MAI-E.3.0.8) on the web before the students are enrolled. The exams in this calendar are those that do not appear in the official timetable of the subjects. In this way, students plan which subjects they want to enrol to avoid having more than one exam on the same day, for instance. On the other hand, each subject guide explicitly indicates which are the activities of evaluation and the approximated week when those are carried out along the semester. In the same guide, all subjects have to specifically publish the assessment criteria, which has to be evaluated prior to the enrolment of the students by the academic commission of the studies in case they are changed. For instance, SO-MIRI has its assessment criteria published where several assignments are required: 5 Reading assignment activities in red square in weeks 2, 4, 8, 10 and 13, and a final examination in week 15.

Regarding the final projects, all their evaluation process is published and all students know it in advance. In addition, students are notified through the Racó platform indicating which the next assignment deadlines are. In general, there is a proposal evaluation (accept or reject) assignment before the enrolment of the final project, GEP assignment evaluation in the case of GEI students, follow-up assignment evaluation for the GEI, follow-up assignment coordination with the director/tutor, memory assignment evaluation by the tutor/director, and assignment evaluation committee. For the evaluation committee, students are required to publish and upload the final project to the Racó platform one week before the defence is performed. This Racó platform also includes a system against plagiarism based in Urkund that helps the programme committee to avoid unfair situations.

Regarding the progress of studies, the next figure shows the percentage of students that pass (axes y) the compulsory subjects of GEI (axes x) for several consecutive years (year (semester)). First year GEI subjects (F up to PRO2, initial phase) usually have lower performance than other subjects because during this period there are several students that will end their studies.
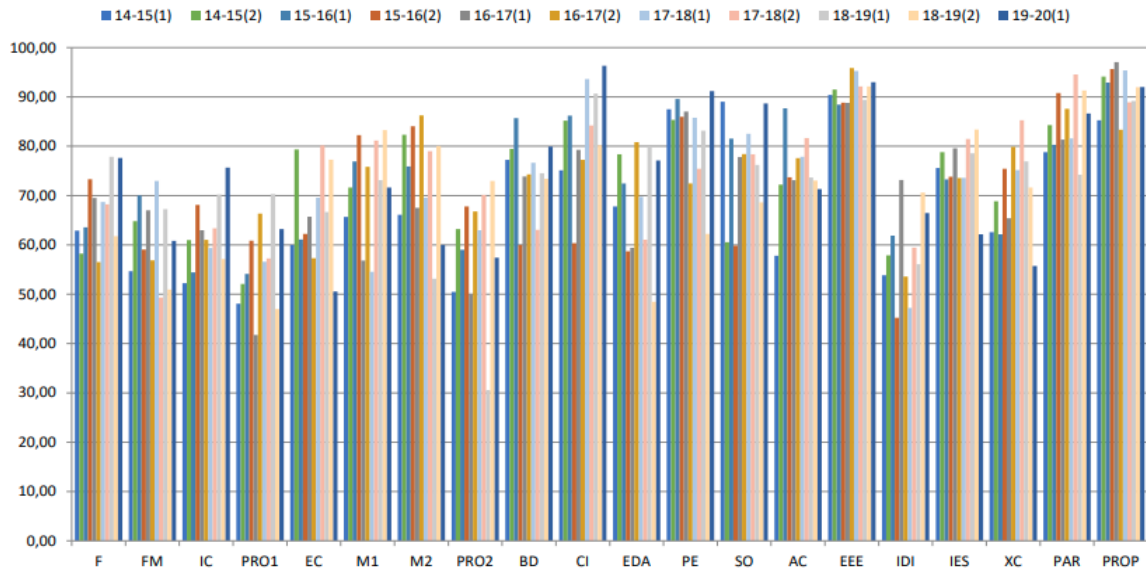
After the first year, the average % of students who have passed is about 70-90% and we can also see that during calendar semesters (students passing subjects at the expected time) their performance is better than other semesters.

In any case, the percentage of students who have passed has significantly improved from 2014. One of the reasons for the first-year students' performance is the number of tutorial actions done.

Once the students are doing their specialisation subjects, their performance is usually over 70%.

With regard to the masters, the following figures show the total number of students (Tot), the number of students passing the subject (Apr), the number of students that almost pass the subject (Sus>=4), the number of students that do not pass the subject (Sus.), and the number of students that do not perform any evaluation activity. Therefore, the percentage of students is shown in relation to having or not having passed the subject, by taking or not into account the number of students that do not attend any activity (Sense NP). Finally, the average grade is displayed.

MAI students' performance 2019/20-Q1

In general, the performance of students is quite good. In the particular case of the NTR, the number of students is small and three students decided to give up.

Assig.	Tot	Apr.	Sus.>=4	Sus.	NP	% Apr	% Sus	Sense NP % Apr	Sense NP % Sus	NM sense NP	MHs
CI	34	33	0	0	1	97,06%	2,94%	100,00%	0,00%	7,92	1
CV	33	32	0	0	1	96,97%	3,03%	100,00%	0,00%	8,21	2
IHLT	39	34	3	1	1	87,18%	12,82%	89,47%	10,53%	7,03	2
IMAS	33	32	0	0	1	96,97%	3,03%	100,00%	0,00%	9,07	1
IML	37	35	1	0	1	94,59%	5,41%	97,22%	2,78%	8,44	0
PAR	32	31	0	0	1	96,88%	3,13%	100,00%	0,00%	8,57	2
BDA	10	10	0	0	0	100,00%	0,00%	100,00%	0,00%	8,40	0
DL	21	18	1	2	0	85,71%	14,29%	85,71%	14,29%	7,04	0
IDADM	7	7	0	0	0	100,00%	0,00%	100,00%	0,00%	7,71	1
CIR	23	22	0	0	1	95,65%	4,35%	100,00%	0,00%	8,64	0
HLE	24	23	1	0	0	95,83%	4,17%	95,83%	4,17%	7,60	1
IDSS	16	16	0	0	0	100,00%	0,00%	100,00%	0,00%	8,46	0
NDVW	25	25	0	0	0	100,00%	0,00%	100,00%	0,00%	9,01	0
CPP	21	20	0	0	1	95,24%	4,76%	100,00%	0,00%	7,28	1
IDAAB	25	25	0	0	0	100,00%	0,00%	100,00%	0,00%	9,19	0
ISP	21	21	0	0	0	100,00%	0,00%	100,00%	0,00%	8,36	0
NTR	5	2	0	0	3	40,00%	60,00%	100,00%	0,00%	9,00	0
PPAI	21	17	0	4	0	80,95%	19,05%	80,95%	19,05%	6,94	1
AHCT	19	18	0	0	1	94,74%	5,26%	100,00%	0,00%	8,12	0
AVPR	4	2	0	0	2	50,00%	50,00%	100,00%	0,00%	7,90	0

MEI students' performance 2019/20-Q1

Assig.	Tot	Apr.	Sus.>=4	Sus.	NP	% Apr	% Sus	Sense NP % Apr	Sense NP % Sus	NM sense NP	MHs
ACAP	27	20	1	4	2	74,07%	25,93%	80,00%	20,00%	5,61	0
CSI	26	23	0	0	3	88,46%	11,54%	100,00%	0,00%	7,00	1
SEU	20	19	0	0	1	95,00%	5,00%	100,00%	0,00%	8,31	1
SGI	24	22	2	0	0	91,67%	8,33%	91,67%	8,33%	7,05	1
PEGTI	19	18	0	0	1	94,74%	5,26%	100,00%	0,00%	8,80	0
ID	8	8	0	0	0	100,00%	0,00%	100,00%	0,00%	8,94	0
TMD	7	6	0	0	1	85,71%	14,29%	100,00%	0,00%	9,07	0
IKPD	8	8	0	0	0	100,00%	0,00%	100,00%	0,00%	9,18	0
MEEGQ	9	9	0	0	0	100,00%	0,00%	100,00%	0,00%	9,67	0
SECS	10	9	0	1	0	90,00%	10,00%	90,00%	10,00%	6,60	0

As for MEI, from the point of view of the percentage of students who have passed all the subjects have had a good performance.

MIRI students' performance 2019/20-Q1

Assig.	Tot	Apr.	Sus.>=4	Sus.	NP	% Apr	% Sus	Sense NP % Apr	Sense NP % Sus	NM sense NP	MHs
AMMM	61	44	5	6	6	72,13%	27,87%	80,00%	20,00%	6,09	1
CPDS	48	39	2	5	2	81,25%	18,75%	84,78%	15,22%	6,33	1
SMDE	55	48	0	2	5	87,27%	12,73%	96,00%	4,00%	7,62	2
TMIRI	52	49	0	1	2	94,23%	5,77%	98,00%	2,00%	7,41	0
RA	19	14	2	1	2	73,68%	26,32%	82,35%	17,65%	7,26	1
AGT	17	15	0	1	1	88,24%	11,76%	93,75%	6,25%	7,63	0
AVLSI	6	6	0	0	0	100,00%	0,00%	100,00%	0,00%	6,42	0
CSN	21	18	0	3	0	85,71%	14,29%	85,71%	14,29%	7,62	0
GTCG	21	15	2	2	2	71,43%	28,57%	78,95%	21,05%	6,77	1
VAR	16	15	0	0	1	93,75%	6,25%	100,00%	0,00%	7,97	0
CA	16	16	0	0	0	100,00%	0,00%	100,00%	0,00%	8,20	1
GPR	10	10	0	0	0	100,00%	0,00%	100,00%	0,00%	8,76	1
SV	8	8	0	0	0	100,00%	0,00%	100,00%	0,00%	8,48	1
CNANM	7	6	0	0	1	85,71%	14,29%	100,00%	0,00%	8,00	0
SANS	6	6	0	0	0	100,00%	0,00%	100,00%	0,00%	9,17	1
SNM	8	7	0	0	1	87,50%	12,50%	100,00%	0,00%	7,79	1
FINE	15	15	0	0	0	100,00%	0,00%	100,00%	0,00%	8,49	1
IAS	17	15	0	0	2	88,24%	11,76%	100,00%	0,00%	7,77	2

Assig.	Tot	Apr.	Sus.>=4	Sus.	NP	% Apr	% Sus	Sense NP % Apr	Sense NP % Sus	NM sense NP	MHs
DAKD	30	26	0	0	4	86,67%	13,33%	100,00%	0,00%	7,94	0
DW	41	28	1	7	5	68,29%	31,71%	77,78%	22,22%	5,44	0
ASM	25	21	2	1	1	84,00%	16,00%	87,50%	12,50%	6,13	0
BSG	22	21	1	0	0	95,45%	4,55%	95,45%	4,55%	6,18	0
IR	22	22	0	0	0	100,00%	0,00%	100,00%	0,00%	7,88	0
KMLMM	25	23	0	0	2	92,00%	8,00%	100,00%	0,00%	8,04	0
OTDM	25	25	0	0	0	100,00%	0,00%	100,00%	0,00%	7,40	1
OS	16	14	1	1	0	87,50%	12,50%	87,50%	12,50%	6,53	0
PA	18	14	0	0	4	77,78%	22,22%	100,00%	0,00%	8,16	0
CHPC	17	17	0	0	0	100,00%	0,00%	100,00%	0,00%	8,09	0
PD	15	15	0	0	0	100,00%	0,00%	100,00%	0,00%	9,83	4
SA	14	14	0	0	0	100,00%	0,00%	100,00%	0,00%	9,44	1
SCA	11	11	0	0	0	100,00%	0,00%	100,00%	0,00%	7,99	1
ADSDB	12	9	0	2	1	75,00%	25,00%	81,82%	18,18%	6,73	0
VBP	23	23	0	0	0	100,00%	0,00%	100,00%	0,00%	7,61	0

Generally, all the MIRI subjects have shown good behaviour. Only DW presents lower performance whether we consider the total number of students. Apparently, the reason why DW students gave up may be related to its significant amount of continuous work.

4. Resources

Criterion 4.1 Staff

Academic and support staff (management and technical) deal with the accomplishment of programme outcomes.

Academic staff

Even though universities cope with a scenario of budgetary austerity, there is sufficient teaching staff in the school and staff assignments are appropriate for them to carry out their duties and assist students. FIB requests academic staff in charge of teaching subjects in eight UPC departments (evidence E.0.1.9). Their professional experience and investigation is carried out by means of different groups of research and investigation bodies (see E.0.1.10).

Academic staff are requested to several departments (8 of the UPC), 240 people of whom collaborated last academic year with teaching allocation mainly at FIB. The total number of students last academic year was 2,439. It includes the 4 new EHEA degrees submitted for accreditation (GEI, MEI, MIRI and MAI), Bachelor's degree in Data Science and Engineering (GCED), Erasmus Mundus Master in Big Data Management and Analytics, and Master in Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching (MSEC) (see E.1.1.10).

Academic staff with teaching allocation mainly at FIB the last four academic years together with their category distributions are shown on the following tables (E.0.1.3 - FIB main facts and figures):

		Full Professor	Tenured University Professor	Full Professor (college)	Full Professor (college)	Associate Professor	Tenured Assistant Professor	Associate Full Professor	Faculty	Assistant Professor	Lectures	Other	TOTAL
	2019-2020	27	83	1		7	46	2	9	-	63	2	240
Academic staff with teaching allocation mainly at FIB (PDI first assignment)	2018-2019	29	84	1		7	47	2	9	-	47	2	228
	2017-2018	28	86	1		7	46	2	9	-	41	2	222
	2016-2017	27	89	1		7	49	-	10	-	33	1	217

Professors with permanent positions in Spain can be employed by the national Spanish Government (civil servants) or by the regional government. Their positions correspond to full professors, associate professors, and assistant professors.

During the past four years, academic staff distribution in categories has evolved from 183 to 175 permanent academic staff (that is, from 84,3% to 72,9%) and from 34 to 65 non-permanent academic staff. As for PhD holders, they have gone from 190 to 192 (that is, from 87,5% to 80,0%), and from 27 to 48 in the case of non-PhD holders (see section 4.2 for detailed information about each programme degree).

		Permanent PhD	Permanent Non- PhD	Non- Permanent PhD	Non- Permanent Non- PhD	TOTAL
Academic staff with teaching allocation mainly at FIB (PDI first assignment)	2019-2020	169	6	23	42	240
	2018-2019	173	6	16	33	228
	2017-2018	172	7	14	29	222
	2016-2017	175	8	15	19	217

Lecturers are professionals that work outside the university and are experts of recognised competence. They are hired on a temporary and part-time basis to contribute with their knowledge and professional experience to the university.

The decrease in universities funding has led to a declining number of permanent teaching staff, being replaced by non-permanent teachers (mainly lecturers) who combine university activity with other jobs. This policy means there is a lack of generational change of permanent teaching staff. Likewise, in this group the percentage of doctors and people who carry out research activities has been reduced.

Lecturers principally teach professional-oriented subjects. Thus, universities combine the academic approach offered by permanent academic staff with a professional perspective provided by non-permanent academic staff.

Therefore, academic staff meet the qualification requirements for programme delivery and they have sufficient and recognised experience in teaching, research, and where applicable, professional background. Merit-based salary increases for teaching and research at public universities in Catalonia are regulated. These increases or premiums, are an annual individual consolidated amount allotted by each university's board and subject to a positive evaluation by AQU. Merits in research are evaluated according to six-year periods of research while merits in teaching are evaluated according to five-year periods.

UPC carries out an annual evaluation of the teaching staff and defines four categories from A, as the best, to D, according to several indicators. During the academic year 2019/2020, the percentage of academic staff in the four categories A, B, C or D for both teaching and research were as follows: 79.47% of FIB academic staff have A or B categories for both teaching and research (66.2% have A in teaching and A in research).

The allocation of teachers to the different training activities is carried out in coordination with the departments. Regarding the subjects, one teacher plays the role of coordinator and is responsible for coordinating the teaching team and for talking to the students. The syllabus includes the list of teachers involved in each subject.

In the first year subjects, people with good educational attitudes and accessibility who have the capacity to support students in their learning process and integration in the university are chosen. They are permanent teachers with extensive teaching experience.

Academic regulations for the final degree thesis set the profile of the teaching staff (or the professional profile in the case of an internship in a company) that can lead the project. Project supervisor has to be a graduate assigned to the FIB with teaching experience of at least three years as well as a good knowledge of the curriculum of the school. When the project is carried out at a company, the supervisor is a graduate working at the company, and a FIB teacher acts as an advisor with the aim of ensuring that the work meets the school requirements.

A final project can be co-directed by two or more people. In any case, at least one of them must meet the requirements of the senior professor and assume all the responsibilities assigned in the regulations to the director of the final project.

In relation to internships, they are not compulsory for any of the programme degrees. Any teacher in the school can be the internship tutor and they will be in charge of supporting the student and supervising that the activity meets the school requirements.

The academic staff involved in each subject is published in the FIB annual report. The results for UPC student satisfaction surveys show good assessments for instructor and subject satisfaction, as can be seen in the Criterion 2.1 section.

A detailed information of the academic staff with teaching and research experience, projects and department affiliation is available with limited access (evidence E.2.1.11, "Research and lectures merits activities" folder, with restricted access).

GEI academic staff:
Detailed indicators of GEI academic staff are included in evidence E.1.1.2. The current list of faculty assigned to this degree programme is available at evidence E.4.1.1 (with links to detailed description of their scientific production and activities).

A total of 256 teachers participated in GEI during the academic year 2019/2020. Permanent teachers carried out 79,4% of the teaching activity (20,6% was in charge of non-permanent teachers). 81,5% of the teaching activity was carried out by PhD holders (18,5% in charge of those with just a master's degree).
Academic staff with teaching merits carried out 78,9% of the teaching activity. Regarding research merits, 63,7% of that teaching activity was performed by teachers with a positive research evaluation. In the case of teachers without merits, their situation is due to their kind of contract that does not allow them to do so (e.g. lectures).

The following table summarises the teaching merits according to teachers' departments.

GEI		Total	Teaching merits	Research merits
701	AC	62	49	44
707	ESAII	14	8	6
715	EIO	19	9	8
723	CC	69	60	53
732	OE	13	7	3
747	ESSI	31	17	14
748	FIS	10	10	10
749	MAT	27	19	17

There are five kinds of learning activities in GEI: theory classes (with a maximum of 60 students per group), problem classes (maximum of 40 students per group), laboratory (maximum of 20 students per group), guided learning activities (individual or small group) and autonomous learning activities. The student/teacher ratio in the academic year 2019/2020 was 9.17.

MEI academic staff:

Detailed indicators of MEI academic staff are included in evidence E.1.1.4 The current list of faculty assigned to this degree programme is available at evidence E.4.1.2 (with links to detailed description of their scientific production and activities).

A total of 29 teachers participated in MEI during the academic year 2019/2020. Permanent teachers carried out 74,7% of the teaching activity (25,3% was in charge of non-permanent teachers). 76,5% of the teaching activity was carried out by PhD holders (23,5% in charge of those with just a master's degree). As can be seen, MEI has a significant number of industry professionals who participate in the master's degree as non-permanent part-time teachers.

Academic staff with teaching merits carried out 71,2% of the teaching activity. Regarding research merits, 67,3% of that teaching activity was performed by teachers with a positive research evaluation. In the case of teachers without merits, their situation is due to their kind of contract that does not allow them to do so (e.g. lectures).

MEI		Teaching merits	Research merits
701	AC	7	7
707	ESAII	2	0
715	EIO	1	1
723	CC	7	7
732	OE	1	0
747	ESSI	3	3
749	MAT	2	2

There are five kinds of learning activities in MEI: theory classes (with a maximum of 40 students per group), problem classes (maximum of 20 students per group), laboratory (maximum of 20 students per group), guided learning activities (individual or small group) and autonomous learning activities. The student/teacher ratio in the academic year 2019/2020 was 6,9.

MIRI academic staff:

Detailed indicators of MIRI academic staff are included in evidence E.1.1.6. The current list of faculty assigned to this degree programme is available at evidence E.4.1.3 (with links to detailed description of their scientific production and activities).

A total of 93 teachers participated in MIRI during the academic year 2019/2020. Permanent teachers carried out 89,6% of the teaching activity (10,4% was in charge of non-permanent teachers). 93,1% of the teaching activity was carried out by PhD holders (6,9% in charge of those with just a master's degree).

Academic staff with teaching merits carried out 86,9% of the teaching activity. Regarding research merits, 84,9% of that teaching activity was carried out by teachers with a positive research evaluation. In the case of teachers without merits, their situation is due to their kind of contract that does not allow them to do so (e.g. lectures).

MIRI		Teaching merits	Research merits
701	AC	32	30
707	ESAII	-	-
715	EIO	9	8
723	CC	32	31
732	OE	1	1
747	ESSI	2	2
748	F	-	-
749	MAT	1	1

There are five kinds of learning activities in MIRI: theory classes (with a maximum of 40 students per group), problem classes (maximum of 20 students per group), laboratory (maximum of 20 students per group), guided learning activities (individual or small group) and autonomous learning activities. The student/teacher ratio in the academic year 2019/2020 was 7,34.

MAI academic staff:

Detailed indicators of MAI academic staff are included in evidence E.1.1.8 (note: academic staff information includes only UPC personnel). The current list of faculty assigned to this degree programme is available at evidence E.4.1.4 (with links to detailed description of their scientific production and activities).

A total of 42 teachers participated in MAI during the academic year 2019/2020.

MAI-UPC: 24 academic staff (91% PhD), 92 merits in teaching positively evaluated, 64 merits in research positively evaluated, and currently participating in 12 competitive projects, such as IP and other 11 competitive projects (no IP).

MAI-UB: 12 academic staff (100% PhD), 30 merits in teaching positively evaluated, 20 merits in research positively evaluated, and currently participating in more than 30 competitive projects.

MAI-URV: 6 academic staff (100% PhD), 28 merits in teaching positively evaluated, 24 merits in research positively evaluated, and currently participating in 5 competitive projects, such as IP and other 3 competitive projects (no IP).

Permanent teachers carried out 88,5% of the teaching activity (11,5% was in charge of non-permanent teachers). 94,7% of the teaching activity was carried out by PhD holders (5,3% in charge of those with just a master's degree).

As for the UB, all of them are professors with a PhD and 75% have merits in teaching and research positively evaluated. The remaining professors without merits are both because they cannot have them due to their contract and because the professor has an ICREA grant. For URV professors, 100% of them have merits in teaching and research.

Academic staff with teaching merits carried out 86% of the teaching activity. Regarding research merits, 86% of that teaching activity was carried out by teachers with a positive research evaluation. In the case of teachers without merits, their situation is due to their kind of contract that does not allow them to do so.

	UPC	UB	URV
Teaching merits	88.4	75	100
Research merits	88.4	75	100

There are five kinds of learning activities in MAI: theory classes (with a maximum of 50 students per group), problem classes (maximum of 25 students per group), laboratory (maximum of 25 students per group), guided learning activities (individual or small group) and autonomous learning activities. The student/teacher ratio in the academic year 2019/2020 was 6,66.

Academic staff research and development activities

Scientific and technological production of FIB academic staff is described at FUTUR website (E.4.1.5). The following table summarises the most relevant research activities:

	Competitive projects	Non-competitive projects	Theses	Journal articles	Conference papers
2020	145	27	24	176	52
2019	164	37	31	199	213
2018	158	35	35	249	264
2017	166	35	36	221	267

Obviously, COVID-19 has had a negative impact in scientific and technological production in 2020.

With respect to MAI professors belonging to UB and URV, which do not appear at FUTUR website, most of them are nowadays participating in one or more national and European competitive projects. In the case of the UB, their 12 professors participate in a total of 19 national and European competitive projects. As for the URV, 6 professors participate in a total of 10 national and European projects.

Concerning FIB academic staff, it has a significant research activity. Evidence E.4.1.6 (with restricted access) reports research projects undertaken by them. Moreover, the UPC library service produces comparative reports on scientific production versus other national and international universities. "Computer science" is the thematic area with the most scientific production of the UPC (see E.4.1.7). Furthermore, this area is quite concentrated in the FIB: 24,462 of the 35,882 results related to "computer science" are tagged under "Facultat d'Informàtica de Barcelona". Relevance of the scientific and academic production of the UPC and FIB can be seen in the different bibliometric studies (see E.4.1.8), such as the comparative study of the scientific publication of UPC versus other national and international universities in the area of computer science (2007-2017) (see E.4.1.9). Another example of that relevance is the recerTIC UPC, which is a set of works that intends to give a representative view of the UPC's scientific publishing on topics of interest in the field of information and communication technologies (see E.4.1.10 for Computer security, E.4.1.11 for Machine learning, E.4.1.12 for Bioinformatics, E.4.1.13 for Data science, and E.4.1.14 for Robotics). These reports place the scientific production of the UPC (and therefore, of the FIB) as a world reference school in the field of informatics (computer science and engineering).

FIB Academic Staff research is carried out by means of different groups of research and investigation bodies, where international outstanding projects are being developed (see E.0.1.3): Barcelona SuperComputing Center (BSC-CNS), Virtual Reality Centre of Barcelona (CRV), Research Centre for Biomedical Engineering (CREB), IDEAI - Intelligent Data Science and Artificial Intelligence Research Center, and TALP - Center for Language and Speech Technologies and Applications. Besides those investigation centres, research is also carried out through inLab FIB.

The research groups listed below have among their members a significant number of professors who teach at FIB:

- ALBCOM - Algorithms, Computational Biology, Complexity and Formal Methods
- ARCO - Architectures and Compilers
- CAP - High Performance Computing Group
- CBA - Broadband Communications Systems and Architectures Research Group
- CNDS - Computer Networks and Distributed Systems
- DAMA-UPC - Data Management Group
- DCCG - Research Group on Discrete, Combinatorial and Computational Geometry
- DMAG - Distributed Multimedia Applications Group
- GESSI - Software and Service Engineering Group
- GIE - Engineering Informatics Group
- GNOM - Group of Numerical Optimization and Modelling
- GPLN - Natural Language Processing Group
- GRBIO - Biostatistics and Bioinformatics Research Group
- GREC - Knowledge Engineering Research Group
- GRINS - Intelligent Robots and Systems
- KEMLG - Knowledge Engineering and Machine Learning Group
- LARCA - Relational Algorithmics, Complexity and Learning Laboratory
- LOGPROG - Logic and Programming
- MD - Discrete Mathematics
- MPI - Information Modelling & Processing
- SIMCON - Computer Simulation in Condensed Matter Research Group
- SOCO - Soft Computing

- SUSHITOS - Services for Ubiquitous Social and Humanistic Information Technologies and Open Source Research Group
- ViRVIG - Visualization, Virtual Reality and Graphic Interaction Research Group
- VIS - Vision and Intelligent Systems

The research activity carried out by those research groups is closely related to the curricula of the masters taught at FIB.

Support staff

Support staff related to FIB involve both administrative and technical support staff (see E.0.1.7 FIB Staff) from the CNTIC Management and Support Unit (E.0.1.8, UTG CNTIC structure) and the innovation support staff (see E.0.1.9 inLab FIB).

UTG CNTIC management and technical support staff engages 160 employees. It is structured in different service units that provide the human resources needed to offer quality services. The units involved in the services of the Barcelona School of Informatics are the FIB Institutional Support and External Relations Unit (USIRE), FIB Degree and Master's Studies Management Unit (UGEGM), Resources and Services Unit (URiS), and ICT Services Unit (TIC).

As for the inLab FIB team (E.0.1.9 inLab FIB), it has additional academic and technical staff as well as students for the innovation, research and technology transfer activities. inLab FIB has been recognised as a TECNIO center by ACCIÓ, the Catalan Agency for Business Competitiveness.

The following table summarises the permanent support staff at FIB according to its unit.

Support unit	Permanent staff
USIRE	7
UGEGM	11
URiS	13
UTIC	21
inLab FIB	9

Criterion 4.2 Staff development

Teaching staff development

The institution offers support and opportunities for enhancing teaching quality. The ICE (in Catalan, *Institut de Ciències de l'Educació* - evidence E.4.2.1) offers a training plan for academic staff with a wide variety of lectures at UPC. The number of courses offered in 2019 was 170, a significant amount of which helped to support online teaching during the pandemic period. In 2018, 132 courses were available, as 95 in 2017 and 90 in 2016 (E.2.1.11 at "ICE Courses" folder with restricted access). FIB teaching staff has highly participated in several lectures since the new EHEA degrees were deployed being mainly devoted to innovation and new methodologies. In particular, more than 150 members of the academic staff at FIB have taken part in almost 100 courses, with a total of 691 attendances

from 2016. At the suggestion of FIB, ICE and other centres, a special training has also been carried out at ICE to promote English language among FIB academic staff (49 courses from 2016). Training and support is also provided to deal with students with special needs. Furthermore, online training has been offered during the pandemic period to improve virtual teaching and to use new tools.

Additionally, there is a close collaboration between FIB and ICE since the master's degree in Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching (MSEC) is mainly taught by professors of the institute and there are FIB academic staff both in the ICE management and in performing some lectures. This master is a mostly education-oriented training for teachers of pre-university levels (Secondary Education, High School Education and Vocational Training).

Teaching staff and gender perspective

Online training has been offered on how to incorporate gender perspective in university teaching. Special events have been organised related to this topic https://igualtat.upc.edu/ca/esdeveniments/la-perspectiva-de-genere-a-la-docencia. The number of courses concerning gender perspective has been 19 from 2016 (evidence E.4.2.2).

Main figures related with gender perspective are available at the UPC gender dashboard (in Catalan, by default UPC global figures; at "Centre" select FIB to see FIB information).

Furthermore, since 2019 a special permission has been allowed in order to enhance research activities after maternity leave.

Sabbatical leaves

UPC has implemented a specific programme for sabbatical leaves. This programme provides access to a paid leave for a maximum duration of 12 months. The aim of this action is to promote the research activity of the selected persons. Due to budget restrictions, the programme offers a limited number of sabbatical leaves.

Technical and administrative staff development
Staff training is organised in different areas: social responsibility, teaching support, research support, personal skills development, management and quality, information and communication technologies, languages, occupational health and safety, and legislative and regulatory framework (see E.4.2.3).

A specific programme aims to promote the learning and improvement of language skills including specific accompanying training actions for the official accreditation of English.

Criterion 4.3 Funds and equipment

Resources

FIB resources provide adequate support for the learning process, as shown in satisfaction surveys for academic and support staff and students. Learning facilities and learning equipment are well assessed by academic, support staff and GEI, MEI, MIRI and MAI students, and are considered to be appropriate for the number of students in the school.

The satisfaction surveys for academic staff and students show the highest scores in equipment (3,93 in E.4.3.2 FIB Academic staff satisfaction survey 2017/2018, 3,94 in E.4.3.4 FIB staff satisfaction survey 2018/2019, and 3,99 in E.4.3.1 FIB students satisfaction survey 2016/2017), on a grading scale from 1 to 5 (where 5 means "totally agree").

GEI graduates' survey shows a high score (4,2 over 5) on how the usefulness of the intranet and virtual campus is perceived. It also indicates a high appreciation of equipment (4,1) and library services (4,1) (see E.4.3.1). Master postgraduate students demonstrate a high level of satisfaction level with facilities and specialised resources: 4 for MEI, 3,9 for MIRI and 3,5 for MAI (see E.4.3.3).

The dean's staff is responsible for detecting the needs of the infrastructure and equipment, analysing their viability and taking the appropriate steps to meet those needs. It will be supported in the assessment of the hardware and software requirements presented by the ICT services unit of the UTG CNTIC. The management of material resources is performed according to process 270.1.4.1 of FIB Quality Assurance System.

FIB currently offers various material resources and facilities that help students during their learning path.

Lecture rooms (see E.4.3.5)

At the present, classrooms used for lecturing by the school are part of six North Campus modules exclusively intended to be used as teaching classrooms and they are shared with the other centres located on the campus.
Those six modules of the North Campus dedicated to teaching contain 86 teaching classrooms and 2 drawing classrooms, with a total built area of 7,871 m2 and a capacity for 13,400 students (6,700 students at the same time in two morning and afternoon shifts).

In order to respond to the challenges presented by COVID-19, several classrooms on the A1-A6 buildings have been equipped with cameras and ambient microphones to be used in hybrid mode (see E.4.3.6). These classrooms will allow the development of face-to-face teaching activity facilitating at the same time remote access to students who are unable to attend classes on campus due to the health situation.
The assignment of classrooms to the centres is reviewed each academic year according to the typology, equipment and capacity that the teaching of degrees requires. At this time, FIB has assigned 33 classrooms in modules A4, A5 and A6 of different typologies (small, medium-sized or high capacity) with room for 2,360 students divided into morning and afternoon schedules. All these 33 lecture rooms are equipped with a computer connected to the network, a projector and wireless coverage, and 23 of them are also equipped as hybrid classrooms.

Computer labs (see E.4.3.7)
The FIB annual report displays an extended description about activities, projects and resources at FIB computer labs (see evidence E.4.3.8 FIB Annual Report 2018/2019). The ICT services unit of the UTG CNTIC provides a detailed catalogue of IT services (see E.4.3.9), with 12 technical staff fully dedicated to FIB IT services, plus 9 people shared with other units.
Computer labs are sufficient for most classes as well as teaching laboratories are for subjects that require specific and/or more technical tools. FIB students have access to 19 computer labs and 2 group work classrooms with a total of 384 equipment (370 PCs, 10 iMacs and 4 quick reference

terminals with Raspberry) so that one place is available for roughly 5,5 students. A 3D printer is also available for academic works. All these labs are equipped with computers connected to the network, a projector and wireless coverage. Online requests for free labs are provided by the website.

Computers are renewed frequently so most of them are under warranty or could be replaced the same day.

All computer labs have programmes installed for student and teachers teaching activities that are required for each degree. Classrooms are used for teaching and either are booked by the teaching staff or are of free access when there is no allocated teaching in their established opening hours. Special configurations for online exams are also set up on demand (90 online exams were performed at computer labs during 2018/19, using an overall amount of 370 computer labs).

Five computer labs have been equipped also as hybrid classrooms. Mobile webcams are provided for the rest of them.

All labs are air-conditioned. Besides, improvements have been made to ventilation and air conditioning to prevent COVID-19 spreading: new windows, new air conditioning systems and air purifiers have been installed in different labs.

Other teaching labs (see E.4.3.10)
- Computer Architecture teaching labs (2 labs with 25 PCs each, 12 routers and 4 clusters).
- Automatic Control teaching laboratories (2 labs with 12 work places each, equipped with computers, oscilloscopes, function generators, robotic kits and other specialised material).
- Physics department lab (22 workplaces).
- Master's degree in Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching tech classroom (11 PCs and a workshop area with modelling tools, kits of specific training for mechatronics and electronics, PLC modules, electrical and varied systems tools).

Department labs are also described in E.4.3.8.

Servers and network infrastructure
In addition to the above mentioned, FIB ICT infrastructure has 40 physical servers (75 virtual servers), 46 terabytes of disc storage, 32 network switches, 21 wifi access points, 7 firewalls and 1,445 network connection points.

FIB ICT services to support teaching and learning

Management of FIB ICT services is performed according to process 270.1.4.2 of FIB Quality Assurance System.

Remote access to computer labs equipment is also available through specific services (VPN, Coronabroker, etc.), which have been reinforced during the pandemia (see IT services to study remotely at E.4.3.9).

These are some of the FIB services for learning and teaching:

AulaVirtual
FIB offers AulaVirtual service, a virtual desktop environment based on RAVADA (an open source UPC project) providing up to 80 virtual computers that can be used remotely with the same services as the computer labs.

Coronabroker
A special service developed to allow students to allocate and remotely use free computers in the labs. It was set up during the first weeks of the lockdown in response to the pandemic situation.

Virtual servers
A cloud infrastructure is offered for certain courses. Students can develop their practice with their own virtual servers (see Cloud FIB for teaching service at E.4.3.9).

Racó
Racó is the FIB's own intranet that provides access to timetables, syllabus, subjects' information and updated news.
Racó has special applications to support different academic activities and processes, such as the final degree submission and evaluation.
The FIB annual report includes indicators of usage of Racó (see ANNEX IV at E.4.3.8): more than 1,300,000 visits to Raco.
The MAI degree also uses UB and URV intranets.

Specific support tools
The school has also developed some specific tools for teaching. This is the case for Jutge.org (https://jutge.org/), LearnSQL (https://learnsql.fib.upc.edu/moodle/) and RACSO platforms (https://racso.lsi.upc.edu/juez/). They are automatic correction tools of computer programs, SQL statements and formal languages, respectively. Those tools are used in some subjects of programming and databases and they are not only limited to evaluating students' assessments but also to giving feedback and helping them throughout the learning process.

UPC ICT services to support teaching and learning

EDUROAM wifi connection
Additionally, EDUROAM wireless connections are available to students and the rest of the university community in all the buildings and school premises: campus classrooms, library, outdoor spaces of the campus, etc.

Atenea Virtual Campus
UPC moodle adaptation. This platform enables to exchange information and communication between teachers and students, publish materials and activities of the subject and access from mobile devices**.**
A specific area for exams (ATENEA Exams) has been set up to improve reliability and scalability for evaluations. WIRIS integration with ATENEA allows powerful questionnaires.

GSuite Enterprise for Education
UPC current contract includes video and voice conferencing in large meetings (up to 250 participants) with recording functionality (using Gmeet), groups, chat, drive and other tools to support learning and collaboration.

Plagiarism detection tool
A system based on the URKUND software, which compares the contents to be reviewed with the public documents found on the internet, published material and documents delivered through this tool within the UPC scope is used to avoid plagiarism. This tool is integrated with ATENEA and Racó (for final degree projects plagiarism checking).

UPC Estudiants APP (mobile application)
The UPC mobile app for students provides updated news and personalised schedules for students.
UPC estudiants APP can be installed from AppleStore or GooglePlay.

e-Secretaria
It gives access to enrollment, official certificates and official procedures.

UPC library

The Rector Gabriel Ferraté Library provides FIB with different services. All UPC libraries offer users a wide range of library services and access to information, bibliographic collections as well as a digital library. They also have extensive opening hours, computers connected to the internet and individual and group workspaces.

The UPC libraries have scientific and technical bibliographic resources specialised in the different areas of polytechnic knowledge that support all the degrees of the university (http://bibliotecnica.upc.edu). UPC physical collections include copies of monographs (104.263), magazine collections (1,852) and other serialised publications (962). They also have electronic resources that support network learning and research: online books (34,767), online journals (17,831), final degree thesis/online dissertations (48,106) and databases (184).

Evidence E.4.3.11 provides data about the use and satisfaction by FIB students of the collections, spaces and equipment and services offered by the library. It reports an overall satisfaction of 5.1 (on a grading scale from 1 to 6, where 6 means "totally agree").

The library service has adapted its services, opening hours and conditions of use throughout the different stages of the pandemic (see COVID Libraries19 webpage). All on-line services have been reinforced and, where possible, the library has been opened with the necessary health measures in place.

UPC Commons

The institutional repository (see E.4.3.14) stores magazine articles, research reports, participation in conferences by UPC research staff members, final degree projects of UPC students, academic materials and past exams from UPC teaching staff.

More than 3,300 FIB academic works are classified and preserved at UPCommons, including final degree projects of the programmes to be accredited (see E.4.3.12). The specific report on FIB academic works shows the main features from this documentary set (see E.4.3.13).

Financial resources

UPC is a public Spanish university and is funded by the national and regional governments (see legal framework). Public universities are owned by the state but they still have a considerable level of independence when it comes to self-government. Public universities are subject to Spanish administrative law, just as any other public body within the state. Most of the public university staff, lecturers and professors have the status of civil servants, which means having tenure.

Spanish universities continue to face economic restrictions, which began in 2008 in a context of economic crisis that lasts to this day. The most significant fact is that Catalonia devotes 0,715% of its GDP to universities, while the EU-22 average is 1,27% (E.4.3.15, "Comparación entre comunidades autónomas en España, Europa y la OCDE, 2009-2015" report, December 2017). The FIB community has coped with this situation coinciding with the deployment of the new EHEA degrees, which means important teaching demands related to the rising number of students and ECTS (E.0.1.3). Recent years of recession and a decrease in investments are partially offset by fundraising through collaboration with companies.

The UPC budget (see E.4.3.16) is managed at two levels: a centralised budget and a delegated budget for each school and department. The UPC central administration manages the centralised budget. This budget includes the teaching and support staff salaries, major investments and financial operations for all the universities.

The schools are provided with a delegated budget for some current expenses like teaching and lab materials. Additionally, schools are allowed to keep a share of particular incomes, such those frome educational cooperation agreements or classroom rental. The FIB Standing Committee approves the budget, which is published in the annual report.

The next table shows the evolution of FIB budget:

Closed Budget					Budget approved
	2016	**2017**	**2018**	**2019**	**2020 (*)**
Incomes	305,246.06 €	303,301.42 €	347,195.87 €	380,771.53 €	391,212.11 €
Expenses	274,187.93 €	226,385.58 €	323,023.98 €	304,143.27 €	391,212.11 €
(*) 2020 budget hasn't been closed yet					

These are the three main income accounts for the FIB delegated budget:
 - FIB receives an allocation as one of the UPC schools for current expenditures. The next tables show allocations of the most recent years. Government's austerity measures brought about annual decreases in the allocations from 2012 until 2016:

	2012	2013	2014	2015	2016
FIB Allocation (euros)	196,46.,26	125,739.69	89,795.15	88,148.00	88,046.57

This decrease has been partially reverted during the last four years:

	2017	2018	2019	2020
FIB Allocation (euros)	101,994.52	108,181.22	122,991.50	134,237.11

- Educational Cooperation Agreements establish a tax for university management that was partly yielded to FIB in the last years:

	2017	2018	2019	2020
ECA (euros) - budget projected incomes	95,000.00	12,000.00	120,000.00	130,205.37
Current incomes		137,071.65	177,645.13	

- In the last few years, FIB received over 20,000 euros from renting spaces such as classrooms and common places (for example, the TechTalent training centre) as well as 14,185 € from the FIB bar fee.

FIB 2020 initial budget approved expenses include:

	2020
Ordinary expenses	73,000.00
FIB omputer Labs (A5, B5, C6)	25,000.00
Other Teaching Laboratories material	12,000.00
Teaching Material	12,000.00
inLab FIB	7,000.00
Grants	59,000.00
ICT investments	115,000.00
Others	88,212.11

Investments

The school invests over 80.000 € yearly in ICT equipment that is complemented by UPC annual programmes to renew equipment. FIB initial budget for 2020 allocated 115,000 € to ICT investments that were completed with:

- 28,000 € (*"Convocatòria de renovació Equipament Docent 2020"*, UPC annual programme to renew learning equipment).
- 8,950 € ("*Pla TIC 2020*", UPC annual programme to renew IT equipment).

In addition to the above mentioned regular incomes and expenses, FIB has other incomes for specific investments: industry funding programmes and governmental (national or international) funding programs. For example: AGAUR grants (International Master's programme for MEI, MIRI and MAI), specific projects (FIB Visiona, inLab Talent, inLab crowdfunding), industry donations (Everis, Google ,Social Point).

COVID-19 specific investments and funds (2020)

COVID-19 special investments for the school have been carried out thanks to extra assignment of:

- 60,000 € from FIB budget.
- 45,908.00 € from the UPC programme to install hybrid classrooms to support COVID-19 situation ("*Dotació aules multimèdia als centres UPC curs 2020-21*").
- 32,057.44 € from UPC special COVID-19 funds to improve online learning.

UPC has also assigned specific funds for the school to improve support for first year students:

- 7,500 € for mentoring internship grants.
- 31,200 € for teaching student assistance.

5. Transparency and Documentation

Relevant and readily accessible information to all stakeholders

The FIB website (E.0.1.1) ensures easy and universal access to all relevant stakeholders. Pertinent information related to FIB degree programmes is completed and up to date at this website.

In 2017, the new FIB website was launched with the aim of providing a more modern and responsive website (adaptable to different devices) with a more visual design. In addition, the information was reorganised to improve user experience. It provides public and complete information, published entirely in Catalan and mostly in English and Spanish.

Additionally, a continuous work of information is carried out through the different social networks of the centre (Facebook, YouTube, Twitter, Instagram), which we use to disseminate the news and the most relevant facts related to the FIB and its community and studies.

For the enrolled students in each degree programme, there exists a specific website: evidence E.5.0.1 for GEI and evidence E.5.0.2 for Masters. It includes the information on the specific organisation (syllabus, faculty, final or thesis project, exams, timetables, calendar). The information is updated before the start of the academic year and much of the teaching information is brought up to date each semester. Maintenance and information issues are dealt with on a daily basis.

Enrolled students also have access to different intranets for some undisclosed information. One of those intranets allows them to access their registration and produce official certificates (we call it *e-Secretaria*), and it is handled by UPC. Another two intranets offer them access to the virtual classrooms: one is hosted by UPC (see E.5.0.3, ATENEA, an adaptation of Moodle Course Management System) and the other by the FIB (see E.5.0.4, Racó, an ad hoc platform developed by FIB IT service). Both incorporate various educational tools adapted to the implementation of degrees within the EHEA (alerts, notes, calendars and assignments).

Additionally, the school also relies on other channels to offer information on its degrees and its functioning:

- MediaFIB: video-publishing and live event broadcasting platform, used for the publication of teaching videos associated with syllabus, promotional videos and live broadcast of the school events (E.5.0.5). Operational until 2018, it has been subsequently replaced by the FIB YouTube channel.
- Institutional YouTube channel: audiovisual platform for the broadcast and publication of videos associated with the studies and the streaming of live events (E.5.0.6).
- Information screens in the public spaces of the FIB: information points in public areas of large influx of people, such as computer rooms and the FIB building and its square, in order to publish the most relevant news of the school.
- Social networks: updated information about the FIB through the Twitter (E.5.0.7), Facebook (E.5.0.8) and Instagram (E.5.0.9) channels.
- The point of contact implemented in 2011 for reporting technical issues has been extended since 2019 to all areas. It is a tool (for the FIB community it is an intranet) to optimise all the processes involved in responding to queries and/or incidents informed through electronic means such as email, online forms, etc., which have significantly increased. This personalised point of contact for telematic consultations aims to optimise resources and increase the responsiveness of the organisation. Moreover, it tries to avoid the following problems encountered: recurrent queries and/or incidents addressed to different areas, resources repeatedly allocated due to a same query sent to several areas, and no having user feedback on the status of the query while it is being resolved (E.5.0.10).

- An open contact form for inquiries, suggestions, complaints and compliments that is accessible from the FIB homepage.

The process of programme monitoring and, where applicable, accreditation of degree programmes for the UPC is available at the UPC VSMA website (E.5.0.11, which in Catalan means *Verificació Seguiment Modificació Acreditació*, that is, verification, monitoring, modification and accreditation of degree programmes). The FIB outcomes of programme monitoring are available at that website as well as at FIB QAS (evidence E.0.1.11), the School Quality system).

The section The school in figures on the website (evidence E.0.1.4) shows the main indicators of the FIB as well as the annual academic results (in Catalan, see Annual reports), while the aggregate indicators of academic results and satisfaction of the centre can be consulted through the UPC's corporate data management and analysis system (E.0.1.10). These indicators complement those offered on the page of each degree, facilitating consultation by all stakeholders. UPC Rankings website (E.0.1.5) also reports on the positioning of the FIB in the main world university rankings.

Regarding the 270.1.2.6 process, Management of incidents, complaints and suggestions of the School's SIGQ, it guarantees the receipt of incidents. These will be recorded, if applicable, informed, analysed and solved based on transparency and efficiency by the school's management team. At all events, the school greatly appreciates any suggestion, complaint or compliment. From the website, one can access the forms enabled to receive incidents (E.5.0.10).

Criterion 5.1 Module descriptions

The publication of syllabus on the FIB website provides students with the information to determine what is intended to learn, how it will be assessed and the expected workload of the subject.

The syllabus tool integrated in Racó allows:

- Head of Academic Studies: to validate changes introduced by teacher/module coordinator, report changes and post/publish at the website. They assign which competences are going to be evaluated in GEI subjects and offer different and integrated views of subjects to help coordination.
- Subject coordinators: to introduce the following information by using a specific tool:
  - subject website, with additional information
  - teaching method(s) and workload (weekly hours)
  - intended learning outcomes (module objectives)
  - content
  - planned activities and evaluation activities
  - competences (choosing which competences of the degree are going to be developed in the subject)
  - previous capacities
  - form(s) of assessments and details explaining how the subject mark is calculated
  - basic and complementary recommended literature
  - COVID-19 Addendum (temporary modifications and measures due to COVID-19)
  - planned use/applicability
  - support for Catalan, Spanish and English

Teaching guides are public and accessible to all students and teaching staff and they present the following information:

- module identification name
- teachers and subject coordinator
- link to the module website with additional information, if any
- teaching method(s) and workload (weekly hours)
- credit points
- module type (compulsory, elective)
- intended learning outcomes (module objectives)
- module content
- planned activities and evaluation activities
- competences
- planned use/applicability
- admission requirements
- form(s) of assessments and details explaining how the module mark is calculated
- basic and complementary recommended literature with links to the library
- COVID-19 Addendum (showing how COVID-19 measures can change any previous point)

Syllabus are available in Catalan, Spanish and English.

Concerning publication, the date is kept internally. Syllabus are also stored in the Academic Information System for each semester. Therefore, students can get from e-Secretaria the syllabus of the subjects they have done in the proper semester.

Exemples: MIRI Syllabus | FIB - Barcelona School of Informaticspc.edu

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Criterion 5.2 Diploma and Diploma Supplement

At the end of each evaluation period, an automatic process checks the academic records of the students and closes the academic file of those who meet the requirements of graduation and are entitled to request the degree certificate.

Additionally, students who finish their credits at another time during the semester can request to check and close their academic files so that they can ask for the degree certificate.

At their request, they receive a receipt in order to pay the application fees of the diploma. When we receive electronic confirmation of the payment from the bank, FIB issues a certificate of the achievement of the degree and the payment to obtain the diploma.

A sample of the graduation certificate, diploma supplement and transcript of records are available at E.2.1.11 ("Diploma sample" folder with restricted access).

Criterion 5.3 Relevant rules

For enrolled students in each degree programme, there exists a specific website: evidence [E.2.1.3] for GEI and evidence (E.2.1.4) for Masters. It includes the information on the specific organisation (syllabus, faculty, final or thesis project, exams, timetables, calendar). The information is updated before the academic year starts and much of the teaching information is brought up to date each semester. Maintenance and information issues are dealt with on a daily basis.

There is an academic regulations section on the website of the Barcelona School of Informatics for each degree (E.5.3.1 for GEI, E.5.3.2 for MEI, E.5.3.3 for MIRI and E.5.3.4 for MAI). Regulations are reviewed according to QAS process 270.1.1.1.

6. Quality Management: Quality Assessment and Development

> **Criterion 6 Quality management: quality assessment and development**

FIB has among its main goals the continuous quality assurance of all of its academic programmes. Some years ago, the adaptation to the EHEA system was considered an opportunity to design an internal Quality Assurance System (QAS), which was defined and accredited in June 2009 along the Program AUDIT framework in accordance with the AQU guidelines, also in compliance with the principles of legality, publicity, transparency and participation (E.0.1.11). Since then, the actual implementation of the QAS has evolved relying upon the established internal organisational and academic structure of the FIB, which is composed of the appropriate set of academic bodies and decision units. Therefore, the entire FIB governance structure (E.0.1.5), where a numerous group of students, teaching and management staff participate, is used to perform the school QAS in a distributed and coordinated manner rather than in a single unit, dealing with all issues related to the quality assurance of all the academic programmes provided by FIB. In this way, the analysis and decision-making processes undertaken are considered appropriate for enabling each programme outcomes to be accomplished. Thus, FIB processes are repeated in a continuous, regular and formal way, mostly every academic year or semester, and some others in longer periods of time.

The dean's staff and governing bodies are in charge of generating, monitoring, assessing and supplying documentary evidence for all the processes. FIB staff carries out the different tasks and minutes of the bodies' meetings are regularly reported to the target groups. The public results of all these operational procedures bring about transparency to all these guided processes with continuous improvement plans. This way of working follows the QAS-designed processes as they were initially designed and accredited. Consequently, their main purpose has spread and evolved throughout the long period since the original QAS was proposed while the different governing bodies have been adapting to the new conditions (new programmes, activities, members and governing styles)d. This evolution makes FIB's typical work flexible, versatile and adaptive.

However, in the last two years and in addition to the ad hoc programmes accreditation a new accreditation alternative has arisen, both at the Spanish and at the Catalan level. This new option is called "institutional accreditation", and instead of accrediting every single university programme provided by a school through the official external processes known as programme verification (for new programmes) and programme accreditation (for already existing programmes), the implementation of the internal QAS becomes the main target of accreditation, with a formal QAS process-based evaluation of the school running.

Along with that recent alternative, the current dean's staff believes that it will be more appropriate and convenient for the near future of the FIB to be prepared for such institutional accreditation. That entails a quick adjustment to the functioning of our governing bodies, not only to the spirit and to purposes of the accredited QAS, but also and more explicitly to its formal concepts and processes. In the other way round, we also have to adapt the formal QAS description to any particular functioning of our governing bodies that was not explicitly depicted in our current QAS manual.

Furthermore, in July 2017 the creation of the new administrative unit called UTG CNTIC that is shared with another UPC school and with some UPC departments was approved. Although such a new unit started in 2019, some of its processes involving FIB have not been fully defined until very recently, which has involved major organisational changes among support staff. For this reason, the present dean's staff also believes that there is room for reviewing and improving the QAS, so it was ready for addressing an improvement action during the second half of its first mandate. Unfortunately, that period has experienced the enormous impact of the COVID-19 pandemic, which led to carry out urgent actions to tackle the situations triggered that still are being addressed by the dean's staff. Consequently, once the impact caused by COVID-19 has been addressed we will be finishing the review of all our quality assurance processes. Afterwards, it will be presented to the School Board and the Standing Committee for their approval, and eventually, to the UPC quality and evaluation unit called GPAQ for its formal accreditation.

Concerning the basic FIB governance, the dean (as the highest executive authority), the dean's staff and the governing bodies, that is, the School Board and the Standing Committee, which perform executive functions, currently carry out the governance of the FIB. Decision-making processes based on continuous improvement processes rely on the School Board, with a minimum of two annual meetings, and on the Standing Committee, the FIB's executive body that meets twice a month. Regulations and minutes of these meetings are public (in Catalan, School Board minutes and Standing Committee minutes), and they follow a plan-do-check-act periodic cycle between the dean's staff, and principally, the Standing Committee.

Each degree programme has its own specific academic committee: CAGEI, CAMEI, CAMIRI and CAIMAI. Other specific bodies are: a general Academic Committee, three Curricular Committees, an Internal Assessment Committee, which is established for verification and accreditation processes, and a Quality Committee, with members from outside the FIB, set for a more institutional and cross-disciplinary purpose.

As stipulated by the laws of public universities in Spain and the relevant regulations set up at UPC and FIB, all FIB members (students, teaching and support staff) regularly run for the election of the School Board and the Standing Committee by following the procedures of the Regulations of the FIB. Besides, most of the other committee members are elected, few of them being directly appointed by the dean. The regulations and up-to-date composition of all these committees are public (E.0.1.5, School Governance).

The Quality Assurance System public information

According to the commitment of transparency required for university institutions in the framework of the EHEA, universities must have and follow policies and systems of internal quality assurance. Therefore, the FIB's internal Quality Assurance System (QAS) has been formally established and published (evidence (E.0.1.11, the School Quality system).

A mandatory annual management report of the dean's staff is presented to the School Board with the information, organisation and agreed measures of the corresponding semesters. QAS processes are evaluated according to the last academic year and new proposals are presented. Particular mention must be made of the annual accountability, which can be found in the Academic Report. FIB presents annual Academic Reports and Management Reports to the School Board and they are public at the website (in Catalan, see E.4.3.8 FIB Annual Report 2018-2019 -all the annual reports are available at E.1.0.2-, and see E.6.0.2 FIB Management Report 2019-2020 -all the management

reports are available in the School Board webpage). The monitoring reports, the accreditation reports and the verifications reports of the degrees taught by the FIB are presented in the quality section of the school website (E.0.1.11).

The QAS and degree programmes design

The School Board is the collegial body with the highest authority over internal regulations as well as over the control and statement of the position and aims of the school. Therefore, it is the QAS body in charge of programme design final approval. It is on the FIB School Board where the implementation of the AUDIT assurance of programme quality relies. From the degree programme design in the EHEA framework, the process evolved by FIB defining ad hoc expert committees that take into account stakeholders' needs prior to degree design approval.

The QAS and degree programmes monitoring

All the FIB governance bodies are related to monitoring processes, but the Standing Committee (CP, in Catalan *Comissió Permanent*) is the body that specifically ensures continuous enhancement of programme quality through the regular data analysis prepared by FIB's staff and presented by the dean. The educational programme quality assurance process produces monitoring reports (with modifications, reverification, if needed), which are approved by both the Standing Committee and eventually the School Board.

FIB has also a Quality Committee, with a more institutional and cross-disciplinary opinion purpose, whose composition also includes external personnel of the FIB: two UPC staffl not assigned to FIB, and one non-UPC staff who comes from firms related to informatics. The monitoring process, consisting in one ordinary meeting per year, gathers information and presents it to the *Comissió de Qualitat* (CQUAL). New improvement proposals are delivered to the Standing Committee when needed.

The QAS and degree programmes accreditation

Overall, all the FIB governance bodies are also related to any accreditation process of a FIB degree programme. However, for every particular accreditation project an ad hoc committee is set for that purpose. The *Internal Assessment Committee* (CAI) is the internal assessment committee responsible for the Self-Assessment Reports that any accreditation process entails, both for a single or a cluster of programs, together with the local AQU Catalan university quality agency. Latterly, the international agency ASIIN, as facilitated by AQU for the accreditation of our programmes with regard to the Euro-Inf labels, has also been involved. In this way, FIB makes every effort to adapt to the accreditation procedure proposed by AQU in accordance with ASIIN, consisting of an ad hoc process that is undertaken every 4 or 6 years, dependent on the programme level.

For such a project, once the relevant information is prepared by FIB's staff and analysed by the dean's staff and the rest of academic bodies it is gathered at "*Grups*" *Comitè d'Avaluació Interna de la FIB* (CAI),

The QAS and degree programmes results

The Standing Committee is the executive body and holds bimonthly meetings. Two of these sessions, usually in the spring and autumn seasons, are called to coincide with the two corresponding School Board meetings. A compilation regarding information, outcomes (particularly learning outcomes), including stakeholder satisfaction, is presented at those meetings. Collecting and analysing outcomes is another key AUDIT process whose implementation at FIB relies on several sources from FIB, UPC and external agents, but more specifically on a Business Intelligence tool developed at FIB (called in Catalan "*Quadre de Comandament*"). That tool collects the most important FIB data, being used by the academic committees for each degree programme.

It should be recalled that the Standing Committee feeds on specific academic bodies. Each degree programme has its own specific body: CAGEI as the GEI Academic Committee, CAMEI as the MEI Academic Committee, CAMIRI as the MIRI Academic Committee, and CAIMAI as the MAI Academic Committee. The information for each specific committee meeting is gathered at "*Grups*" CAGEI, CAMEI, CAMIRI and CAIMAI.

Regarding the process to collect and analyse outcomes, it is important to highlight that it ends up in the presentation of the relevant results (grades by subjects, teaching surveys, etc.) to the bimonthly meetings of the Standing Committee that gather information at "*Grups*" *Comissió Permanent (CP)*. Minutes and outcomes from the meetings are published at the website (in Catalan, *Actes de les reunions i documents generats (CP)*, _E.0.1.13_ Governance).

In addition to the collection and analysis of programmes performance information undertaken at FIB level, other important information is collected and shared with the school by the UPC cross-disciplinary processes implemented at the UPC administrative unit devoted to the management of academic planning and quality (GPAQ). That unit provides FIB and its governing bodies not only with some pivotal internal information such as student teaching surveys, but also with important external information, which allows FIB to compare the results of its programmes with those of other UPC schools. Moreover, external institutions such as AQU also facilitate the outcomes of other Catalan, Spanish and international universities.

In general, the dean's staff at FIB estimates that the school has plenty of varied and detailed information on the performance results of its programmes. This is possible thanks to both information systems and internal tools as well as similar information tools and external systems run by the GPAQ and other units at UPC, or even by some outside our university (e.g. AQU). Oftentimes, the challenge is essentially to decide how to integrate those miscellaneous information sources into a formal and homogeneous way that enables us to present and share them at the appropriate levels to the different governing bodies of our school.

The QAS and continuous improvement processes

The continuous improvement processes concern all the governing bodies at FIB, but the dean's staff is who is in charge of improvement actions and plans, in collaboration with specific programme committees (CAGEI, CAMEI, CAMIRI, CAIMAI). All minutes and outcomes from the collegial body meetings are published at the website. Additionally, the annual Monitoring Report (a mandatory report with improvement plans presented to the Standard Committee) and the annual Academic

Report (a mandatory management report of the dean's staff presented to the School Board) are also published (in Catalan, see Annual reports).

Finally, the dean's periodic election is a natural regulated process for a more detailed re-examination of needs, goals, objectives, outcomes, educational processes, resources, partnerships, and management system. The final mandatory management report of the dean's staff together with the annual management reports displays the decision-making history.

FIB's current dean's staff believes that the above-mentioned QAS reviewing effort will bring our school not just a future chance to present to an institutional accreditation, but also the possibility to reconsider in a critical way the various processes undertaken by the governing bodies in order to gain any potential improvement in the management of our school. In fact, to carry out such an improvement action was a planned goal for the second half of the dean's staff first mandate (courses 2019/20 and 2020/21), also as a way to be prepared for the current accreditation project.
Unfortunately, that period has experienced the enormous impact of the COVID-19 pandemic, which led to carry out urgent actions to tackle the situations triggered that still are being addressed by the dean's staff.

However, instead of just delaying the QAS review effort to be carried out after the current accreditation project we have decided to address it and try to complete it while preparing for it as a way of making greater use of the CAI team's cooperative work. We expect that after the present accreditation project the QAS review effort will help us to adapt and improve the running of the school so that we will eventually be ready for a future institutional accreditation of FIB.

Furthermore, QAS is currently being adapted and completed to integrate changes derived from the reorganisation of functions that the creation and deployment of the new UTG CNTIC administrative unit entails as well as to improve all the processes. Communication and transparency in relation to the FIB quality system will also be reviewed.

As a matter of fact, and directly connected with the further revision and formalisation of FIB's QAS, our university is currently undertaking an "Institutional Accreditation" project at an university level with AQU, where two other schools participate on a pilot-test status. When preparing for the accreditation, UPC invited FIB to participate in the pilot project but FIB dean's staff deemed it more appropriate to avoid participating and to wait for its outcomes and the lessons that could be learnt. That decision was based on different reasons, such as the difficult COVID-19 context, the challenges that came along with the new UTG CNTIC unit, and the requirements that planning those programmes and an international accreditation project demand.

The current dean's staff at FIB has decided to commit to a project in order to be prepared for a future "Institutional Accreditation" once the UPC pilot project is finished, which is expected to happen at the end of the current academic year (July 2021). Thus, we have included this commitment as a key improvement action, to be carried out as soon as the COVID-19 urgent situation is over.
On the other hand, the complete review of our QAS (as part of action [270.M.495.2016]) is being done at the same time that the UPC pilot project, so both actions could be finished simultaneously.

D. Continuous improvement process

Continuous improvement process assessment

Monitoring process performed improvement plans, some of them already finished and some others still in progress. The current analysis in the accreditation process performs new improvement plans for each degree programme.

Below we summarise the suggested changes and the status of the old and new improvement plans for each degree programme.

Bachelor degree (GEI)

Degree	Source of change	Suggested change	Status
GEI	Monitoring Report	M.482.2016. Consolidate English taught subjects	Partially done
GEI	Monitoring Report	M.483.2016. Possible GEI double specialisation	Done
GEI	Monitoring Report	M.494.2016. Review of TFG between GEI pathways	Done
GEI	Monitoring Report	M.497.2016. Improve performance of new incoming students	Done. New FIB improvement plan [M.516.2021] to enhance support strategies
GEI	Monitoring Report	M.499.2019.Review of cybersecurity subjects in GEI	Done

New improvement plans for GEI degree programme concern:
- Increasing interest for research among GEI students [M.515.2021].
- Enhancing support strategies at GEI to increase the efficiency rate even more [M.516.2021].

Masters' degrees (MEI, MIRI, MAI)

Master	Source of change	Suggested change	Status
MEI,MIRI, MAI	Monitoring Report	M.486.2016. Renaming some subjects (MEI, MIRI, MAI)	Done
MEI, MIRI,MAI	Monitoring Report	M.500.2018. Increase the amount of enrolled students at masters	Done
MEI, MIRI,MAI	Monitoring Report	M.503.2018. Improve innovation and collaboration with companies in Masters	Done

New improvement plans for all masters degrees:
- Opening research opportunities for master students [M.520.2021].

Master	Source of change	Suggested change	Status
MEI	Monitoring Report	M.485.2016.Study the implementation of a dual master programme	Done. New FIB improvement plan [M.521.2021] about Dual Master MEI programme verification
MEI	Monitoring Report	M.498.2019. Reduce overlaps between GEI and MEI subjects	Done

New improvement plans for MEI degree programme concern:
- Dual Master MEI programme verification [M.521.2021].

Master	Source of change	Suggested change	Status
MIRI	Monitoring Report	M.487.2016. MIRI reorganisation of semesters and contents of compulsory courses	Done
MIRI	Monitoring Report	M.488.2016. MIRI: find a mechanism to recognise courses taken in previous undergraduate studies	Done
MIRI	Monitoring Report	M.489.2016. Creation of more seminars for MIRI	Done
MIRI	Monitoring Report	M.501.2019. MIRI: Review CPDS common compulsory subject	Done

New improvements plans for MIRI degree programme concern:
- MIRI: Adaptations derived from the new Data Science Master. [M.518.2021].

Master	Source of change	Suggested change	Status
MAI	Monitoring Report	M.490.2016. MAI: recognise credits from other programs	Done
MAI	Monitoring Report	M.491.2016 MAI: new intensifications	Done
MAI	Monitoring Report	M.492.2016. MAI: review structure and contents of existing intensifications	Done
MAI	Monitoring Report	M.493.2016. MAI: change the mandatory nature of the subject Intelligent data analysis applications in business. Improvement plan	Done
MAI	Monitoring Report	M.502.2019 MAI: Reduce issues related with mobility to URV campus	Partially done

New improvements plans for MAI degree programme concern:
- Increasing collaboration with the Barcelona Supercomputing Center and other research centres [M.519.2021].

Cross-disciplinary or common changes

Degree	Source of change	Suggested change	Status
GEI, MEI, MIRI, MAI	Monitoring Report	M.448.2016.Website upgrade	Done. New improvement plan about new promotional actions [M.511.2021]
GEI, MEI, MIRI, MAI	Monitoring Report	M.484.2016.New double degree agreements	Done. New improvement plan for new double degree agreements within the UNITE consortium. [M.510.2021]
GEI, MEI, MIRI, MAI	Monitoring Report	M.481.2016. QAS revision and implementation	Done
GEI, MEI, MIRI, MAI	Monitoring Report	M.495.2016. Implement entirely the QAS review process	In progress. QAS is being updated to include UTG CNTIC organisation and to improve processes. Due on March 2021
GEI, MIRI, MAI	Monitoring Report	M.504.2018. Pre-enrolment of optative subjects	In progress
GEI, MEI, MIRI, MAI	Monitoring Report	M.505.2019. New application to manage incoming mobility students	In progress, nearly finished.
GEI, MEI, MIRI, MAI	Monitoring Report	M.506.2017. Consolidate inLab FIB and its Talent Program	Done
GEI, MEI, MIRI, MAI	Exceptional COVID-19 situation	M.507.2020. COVID-19 actions	In progress

New improvement plans:
- Integration of the external practices in the new UPC Applications [M.508.2021].
- Reviewing external practices regulations and implementation [M.522.2021].
- Improvements to GEI, MEI, MIRI and MAI based on future changes of the Computer Curricular of the ACM [M.509.2021].
- New Double degrees agreements within the UNITE consortium and other potential partners in all masters and GEI [M.510.2021].
- New promotional actions to increase the number of applicants [M.511.2021].
- Reviewing FIB strategy for online/blended/hybrid learning [M.512.2021].
- Reviewing FIB BYOD strategy [M.513.2021].
- Reviewing mobility agreements according to the future Erasmus+ programme [M.514.2021].
- Introducing gender perspective as a cross-disciplinary competence in GEI, MEI, MIRI and MAI [M.521.2021].

Improvement plans

This is included as ANNEX 1.

E. Evidences

Title	Address
E.0.1.1 FIB Website	https://www.fib.upc.edu/en
E.0.1.2 The school in figures webpage	https://www.fib.upc.edu/en/fib/school/school-figures
E.0.1.3 FIB main figures and facts Llibre de dades FIB	https://gpaq.upc.edu/lldades/quadrecomandament.asp?codiCentre=270
E.0.1.4 UPC ranking webpage	https://www.upc.edu/ranquings/ca/posicions-de-la-upc-als-principals-ranquings
E.0.1.5 School Governance	http://www.fib.upc.edu/en/centre/govern.html
E.0.1.6 FIB Staff	https://www.fib.upc.edu/en/fib/school/staff
E.0.1.7 UTG CNTIC Structure	https://utgcntic.upc.edu/ca/estructura
E.0.1.8 inLab FIB	https://inlab.fib.upc.edu/en
E.0.1.9 FIB Departments	https://www.fib.upc.edu/en/research/departments
E0.1.10 FIB Research	https://www.fib.upc.edu/en/research
E.0.1.11 FIB quality system information (English version) (Catalan version)	https://www.fib.upc.edu/en/fib/quality-system https://www.fib.upc.edu/ca/la-fib/sistema-de-qualitat
E.0.1.12 Accreditation process (Quality system) (Catalan version)	https://www.fib.upc.edu/en/fib/quality-system/accreditation-process https://www.fib.upc.edu/ca/la-fib/sistema-de-qualitat/acreditacions
E.0.1.13 Minutes and outcomes from the School board and the Standing committee	https://www.fib.upc.edu/ca/la-fib/la-facultat/govern
E.1.1.1 GEI website	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering
E.1.1.2 GEI Main figures and facts	https://gpaq.upc.edu/lldades/centres.asp?codiCentre=270&codiTitulacioDursi=GRAU00000407&nomCentre=Facultat%20d%27Inform%C3%A0tica%20de%20Barcelona&nomTitulacio=Grau%20en%20Enginyeria%20Inform%C3%A0tica&cursIniciTitulacio=2010-2011&numCredits=240&tipusEnsenyament=Grau&codiFC=
E.1.1.3 MEI website	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering
E.1.1.4 MEI Main figures and facts	https://gpaq.upc.edu/lldades/centres.asp?codiCentre=270&codiTitulacioDursi=DGU000001058&nomCentre=Facultat%20d'Inform%C3%A0tica%20de%20Barcelona&nomTitulacio=M%C3%A0ster%20en%20Enginyeria%20Inform%C3%A0tica&numCredits=90&tipusEnsenyament=M%C3%A0ster%20universitari&codiFC=
E.1.1.5 MIRI website	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics
E.1.1.6 MIRI Main figures and facts	https://gpaq.upc.edu/lldades/centres.asp?codiCentre=270&codiTitulacioDursi=DGU000001097&nomCentre=Facultat%20d'Inform%C3%A0tica%20de%20Barcelona&nomTitulacio=Erasmus%20Mundus%20Master's%20degree%20in%20Innovation%20and%20Research%20in%20Informatics%20(MIRI)&numCre

	dits=120&tipusEnsenyament=M%C3%A0ster%20universitari&codiFC=
E.1.1.7 MAI website	https://www.fib.upc.edu/en/studies/masters/master-artificial-intelligence
E.1.1.8 MAI Main figures and facts	https://gpaq.upc.edu/lldades/centres.asp?codiCentre=270&codiTitulacioDursi=DGU000001164&nomCentre=Facultat%20d'Inform%C3%A0tica%20de%20Barcelona&nomTitulacio=M%C3%A0ster%20en%20Intel%C2%B7lig%C3%A8ncia%20artificial%20(Pla%202012)&numCredits=90&tipusEnsenyament=M%C3%A0ster%20universitari&codiFC=
E.1.1.9 Spanish University System	https://www.euroeducation.net/prof/spainco.htm
E.1.1.10 Master website	http://www.fib.upc.edu/en/masters.html
E.1.1.11 Spanish Royal Decree	https://gpaq.upc.edu/sat/documents/referencia/RD%201397-2007%20modificado%20RD%20861-2010.pdf
E.1.1.12 BOE resolution 12977/2009	https://www.boe.es/boe/dias/2009/08/04/pdfs/BOE-A-2009-12977.pdf
E.1.1.13 GEI Competences	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering/curriculum/competences
E.1.1.14 GEI Competences for degree subjects (competences-subjects matrix)	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering/curriculum/competences-degree-subjects
E.1.1.15 MEI Competences	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering/curriculum/competences
E.1.1.16 MEI Competences for degree subjects (competences-subjects matrix).	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering/curriculum/competences-degree-subjects
E.1.1.17 MIRI Competences	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics/curriculum/competences
E.1.1.18 MIRI Competences for degree subjects (competences-subjects matrix).	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics/curriculum/competences-degree-subjects
E.1.1.19 MAI Competences	https://www.fib.upc.edu/en/studies/masters/master-artificial-intelligence/curriculum/competences
E.1.1.20 MAI Competences for degree subjects (competences-subjects matrix)	https://www.fib.upc.edu/en/studies/masters/master-artificial-intelligence/curriculum/competences-degree-subjects
E.1.1.21 The satisfaction of graduates from Catalan universities. AQU Survey 2020	https://estudis.aqu.cat/dades/ReportingServices/Report/ReportTemplate/319?ReportName=RptGrausCatalunyaMain&ReportDescription=RptGrausCatalunyaMain&Width=100&Height=650&tipusFiltreType=Graus
E.1.1.22 The satisfaction of graduates. A survey from 2014 to 2019.	https://www.upc.edu/portaldades/ca/enquestes/estudiantat/enquesta-de-satisfaccio-de-titulats/enquestes-de-satisfaccio-de-titulats-1/informes-historics/fib.pdf
E.1.4.1 I love bits website for prospective and new bachelor students	http://www.ilovebits.fib.upc.edu/
E.1.4.2 Masters website for prospective and new master students	http://masters.fib.upc.edu/

E.1.4.3 Access to the labour market for graduates General report 2020 (in Catalan) General report 2017 (in English) Specific Data for Bachelor's degree in Informatics (included GEI at FIB-UPC)	https://www.aqu.cat/doc/doc_42542075_1.pdf https://www.aqu.cat/doc/doc_18272729_1.pdf https://estudis.aqu.cat/dades/ReportingServices/Report/ReportTemplate/318?ReportName=RptGrausCatalunyaMain&ReportDescription=RptGrausCatalunyaMain&Width=100&Height=650&tipusFiltreType=Graus#
E.1.4.4 FIB secondary school website (in Catalan)	https://www.fib.upc.edu/secundaria
E.1.4.5 Gender equality at UPC	https://igualtat.upc.edu/ca/pla/disseny-estrategia-genere
E.1.4.6 GEI introductory support course (in Catalan)	https://www.fib.upc.edu/ca/estudis/graus/grau-en-enginyeria-informatica/matricula/curs-intensiu
E.1.4.7 GEI new students survey	https://www.upc.edu/portaldades/ca/enquestes/estudiantat/enquestees-a-lestudiantat-nou-de-primer-curs/fitxers/nous-de-1er-2019-20/enquestas_nous_201920_fib.pdf
E.1.4.8 FIB Mobility	https://www.fib.upc.edu/en/mobility
E.2.1.1 Access to the labour market for graduates 2020 (B.Sc Informatics Enginerring. AQU report)	https://estudis.aqu.cat/dades/ReportingServices/Report/ReportTemplate/318?ReportName=RptGrausCatalunyaMain&ReportDescription=RptGrausCatalunyaMain&Width=100&Height=650&tipusFiltreType=Graus#
E.2.1.2 FIB Industrial Practices	https://www.fib.upc.edu/en/companies/industrial-practices
E.2.1.3 GEI Coordination Webpage (in Catalan)	https://www.fib.upc.edu/ca/estudis/graus/grau-en-enginyeria-informatica/pla-destudis/coordinacio-del-grau
E.2.1.4 Standing Committee minutes	http://www.fib.upc.edu/fib/centre/govern/organs-colegiats/actes.html
E.2.1.7 GEI webpage	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering
E.2.1.8 GEI final degree project website	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering/degree-final-project
E.2.1.9 Criteria used in GEI bachelor's thesis assessment rubrics	https://www.fib.upc.edu/sites/fib/files/documents/estudis/initial-milestone-rubric.html
E.2.1.10 Practical Experience and Labor Experiences 2018-2021 (restricted access)	https://drive.google.com/drive/folders/1WfGLfMtugpL2KLS6PdrsgEuXBCZ0bLmg?usp=sharing
E.2.1.11 Restricted evidences (restricted access)	https://drive.google.com/drive/folders/11qTPzcLAwReVM-3ZdpUcr-V0BcnE2-TX?usp=sharing
E.2.1.12 FIB GEI graduated satisfaction survey 2018-2019	https://www.upc.edu/portaldades/ca/enquestes/estudiantat/enquesta-de-satisfaccio-de-titulats/enquestes-de-satisfaccio-de-titulats-1/curs-2018-2019/fib.pdf
E.2.1.13 FIB job placement survey for master's students 2020	https://www.upc.edu/portaldades/ca/enquestes/insercio-laboral/enquesta-insercio-laboral-masters/edicio-il-2020/fib.pdf
E.2.3.1 FIB student survey of 2019/2020-Q2 semester, lockdown/confinement period	https://www.upc.edu/portaldades/ca/enquestes/estudiantat/enquestes-a-lestudiantat-de-grau-i-masters-universitaris/270.pdf
E.2.4.1 Welcome guide for first-year student at FIB	https://www.fib.upc.edu/ca/estudis/graus/guia-dacollida-estudiantat-de-grau

E.2.4.2 First-year students action plan Pla d'acció tutorial FIB	https://www.fib.upc.edu/ca/estudis/graus/pla-daccio-tutorial
E.2.4.3 Peer mentoring support materials	https://ocw.upc.edu/curs_publicat/270MENT/2019/1
E.2.4.4 Peer mentoring Mentories entre iguals FIB	https://www.fib.upc.edu/ca/estudis/graus/pla-daccio-tutorial/mentories-entre-iguals
E.2.4.5 Peer academic mentoring Aula Lliure FIB	https://www.fib.upc.edu/ca/estudis/graus/pla-daccio-tutorial/aula-lliure
E.2.4.6 Conference paper AENUI2019. Results of the peer academic mentoring programme at FIB (in Spanish "Una propuesta de mentoría académica entre iguales para el Grado en Ingeniería Informática")	http://www.aenui.net/ojs/index.php?journal=actas_jenui&page=article&op=view&path%5B%5D=495
E.2.4.7 DEFIB website	http://defib.upc.edu/
E.2.4.8 FIB Associations	https://www.fib.upc.edu/en/fib/university-life/associations
E.2.4.9 Responsible for inclusion web page	https://inclusio.upc.edu/ca/compromis-upc/responsables-dinclusio/responsables-dinclusio
E.2.4.10 Third UPC Gender Equality Plan 2016-2020	https://igualtat.upc.edu/ca/shared/third-upc-gender-equality-plan.pdf
E.2.4.11 Sexual harassment information (in Catalan)	https://igualtat.upc.edu/ca/drets/assetjament
E.2.4.12 Industrial Practices	http://www.fib.upc.edu/en/empresa/practiques/estudiant.html
E.2.4.13 FIB job bank	http://www.fib.upc.edu/en/empresa/borsa.html
E.2.4.14 FIB VIsiona	https://fibvisiona.com/en
E.2.4.15 FIB Alumni	https://www.fibalumni.net/
E.2.4.16 UPC Alumni	https://alumni.upc.edu/ca
E.3.0.1 Academic regulations for degree and master's students at UPC	https://www.upc.edu/sga/ca/shared/fitxers-normatives/AcademicRegulations_EN/NAGRAMA/acord-prorroga-nagrama-20-21_en_definitiu.pdf
E.3.0.2 FIB Exams regulations (in Catalan)	https://www.fib.upc.edu/sites/fib/files/documents/actes/propostareglamentexamensqualificacions.pdf
E.3.0.3 FIB Protocol on fraudent acts (in Catalan)	https://www.fib.upc.edu/sites/fib/files/documents/actes/protocol_fraus_actes_avaluacio_cp.pdf
E.3.0.4 UPCcommons repository of exams	https://upcommons.upc.edu/handle/2117/134985
E.3.0.5 GEI exams calendar	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering/exams
E.3.0.6 MEI exams calendar	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering/exams
E.3.0.7 MIRI exams calendar	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics/exams
E.3.0.8 MAI exams calendar	https://www.fib.upc.edu/en/studies/masters/master-artificial-intelligence/exams
E.4.1.1 GEI Academic Staff	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering/faculty

E.4.1.2 MEI Academic Staff	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering/faculty
E.4.1.3 MIRI Academic Staff	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics/faculty
E.4.1.4 MAI Academic Staff	https://www.fib.upc.edu/en/studies/masters/master-artificial-intelligence/faculty
E.4.1.5 FIB scientific production of UPC researchers	http://futur.upc.edu/FIB
E.4.1.6 Project participation of UPC academic staff (restricted access)	https://drive.google.com/drive/folders/1hwEuu7Qc4Y19TfGEk1G6EMjcBp6Xkpp1?usp=sharing (restricted)
E.4.1.7 FUTUR UPC Researchers' Scientific Production Portal	https://futur.upc.edu/mapes_coneixement
E.4.1.8 Bibliometric Studies	https://bibliotecnica.upc.edu/en/brgf/serveis/estudis-bibliometrics
E.4.1.9 Comparative study of scientific publication in the field of computer science at the UPC vs. other national and international universities (2007-2017)	http://hdl.handlhttp://hdl.handle.net/2117/22885e.net/2117/22885
E.4.1.10 recerTIC UPC - Computer security	https://bibliotecnica.upc.edu/brgf/serveis/estudis-bibliometrics/estudi-comunicacio-cientifica-upc-computer-security
E.4.1.11 recerTIC UPC - Machine learning	https://bibliotecnica.upc.edu/brgf/serveis/estudis-bibliometrics/estudi-comunicacio-cientifica-upc-machine-learning
E.4.1.12 recerTIC UPC - Bioinformatics	https://bibliotecnica.upc.edu/brgf/serveis/estudis-bibliometrics/estudi-comunicacio-cientifica-upc-bioinformatics
E.4.1.13 recerTIC UPC - Data science and engineering	https://bibliotecnica.upc.edu/brgf/serveis/estudis-bibliometrics/estudi-comunicacio-cientifica-upc-data-science-engineering
E.4.1.14 recerTIC UPC - Robotics	https://bibliotecnica.upc.edu/brgf/serveis/estudis-bibliometrics/estudi-comunicacio-cientifica-upc-robotics
E.4.2.1 ICE website	https://www.ice.upc.edu/ca/professorat-upc/formacio-continuada/formacio-per-a-la-docencia
E.4.2.2 ICE courses 2016-2019, Academic FIB participation, English courses 2016-2019 (Restricted access)	https://drive.google.com/drive/folders/1-wsGiv4Oa2RIXfrssTwOnuPxsj0LKeDV?usp=sharing
E.4.2.3 Staff training and development (in Catalan)	https://www.upc.edu/sdp/ca/formacio-del-pas
E.4.3.1 FIB students satisfaction survey 2016-2017	https://www.upc.edu/portaldades/ca/enquestes/estudiantat/enquestes-de-satisfaccio-als-estudiants-acreditacio-titulacions/2016-2017/270_01.pdf
E.4.3.2 FIB Academic staff satisfaction survey 2017-2018	https://www.upc.edu/portaldades/ca/enquestes/pdi/2017-18/fib.xlsx
E.4.3.3 FIB Masters postgraduates satisfaction survey 2018-2019	https://www.upc.edu/portaldades/ca/enquestes/estudiantat/enquesta-de-satisfaccio-de-titulats/titulats-de-master/2018-19/fib.pdf
E.4.3.4 FIB staff satisfaction survey 2017-2018	https://www.upc.edu/portaldades/ca/enquestes/pas/enquestes-de-satisfaccio-al-pas

E.4.3.5 Teaching Classrooms	https://www.fib.upc.edu/en/fib/rooms/teaching-classrooms
E.4.3.6 Campus Nord Hybrid Classrooms	https://www.fib.upc.edu/en/fib/it-services/campus-nord-hybrid-classrooms
E.4.3.7 FIB Computer Labs	https://www.fib.upc.edu/en/fib/rooms/computer-labs
E.4.3.8 FIB Annual Report 2018-2019	https://www.fib.upc.edu/sites/fib/files/documents/fib/memoria-2018-2019-definitiva-br.pdf
E.4.3.9 FIB IT Services	https://www.fib.upc.edu/en/fib/it-services
E.4.3.10 FIB Teaching laboratories	https://www.fib.upc.edu/en/fib/rooms/teaching-laboratories
E.4.3.11 Library survey of FIB students for academic year 2018/19	https://www.upc.edu/portaldades/ca/enquestes/biblioteques/informes/2018-19/centres/fib.pdf
E.4.3.12 FIB Academic Works	https://upcommons.upc.edu/handle/2099.1/1441
E.4.3.13 Report on FIB Academic Works deposited in UPCcommons	https://bibliotecnica.upc.edu/en/brgf/serveis/treballs-academics-fib
E.4.3.14 UPCommons. Research & Knowledge UPC website	https://upcommons.upc.edu/
E.4.3.15 University System Observatory	https://www.observatoriuniversitari.org/es/files/2017/11/Quien-financia-la-universidad.pdf
E.4.3.16 UPC Budget for 2021	https://www.upc.edu/ca/la-upc/la-institucio/fets-i-xifres/pressupost
E.5.0.1 GEI website	https://www.fib.upc.edu/en/studies/bachelors-degrees/bachelor-degree-informatics-engineering
E.5.0.2 Masters website	http://www.fib.upc.edu/en/masters.html
E5.0.3 Atenea	https://www.upc.edu/atenea/servei-atenea
E.5.0.4 Racó	https://raco.fib.upc.edu/cas/login?locale=en_US
E.5.0.5 Media FIB channel	http://media.fib.upc.edu/fibtv/
E.5.0.6 YouTube channel	https://www.youtube.com/user/mediafib
E.5.0.7 FIB Twitter	https://twitter.com/fib_upc
E.5.0.8 FIB Facebook	https://www.facebook.com/fib.upc
E.5.0.9 FIB Instagram	https://www.instagram.com/fib.upc/
E.5.0.10 Custom point of contact for the FIB community	https://peticions.utgcntic.upc.edu
E..5.0.11 VSMA website	http://www.upc.edu/seguimentdetitulacions

E.5.0.12 FIB website of the school's quality system	https://www.fib.upc.edu/en/fib/quality-system https://www.fib.upc.edu/ca/la-fib/sistema-de-qualitat
E.5.3.1 GEI Academic Regulations (in Catalan)	https://www.fib.upc.edu/ca/estudis/graus/grau-en-enginyeria-informatica/normativa-academica
E.5.3.2 MEI Academic Regulations	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering/academic-regulations
E.5.3.3 Academic Regulations for MIRI master Thesis	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics/academic-regulations
E.6.0.1 FIB QAS (in Catalan, current approved version)	https://www.fib.upc.edu/sites/fib/files/documents/fib/270.saiq.pdf
E.6.0.2 FIB Management report 19-20 (approved at School Board))	https://www.fib.upc.edu/sites/fib/files/documents/actes/jf20201216_p4_informegestio_19-20_v3.pdf
E.I.2 Spanish Computer Olympic	https://olimpiada-informatica.org/
E.I.3 FIB MEI Industrial Modality	https://www.fib.upc.edu/en/studies/masters/master-informatics-engineering-industrial-modality
E.I.4 FIB MIRI ADSDB	https://www.fib.upc.edu/en/studies/masters/master-innovation-and-research-informatics/curriculum/syllabus/ADSDB-MIRI
E.I.5 FIB MIRI seminars	https://raco.fib.upc.edu/seminaris/GestioAlumnesSeminaris
E.I.6 FIB Covid-19 Support Catalan version	https://www.fib.upc.edu/en/date-information-about-covid-19 https://www.fib.upc.edu/en/academic-year-2020-2021 https://www.fib.upc.edu/ca/seguiment-pla-dactuacio-covid-19 https://www.fib.upc.edu/ca/curs-2020-2021
E.I.7 UPC Covid-19 Support Catalan version	https://www.upc.edu/en/covid-19-portal https://bibliotecnica.upc.edu/biblioteques-durant-crisi-covid-19 https://www.upc.edu/ca/portalcovid19/portalcovid19

Annex 1. Improvement Plans

Past plans

270.M.447.2016	**Increase knowledge and interest of computer engineering profession**	
	Responsible:	Vice-dean for Promotion and Communication
	Source:	Past accreditation
	Standard:	Standard 1: Quality of the training programme
	Purpose:	To boost the knowledge and social recognition of the studies and the profession of computer engineering
	Re-verification?:	No
	Objectives:	To promote and collaborate in initiatives which aim to promote the role of information tech.
	Actions:	It seeks to tighten and expand contact with secondary schools to promote a better understanding of the profession and the scope of studies in computer science engineering, and to take the opportunity to influence especially the feminine group
	Indicators:	Number of secondary schools contacted and number of girls interested.
	Scope:	FIB
	Priority:	Medium
	Term:	25/11/2017
	State:	Completed
	Actions taken:	An specific website has been created as a tool of direct communication, more attractive and informative, to the targeted stakeholders: secondary schools and girls. Specific activities have been organized.
	Results:	The specific website shows the different promotion actions performed regularly: - Related to Girls: ICT Girl's Day, International Women's Day, Women's and little girl's Science Day - Promote Castor tests in high schools to drive Computational Thinking (Bebras) in elementary and secondary school. The FIB supports the implementation in the centers of the competitions, distributes materials, etc. - Several visits to centers and open days have

been performed. - Partner of Spanish Computer Olympics. FIB has locally organized them several times.

270.M.478.2016	**Website upgrade**	
	Responsible:	Dean's team
	Source:	Past accreditation
	Standard:	Standard 1: Quality of the training programme
	Purpose:	FIB website has to be the tool of communication more attractive and informative to the targeted stakeholders.
	Re-verification?:	No
	Objectives:	To adapt website to the latest technological developments. To review the aesthetic website aspects to improve information and satisfaction.
	Actions:	
	Indicators:	Check list (actual and new information) to verify. Computer and mobile access.
	Scope:	FIB
	Priority:	High
	Term:	25/11/2016
	State:	Completed
	Actions taken:	A committee has started to define actual and new information to cover. Website has been adapted so that it can be seen from different devices (responsive design), several changes have been done of aesthetics to give the information in a more agile way and that they are found more easily. For instance, a special master promotional website (evidence ….) has been done to help potential new incoming master students to find the more relevant information, group information in the different studies in the same structure to help FIB students to quickly find information, special direct promotion information has been added to high school, etc.
	Results:	Responsive website with updated content. A new improvement plan has been planned.

	QAS revision and implementation	
	Responsible:	Vice-dean of Quality
	Source:	Past accreditation
	Standard:	Standard 3: Efficacy of the programme's internal quality assurance system
	Purpose:	To review QAS processes and to standardise and to allow flexibility.
	Re-verification?:	No
	Objectives:	To standardise rules and regulations dealing with formal communication and exchange of information between governing bodies and with target groups.
	Actions:	Review QAS processes.
	Indicators:	Number of processes standardised.
270.M.481.2016	**Scope:**	FIB
	Priority:	Medium
	Term:	25/11/2017
	State:	Completed
	Actions taken:	Standardisation of rules and regulations dealing with formal communication and exchange of information between governing bodies and with target groups.
	Results:	Each degree programme has its own specific academic body: CAGEI, CAMEI, CAMIRI and CAIMAI. Other specific bodies are: a general Academic Committee, three Curricular Committees, an Internal Assessment Committee, established for verification and accreditation processes, and a Quality Committee. All the FIB governance bodies are concerned with monitoring processes, but the Standing Committee (CP in Catalan, Comissió Permanent) is the body that specifically ensures continuous enhancement of programme quality through the regular data analysis as prepared by FIB's staff and presented by the Dean. In order to assure that the information is exchanged between governing bodies and with target groups, a mandatory yearly management report of the Dean's team is presented to the School Board with the information, the organisation and decided measures of the corresponding semesters. QAS processes are evaluated according to the last academic year, and new proposals are presented. FIB presents annual Academic Reports to the School Board and they are public at the website.

Consolidate English taught subjects

Responsible:	Vice-dean/Head of Studies and CAGEI
Source:	Past accreditation
Standard:	Standard 1: Quality of the training programme
Purpose:	Number of students interested in subjects taught in English decreases because it's not useful to accredit third language. So a new incentive is necessary.
Re-verification?:	No
Objectives:	To increase students enrolling English taught subjects by adding an internationalisation mention for students with minimum 25% of ECTS of subjects taught in English.
Actions:	Introduce subjects taught in English.
Indicators:	Number of English taught subjects and number of students for internationalisation mention.
Scope:	Degree programme: Grau en Enginyeria Informàtica
Priority:	Medium
Term:	25/11/2017
State:	Completed
Actions taken:	One subject in English has been introduced at all levels of the compulsory subjects. Elective subjects in English have also been introduced. Promotion of special training for academical staff.
Results:	Despite having at least one subject in English at all levels of the compulsory subjects we were not able to do the same in the specialities (students objected that if there was only one group, it would be in English). Now we are focused on electives, where we have 40% of subjects in English (8 out of 20). On the other hand, special formation has also been done to promote English among our academic staff at ICE (49 courses from 2016). A minimum 25% of ECTS of subjects taught in English cannot be guaranteed, and because of this, introducing a new internationalization mention has been discarded by now.

270.M.482.2016

	Possible GEI double specialisation
	Responsible: Vice-dean/Head of Studies and CAGEI
	Source: Past accreditation
	Standard: Standard 6: Quality of programme outcomes
	Purpose: To allow double specialisation with minimum number of over ECTS.
	Re-verification?: Sí
	Objectives: Students could reach a double specialisation identifying groups of subjects to share.
	Actions: Updating and approval of the corresponding regulations.
270.M.483.2016	**Indicators:** Define the feasible double specialisations and the subjects implied.
	Scope: Degree programme: Grau en Enginyeria Informàtica
	Priority: Low
	Term: 25/11/2018
	State: Completed
	Actions taken: The corresponding regulations have been updated after approval by the Academic Committee of the degree.
	Results: GEI students can reach a double specialization performing enough credits of two specializations at GEI studies. This means that the Faculty opens the possibility for students to certify two mentions (instead of one) at the time of getting the bachelor degree.

	New double degree agreements	
	Responsible:	Vice-dean/Head of Studies, Vice-dean of Postgraduates Studies and CAGEI, CAMEI, CAMIRI, CAMAI
	Source:	Past accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need to promote student's mobility in both senses.
	Re-verification?:	Sí
	Objectives:	Evaluate the suitability and implementation details of double diploma agreements with foreign institutions.
	Actions:	Review and update the double degree agreements.
270.M.484.2016	**Indicators:**	Number of new contacts and number of agreements.
	Scope:	FIB / EPSVG
	Priority:	High
	Term:	25/11/2016
	State:	Completed
	Actions taken:	Double degree agreements have been reviewed.
	Results:	We have updated, renewed and extended the double degrees with ISIMA, PUCP, CIC-IPN, Politecnico de Torino. Also, we are evaluating the new definitions of the computer curricular in order to study which double degree can benefit MEI studies to integrate some specific areas. We plan to increase double degrees within the UNITE consortium in a new improvement plan.

Study the implementation of a dual master programme

	Responsible:	Vice-dean of Postgraduated Studies and CAMEI
	Source:	Past accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	A dual master programme allows students to combine seamlessly their jobs and master through a tight collaboration between the companies and the university.
	Re-verification?:	Sí
	Objectives:	Evaluate the suitability and implementation details of a dual master programme.
	Actions:	Study the impact of implementing a dual master programme for MEI. Contact interested companies. New regulations of the recognition of labour experience.
270.M.485.2016	**Indicators:**	Check UPC regulations and possibilities of implementing such a programme.
	Scope:	Degree programme: Màster universitari en Enginyeria Informàtica
	Priority:	Low
	Term:	25/11/2018
	State:	Completed
	Actions taken:	We have studied the impact of implementing a dual master programme for MEI. We have contacted companies with interest in doing a tight collaboration through our vice-dean of institutional and international relations and direct contacts in the FIB Visiona forum. Also, we have implemented a pseudo-dual master visualizing the Industrial itinerary at MEI, which is a step towards the dual version of MEI and has had a good impact in the interest of GEI students. This step forward also includes new regulations of the recognition of labor experience and elective external curricular experience.
	Results:	We plan to formalize those tight collaborations and design and re-verificate a DUAL programme.

270.M.486.2016	**Renaming some subjects (MEI, MIRI, MAI)**	
	Responsible:	Vice-dean of Postgraduated Studies and CAMEI CAMIRI and CAIMAI
	Source:	Past accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need to update names of subjects, according to current terminology in the area of research.
	Re-verification?:	No
	Objectives:	To Adapt the names of the subjects to current terminology in the area of research.
	Actions:	Modify the name of some subjects of MEI, MIRI and MEI studies.
	Indicators:	Number of changed names
	Scope:	FIB
	Priority:	Medium
	Term:	25/11/2017
	State:	Completed
	Actions taken:	There have been modifications of names of subjects and specializations at MAI, MEI and MIRI. All of them in order to adapt the names to current terminology in the area of research.
	Results:	Modifications of names of subjects and specializations at MAI, MEI and MIRI done, according to current terminology in the area of research.

MIRI reorganization semesters and contents of compulsory courses	
Responsible:	Vice-dean of Postgraduated Studies and CAMIRI
Source:	Past accreditation
Standard:	Standard 6: Quality of programme outcomes
Purpose:	First semester compulsory courses are very crowded in the first semester and almost empty in the second semester.
Re-verification?:	No
Objectives:	To balance the number of students, we want to evaluate the possibility to move some compulsory courses for some specialties to the second semester without affecting the learning outcomes.
Actions:	Move some compulsory courses for some specialties to the second semester without affecting the learning outcomes.
Indicators:	Number of compulsory courses that can be moved.
Scope:	Degree programme: Master's degree in Innovation and Research in Informatics (MIRI)
Priority:	Medium
Term:	25/11/2017
State:	Completed
Actions taken:	Compulsory courses at MIRI have been distributed based on the number of students and academic criteria. All changes have been done in coordination with the CAMIRI and the specialization coordinators.
Results:	More balanced number of students between the two semesters..

(Row label: **270.M.487.2016**)

MIRI: find a mechanism to recognise courses taken in previous undergraduate studies

Responsible:	Vice-dean of Postgraduates Studies and CAMIRI
Source:	Past accreditation
Standard:	Standard 6: Quality of programme outcomes
Purpose:	Compulsory courses in the master were planned for graduate students that have previously finished a Bachelor in Computer Engineering. Now, the master attracts students from neighbouring areas that have already taken similar courses but they would benefit from taking more computer engineering fundamental courses. We want to find a mechanism so that any student can have a personalised set of compulsory courses so that we can guarantee their proficiency in all the areas covered by the initially planned compulsory courses.
Re-verification?:	No
Objectives:	Reduce the amount of redundant courses for students coming from other Bachelor degrees than Computer Engineering.
Actions:	Creation of electives subjects in order to facilitate the background formation of students.
Indicators:	Evaluation of the legal framework and experience in other masters at UPC.
Scope:	Degree programme: Master's degree in Innovation and Research in Informatics (MIRI)
Priority:	Low
Term:	25/11/2018
State:	Completed
Actions taken:	Creation of an elective subject to help those with lack of algorithms, data structures and databases, which are advised to do instead of only-programming courses of GEI.
Results:	This has been low priority. However, in order to facilitate the background formation, more close to the needs of the different specializations, we have created an elective subject to help those with lack of algorithms, data structures and databases, which are advised to do instead of only-programming courses of GEI

270.M.488.2016

	Creation of more seminars for MIRI
	Responsible: Vice-dean of Postgraduated Studies and CAMIRI
	Source: Past accreditation
	Standard: Standard 6: Quality of programme outcomes
	Purpose: To offer to the students more seminars to obtain a wider knowledge on the hot topics of research.
	Re-verification?: No
	Objectives: In order to have enough seminars for the students there is a need on promoting the creation of new seminars among the local and visiting professors.
	Actions: To create a Special SIRI seminar management section in Racó. Organization of seminars.
270.M.489.2016	**Indicators:** Number of students and number of current and new seminars.
	Scope: Degree programme: Master's degree in Innovation and Research in Informatics (MIRI)
	Priority: Low
	Term: 25/11/2018
	State: Completed
	Actions taken: An special SIRI seminar management section has been created in Racó. Organization of seminars.
	Results: Special SIRI seminar management dedicated web at MIRI studies has been created. In this site the current and past seminars are published. Also, new documentation and promotion of research and collaboration with institutes and departments have also been done. In fact, state of the art, reports and other collaboration works, in addition to online workshops, tutorials, conferences has been promoted with special communication so that students could have a large number of opportunities from the beginning of the pandemic.

270.M.490.2016	**MAI: recognise credits from other programs.**

Responsible:	Vice-dean of Postgraduates Studies and CAIMAI
Source:	Past accreditation
Standard:	Standard 1: Quality of the training programme
Purpose:	The modern master academic programs should allow flexibility to adapt to the academic needs of students.
Re-verification?:	No
Objectives:	Give options to students to delve into issues not offered by the program.
Actions:	Allow students to take up [9..12] ECTS from other programs Official Master.
Indicators:	Number of credits and subjects.
Scope:	Degree programme: Màster's degree in Artificial Intelligence
Priority:	Medium
Term:	25/11/2017
State:	Completed
Actions taken:	Credits recognition in MAI has been reviewed.
Results:	Students are now allowed to take up to 10% of the MAI ECTS credits (9 ECTS) from other programs Official Master, after approval of CAIMAI and the coordinator of MAI and the other official master.

MAI: new intensifications

Responsible:	Vice-dean of Postgraduates Studies and CAIMAI
Source:	Past accreditation
Standard:	Standard 6: Quality of programme outcomes
Purpose:	It has been identified the need of new intensifications: Data Science, and Assistive Technologies and Care Services. These new intensifications aims to train students in the intelligent processing of large volumes of data, and to prepare students for the development of smart technologies and services in health care, as well as research in the field of disability and mHealth.
Re-verification?:	Yes
Objectives:	To update the Master's academic contents in an emerging area in research and the market.
Actions:	Definition of the new intensifications with existing and new subjects.
Indicators:	To define the new intensifications with existing and new subjects.
Scope:	Degree programme: Màster's degree in Artificial Intelligence
Priority:	High
Term:	25/11/2016
State:	Completed
Actions taken:	We have adapted some of the intensifications: Vision, Perception & Robotics has passed to be Vision, Perception & Robotics. Assistive Technologies, Computational Intelligence has been transformed to Data Science and Computational Intelligence, Professional Practice to Hot Topics in AI & Professional Practice.
Results:	New intensifications include training for students in the intelligent processing of large volumes of data, and to prepare students for the development of smart technologies and services in health care, as well as research in the field of disability and mHealth with the following subjects.

270.M.491.2016

MAI: review structure and contents of existing intensifications

	Responsible:	Vice-dean of Postgraduates Studies and CAIMAI
	Source:	Past accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	To review structure and contents of existing intensifications.
	Re-verification?:	Yes
	Objectives:	To update and share subjects, extend subject number of credits, update format and contents.
	Actions:	Provide a mechanism to update the contents of the Master and not to lose the pulse of the development of the professional issues in the area
270.M.492.2016	**Indicators:**	Contents of the Master updated.
	Scope:	Degree programme: Màster's degree in Artificial Intelligence
	Priority:	High
	Term:	25/11/2016
	State:	Completed
	Actions taken:	Contents of MAI instensification has been reviewed.
	Results:	New intensifications include training for students in the intelligent processing of large volumes of data, and to prepare students for the development of smart technologies and services in health care, as well as research in the field of disability and mHealth with the following subjects: Cognitive Robotics, Assistive and Health-Care Technologies, Human Language Engineering, Big Data Analytics, Minds, Brains and Machines, Deep Learning, NLP over open linked data, Artificial Intelligence in HealthCare, New Trends in Robotics and Supervised Learning and CBR.

	MAI: change the mandatory nature of a subject	
	Responsible:	Vice-dean of Postgraduates Studies and CAIMAI
	Source:	Past accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	The change is necessary to ease the academic structure of the program.
	Re-verification?:	Yes
	Objectives:	To change the mandatory nature of the subject Intelligent data analysis applications in business.
270.M.493.2016	**Actions:**	Review mandatory nature of the subject Intelligent data analysis applications in business.
	Indicators:	The mandatory nature of the subject Intelligent data analysis applications in business changed.
	Scope:	FIB
	Priority:	Low
	Term:	25/11/2018
	State:	Completed
	Actions taken:	Mandatory nature of a subject reviewed.
	Results:	The mandatory nature of the subject of Intelligent Data Analysis Application in Business has been changed.

270.M.494.2016	**Review of TFG between GEI itineraries of FIB and EPSVG**

Responsible:	Vice-degana de qualitat
Source:	Past accreditation
Standard:	Standard 1: Quality of the training programme
Purpose:	In the GEI itinerary, the number of ECTS of the Final Degree Project of the FIB does not coincide with that of the Politechnic School of Engineering of Vilanova i la Geltrú.
Re-verification?:	Yes
Objectives:	Review of TFG between GEI itineraries of FIB and the Politechnic School of Engineering of Vilanova i la Geltrú.
Actions:	Review of TFG between GEI itineraries
Indicators:	TFG between GEI itineraries reviewed
Scope:	Degree programme: Grau en Enginyeria Informàtica
Priority:	High
Term:	15/9/2017
State:	Completed
Actions taken:	Meetings with the management team of the Politechnic School of Engineering of Vilanova i la Geltrú.
Results:	This action was performed for the itinerary of GEI implemented by the Politechnic School of Engineering of Vilanova i la Geltrú.

Full implementation of QAS

Responsible:	Vice-dean of Quality
Source:	Past accreditation
Standard:	Standard 3: Efficacy of the programme's internal quality assurance system
Purpose:	Accreditation.
Re-verification?:	No
Objectives:	Implement entirely the QAS review process.
Actions:	To review all of our quality assurance processes and to establish a more homogeneous protocol for standardising rules and regulations.
Indicators:	QAS review process implemented.
Scope:	FIB
Priority:	High
Term:	15/9/2017
State:	In process
Actions taken:	In July 2017 the creation of the new administrative unit called UTG CNTIC was approved, that was fully started in 2019. This has involved major organizational changes among support staff. Although such a new unit started in 2019, some of its processes involving FIB have not been fully defined until very recently, which has involved major organisational changes among support staff. For this reason, the present dean's staff also believes that there is room for reviewing and improving the QAS, so it was ready for addressing an improvement action during the second half of its first mandate. Unfortunately, that period has experienced the enormous impact of the COVID-19 pandemic, which led to carry out urgent actions to tackle the situations triggered that still are being addressed by the dean's staff. Consequently, once the impact caused by COVID-19 has been addressed we will be finishing the review of all our quality assurance processes. Afterwards, it will be presented to the School Board and the Standing Committee for their approval, and eventually, to the UPC quality and evaluation unit called GPAQ for its formal accreditation. Communication and transparency about the FIB quality system will also be reviewed.

The scope row label **270.M.495.2016** appears in the left column.

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270.M.497.2016	**Improve performance of new incoming students**	
	Responsible:	Vice-dean/Head of Studies
	Source:	Past accreditation
	Standard:	Standard 5: Effectiveness of learning support systems
	Purpose:	Some students have more difficulty getting through the initial phase of studies.
	Re-verification?:	No
	Objectives:	Reinforce Introductory courses, re-evaluation, tutorship, mentorship (pair to pair with 4th-year students) and academic mentorship (Aula Lliure) programs.
	Actions:	Reinforce introductory courses. Extend the number of subjects that do re-evaluation. Reinforce tutoring programs.
	Indicators:	Number of students participating in the introductory courses, re-evaluation and tutorial programs. Dropout rate of the studies. Satisfaction level of the participating students.
	Scope:	FIB
	Priority:	Medium
	Term:	12/2/2023
	State:	Completed
	Actions taken:	Introductory courses, re-evaluation, tutorship, mentorship (pair to pair with 4th-year students) and academic mentorship (Aula Lliure) programs have been reinforced to improve performance of new incoming students, in particular those coming from higher degree training cycles (CFGS in catalan). As the number of students coming from those studies have decreased in the last years (now less than 5%), less introductory courses are now offered. Nevertheless, they are also useful to improve some students' background. As for re-evaluation, it has been extended to 7 out of the 8 first-year subjects. Mentorship programs have been launched after the previous accreditation process. Tutorship addressed to students obtaining bad academic results and to those with special educational requirements has been enhanced.
	Results:	As a result of all these measures, the dropout rate has been reduced from the last review.

Reduce overlaps of the subjects between GEI and MEI

Responsible:	Vice-dean/Head of Studies and Vice-dean of Postgraduates Studies
Source:	Monitoring
Standard:	Standard 6: Quality of programme outcomes
Purpose:	Possible overlaps of the subjects between GEI and master subject's syllabus
Re-verification?:	No
Objectives:	Reduce overlaps of the subjects between GEI and MEI
Actions:	To do a study to analyse which students the master's degree should focus on.
Indicators:	Satisfaction level of MEI students.
Scope:	Degree programme: Màster universitari en Enginyeria Informàtica
Priority:	Low
Term:	12/2/2024
State:	Completed
Actions taken:	We have reviewed subjects looking at the possible overlaps of the subjects between GEI and master subject's syllabus. This has been done in coordination with the faculty and with the academic committees. In the case of the MEI, a study has been done to analyse which students the master's degree should focus on.
Results:	One output result of this analysis is that in the case that a student comes from Computer Engineering Specialization at GEI's degree, a different itinerary, based on projects, is done for some subjects which may have some overlaps with advanced specialized subjects in MEI. Another output of this analysis has been that the orientation of some of the MEI subjects have been upgraded so that they can be more attractive to MEI students that come from GEI at FIB or other Engineering degrees at UPC or other European Universities.

270.M.498.2019

Review of cybersecurity subjects in GEI

270.M.499.2019	**Responsible:**	Vice-dean/Head of Studies
	Source:	Monitoring
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need to deal with emerging technologies and main cybersecurity problems of companies.
	Re-verification?:	No
	Objectives:	Review of cybersecurity subjects in GEI to deal with emerging technologies and main cybersecurity problems of companies.
	Actions:	To introduce a new elective subject on Cybersecurity Management.
	Indicators:	Satisfaction level of graduates. Satisfaction level of companies.
	Scope:	Degree programme: Grau en Enginyeria Informàtica
	Priority:	Medium
	Term:	12/2/2023
	State:	Completed
	Actions taken:	A new elective subject on Cybersecurity Management was introduced to deal with emerging technologies and main cybersecurity problems of companies. Existing subject on Computer Security was also reviewed to focus more on applications, examples and tools.
	Results:	Cybersecurity subjects in GEI reviewed.

	Increase the amount of enrolled students at masters

270.M.500.2018	**Responsible:**	Vice-dean of Postgraduates Studies
	Source:	Monitoring
	Standard:	Standard 1: Quality of the training programme
	Purpose:	Low demand to enrol to master's degrees.
	Re-verification?:	No
	Objectives:	Increase the amount of enrolled students at masters.
	Actions:	Participating in international meetings. Direct promotion actions to GEI students. Changing the admission periods.
	Indicators:	Number of enrolled students at masters.
	Scope:	FIB
	Priority:	Medium
	Term:	12/2/2023
	State:	Completed
	Actions taken:	In order to increase the amount of enrolled students at masters different promotional actions have been done as participating in international meetings, direct promotion to GEI students, and changing the admission periods.
	Results:	In the case of MIRI the amount enrolled students have been increased up to 77 students (last review the maximum was 61). In the case of MAI, the number of candidates have increased significantly up to being for more than 500% the number of available slots. However, the number of final enrolled students is still less than the available slots. We are studying why and there is an action plan for that. Finally, for MEI, the number of students depends on the year being 25 (2016-2017), 24, 20, 18 and about 20 students last year (2020-2021), although the number of candidates has also increased and being more than 145% the number of available slots the year with 18 enrolled (up to 205% in 2017/18 and only 105% on 2016 when there were more registered). In the case of MEI there has been a special promotion to GEI students of the industrial itinerary plan, which is a step towards the dual version of MEI.

	MIRI: Review CPDS common compulsory subject	
	Responsible:	Vice-dean of Postgraduates Studies
	Source:	Monitoring
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Improvement in the subject
	Re-verification?:	No
	Objectives:	Review CPDS subject
	Actions:	Modularize the content of the CPDS subject.
270.M.501.2019	**Indicators:**	CPDS subject survey
	Scope:	Degree programme: Master's degree in Innovation and Research in Informatics (MIRI)
	Priority:	Medium
	Term:	12/2/2023
	State:	Completed
	Actions taken:	Review CPDS subject
	Results:	CPDS, common compulsory subject at MIRI, has been modularized so that there is an introductory part to give an overview of basic concepts, and then, based on the background and interest of the first-year students they can go into more detail in two out of the three modules: Concurrency, parallelism and distributed systems.

MAI: Reduce issues related with mobility to URV Campus

Responsible:	Vice-dean of Postgraduates Studies
Source:	Monitoring
Standard:	Standard 5: Effectiveness of learning support systems
Purpose:	Issues received in relation to mobility to URV Campus, located in Tarragona (south of Catalonia and 100 Km from Barcelona).
Re-verification?:	No
Objectives:	MAI: Reduce issues related with mobility to URV Campus
Actions:	Study and transparently explain in the promotion actions to MAI candidates.
Indicators:	Satisfaction level of students.
Scope:	Degree programme: Màster's degree in Artificial Intelligence
Priority:	Low
Term:	12/2/2024
State:	Completed
Actions taken:	MAI Mobility to URV at Tarragona (south of Catalonia and 100km from Barcelona): Schedules are made and designed so that mobility to this Campus is one single day. It has been studied and transparently explained in the promotion to MAI candidates. We have shown in the promotions to students that mobility from Barcelona is 1h or 1h: 15 minutes by train, which is the time some students living in one corner from Barcelona may have to come to the campus. However, we are conscious that the transportation has a cost, and there are some subjects that have made some movement to the UPC Campus Nord. However, professors that may teach in URV other subjects cannot do this movement to Barcelona. Even so, some teachers have made that effort and with Covid19 it was decided from the beginning to do everything online to reduce overall mobility.
Results:	Issues have been reduced but after Covid 19 period, this should be reviewed.

270.M.502.2019

	Improve innovation and collaboration with companies in Masters	
	Responsible:	Vice-dean of Postgraduates Studies
	Source:	Monitoring
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need for improvement.
	Re-verification?:	No
	Objectives:	Improve innovation and collaboration with companies in Masters.
	Actions:	To Include new elective subjects in the master studies.
270.M.503.2018	**Indicators:**	Number of collaborations with companies in Masters.
	Scope:	FIB
	Priority:	Medium
	Term:	12/2/2023
	State:	Completed
	Actions taken:	New elective subjects have been included in the master studies.
	Results:	New MAI subjects, recognition of other master studies subjects, curricular practical in companies and labour experience recognition, several SIRI opportunities, a new subject has been introduced in MIRI to improve the innovation part and the collaboration to companies: I2P-MIRI.

270.M.504.2018	**Pre-enrolment of elective subjects**	
	Responsible:	Vice-dean/Head of Studies and Vice-dean of Postgraduates Studies
	Source:	Monitoring
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need to improve the planning of groups to be opened to each subject
	Re-verification?:	No
	Objectives:	Implement pre-enrolment process in different subjects in GEI, MAI and MIRI to be able to better plan groups to be opened for each subject and manage the limited registration capacity of some subjects, granting a seat for those students that need to course those subjects to get a mention.
	Actions:	Implement pre-enrolment process in different subjects in GEI, MAI and MIRI.
	Indicators:	Number of subjects which pre-enrolment has been implemented. Number of complaints received during the enrolment process.
	Scope:	FIB
	Priority:	Medium
	Term:	12/2/2023
	State:	In process
	Actions taken:	Pre-enrolment process implemented in different subjects in GEI, MAI and MIRI.

270.M.505.2019	**New application to manage incoming mobility students**	
	Responsible:	Vice-dean for International Relations
	Source:	Monitoring
	Standard:	Standard 5: Effectiveness of learning support systems
	Purpose:	Need for improvement
	Re-verification?:	No
	Objectives:	To manage more efficiently application forms of mobility incoming students and deal with the acceptance workflow.
	Actions:	To develop a new application to manage application forms of mobility incoming students and deal with the acceptance workflow.
	Indicators:	Number of applications forms managed with this application.
	Scope:	FIB
	Priority:	Low
	Term:	12/2/2024
	State:	In process
	Actions taken:	The application is already been used. New functionalities have been added recently to deal with transcript of records. Therefore, the action will be finished in March 2021.

	Consolidate inLab FIB and its Talent Program	
	Responsible:	InLab Director
	Source:	Monitoring
	Standard:	Standard 5: Effectiveness of learning support systems
	Purpose:	Need to improvement.
	Re-verification?:	No
	Objectives:	To consolidate inLab FIB and its Talent Program.
	Actions:	To review and update the inLab Talent Program. To define the recognition of credits for curricular practices or no-curricular practices, following FIB regulations.
270.M.506.2017	**Indicators:**	Number of students in the InLab Talent Program.
	Scope:	FIB
	Priority:	Medium
	Term:	12/2/2023
	State:	Completed
	Actions taken:	Recognition of credits for curricular practices or no-curricular practices, following FIB regulations.
	Results:	Recognition of credits for curricular practices or no-curricular practices have been defined, following FIB regulations. inLab FIB has been accredited until 2023 as a TECNIO center by ACCIÓ, the Catalan Agency for Business Competitiveness. This process started in 2017 and involved the elaboration of a marketing and a quality plan. The Quality Management System TECNIO seal accreditation process is based on the requirements of ISO 9001 an EFQM Model.

Pandemic-related adaptation of degree programmes (Covid-19 actions)

Responsible:	Dean's team
Source:	Monitoring
Standard:	Standard 6: Quality of programme outcomes
Purpose:	Need to adapt teaching activity to the situation caused by Covid-19.
Re-verification?:	No
Objectives:	To continue with the teaching activity using online learning environments for academic and student communication.
Actions:	To adapt the teaching activity to online learning environments. To improve academic and student communications.
Indicators:	Satisfaction level of students. Academic results. Number of complains received.
Scope:	FIB
Priority:	High
Term:	12/2/2022
State:	In process
Actions taken:	There has been an adaptation to the Covid-19 situation from the very first day, continuing online classes from the following day of the lockdown situation. There has been a significant improvement in the online learning environments and support for academic and student communications. Student support has been done in several ways: - Covid-19 contact person does a personal communication with all the affected students - After full lockdown, and when the pandemic situation allows us to do some contact classes (mostly first year subjects), automatic information is provided to the responsible of the subjects to let them know about confinement situations. In this case, all teachers of the subject can daily know if they have to do hybrid classes or not. - Head of studies are in contact with responsible of the subjects to detect any issue and specialization coordinators to contact them in case of any urgent situations.

The row label for the identifier: **270.M.507.2020**

Current Plans

270.M.508.2021	**Improvement of the external academic practices and integration in the new UPC Applications**
	Responsible: Vice-dean of Enterprise relations
	Source: Accreditation
	Standard: Standard 5: Effectiveness of learning support systems
	Purpose: Adaption of new UPC regulations. Currently, the management of external academic practices is carried out in separate processes in which different applications are used.
	Re-verification?: No
	Objectives: Full integration of the external practices processes in the new UPC information systems that deal with 1) the job bank /offers for practices and with 2) the management of the curricular/non-curricular practices. These new information systems will be in production in March 2021.
	Actions: Participation of the FIB as a pilot centre.
	Indicators: Number of job / academic practices offers managed with the new UPC Application. Number of educational cooperation agreements signed.
	Scope: FIB
	Priority: High
	Term: 13/2/2022
	State: In process
	Actions taken: FIB has initiated its participation as a pilot centre. A third module is expected to be added in the near future to deal with the assessment and evaluation of external practices.

270.M.509.2021	**Improvements to GEI, MEI, MIRI and MAI based on future changes of the Computer Curricular of the ACM**	
	Responsible:	Heads of studies of GEI, vice-dean of postgraduate studies and CAGEI, CAMEI, CAMAI i CAMIRI
	Source:	Accreditation
	Standard:	Standard 1: Quality of the training programme
	Purpose:	Need for improvement due to changes of the Computer Curricular of the ACM.
	Re-verification?:	No
	Objectives:	Study of the new changes of the Computer Curricular of the ACM to upgrade GEI, MEI, MIRI and MAI. In particular, changes to MEI are expected to be done to become more attractive to GEI students with some more specialized subjects.
	Actions:	Study new changes of the Computer Curricular of the ACM to upgrade GEI, MEI, MIRI and MAI and make recommendations.
	Indicators:	ACM proposals reviewed.
	Scope:	FIB
	Priority:	High
	Term:	13/2/2022
	State:	Not started

New Double degrees agreements within the UNITE consortium and other potential partners in all masters and GEI

270.M.510.2021	Responsible:	Vice-dean of International and Industrial Relations, Heads of Studies and Vice-dean of Postgraduate Studies
	Source:	Accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need to increase mobility and internationalization of the studies.
	Re-verification?:	No
	Objectives:	Help to the mobility and internationalization of the studies. New double degrees may help making this master more specialized.
	Actions:	To contact the universities of the UNITE consortium.
	Indicators:	Number of double degrees agreements done.
	Scope:	FIB
	Priority:	Medium
	Term:	13/2/2023
	State:	In process
	Actions taken:	Contact with different universities of the UNITE consortium have been done.

	New promotional actions to increase the number of applicants
	Responsible: Vice-dean for Promotion and Communications
	Source: Accreditation
	Standard: Standard 5: Effectiveness of learning support systems
	Purpose: The confinement and mobility restrictions caused by the Covid-19 pandemic have led to the creation of new strategies to promote studies.
	Re-verification?: No
	Objectives: To create new promotional actions to increase the number of applicants.
	Actions: Development of a new set of materials. Organization of more on-line promotional actions. Creation on the web of a FAQ section covering the most common questions from past open-days and conferences. Improvements in the FIB Museum. Study the integration of bots in the FIB and UPC websites.
270.M.511.2021	**Indicators:** Number of new promotional actions done. Number of new student applications received.
	Scope: FIB
	Priority: Medium
	Term: 13/2/2023
	State: In process
	Actions taken: As promotion activities for courses 20/21 (and 21/22) have been virtualized due to pandemic mobility restrictions a new set of materials has been developed. These materials include videos explaining in a short time (about 10 minutes) the study-plan of our Computer-Science Degree, the Barcelona's Computer Science School (FIB) history, facts, numbers and staff structure, student resources available and so on. Independently a FAQ section covering the most common questions from past open-days and conferences has been developed and put on the web. With this new resources, past spring we held 8 virtual meetings with future students (about 500 attendees) that focused on attending their doubts, fears and comments. Those meetings were hosted by the vice-dean for promotion, administration staff, the dean and some students of the last courses.

	Review FIB strategy for on-line/blended/hybrid learning
	Responsible: Heads of studies
	Source: Accreditation
	Standard: Standard 6: Quality of programme outcomes
	Purpose: The experience of confinement and mobility restrictions caused by the Covid-19 pandemic leads us to review strategies of learning.
	Re-verification?: No
270.M.512.2021	**Objectives:** To improve digital learning support systems.
	Actions: Review FIB strategy for on-line/blended/hybrid learning based on the experience of the COVID-19 exceptional period.
	Indicators: Student survey (satisfaction).
	Scope: FIB
	Priority: Low
	Term: 13/2/2024
	State: Not started

270.M.513.2021	**Review FIB BYOD strategy**	
	Responsible:	Heads of studies
	Source:	Accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Improvement based on the experience of the COVID-19 exceptional period
	Re-verification?:	No
	Objectives:	To review a Bring Your Own Device Strategy for some degrees/subjects. Improvement to BYOD support systems.
	Actions:	Study introducing a Bring Your Own Device Strategy
	Indicators:	Strategy reviewed.
	Scope:	FIB
	Priority:	Low
	Term:	13/2/2024
	State:	Not started

	Review mobility agreements according to the future Eramus+ programme	
270.M.514.2021	**Responsible:**	Vice-dean for International Relations
	Source:	Accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	A new Erasmus+ programme is being prepared, leading to a review of mobility agreements.
	Re-verification?:	No
	Objectives:	To review mobility agreements according to the future Eramus+ programme.
	Actions:	Review and modify mobility agreements in accordance with the new Erasmus+ program.
	Indicators:	Mobility agreements reviewed
	Scope:	FIB
	Priority:	Low
	Term:	14/2/2024
	State:	Not started

270.M.515.2021	**Increase interest for research among GEI students**	
	Responsible:	Head of studies of GEI
	Source:	Accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Low interest of GEI students for research.
	Re-verification?:	No
	Objectives:	Increase interest for research among GEI students.
	Actions:	New elective subject in GEI to facilitate the relation between students and departments in order to increase the interest for research and networking of future graduate, master and PhD students
	Indicators:	Number of students enrolled in master and PhD programs
	Scope:	Degree programme: Grau en Enginyeria Informàtica
	Priority:	High
	Term:	14/2/2022
	State:	Not started

270.M.516.2021	**Enhance support strategies at GEI to increase the efficiency rate even more**	
	Responsible:	Head of studies of GEI
	Source:	Accreditation
	Standard:	Standard 5: Effectiveness of learning support systems
	Purpose:	Improvement.
	Re-verification?:	No
	Objectives:	Enhance support strategies at GEI to increase the efficiency rate even more
	Actions:	Improve existing support strategies at GEI.
	Indicators:	Efficiency rate.
	Scope:	FIB
	Priority:	High
	Term:	14/2/2022
	State:	Not started

270.M.517.2021	**MEI: Dual Master MEI programme verification** **Responsible:** Vice-dean of postgraduate studies and CAMEI **Source:** Accreditation **Standard:** Standard 6: Quality of programme outcomes **Purpose:** After studying the impact of implementing a dual master programme for MEI (action M.485.2016), we have planned to design and re-verificate a Dual Master MEI programme. **Re-verification?:** Yes **Objectives:** Verification of a Dual Master MEI programme. **Actions:** Verification. **Indicators:** Dual Master MEI programme verificated. **Scope:** Degree programme: Màster universitari en Enginyeria Informàtica **Priority:** Medium **Term:** 14/2/2023 **State:** Not started

	MIRI: Adaptations derived from the new Data Science Master.
	Responsible: Vice-dean of Postgraduates Studies
	Source: Accreditation
	Standard: Standard 1: Quality of the training programme
	Purpose: For MIRI studies, MIRI-DS becomes a new master called Data Science and we should analyse which are the possible updates in the common compulsory subjects to fit the new situation.
	Re-verification?: No
270.M.518.2021	**Objectives:** Analyse which are the possible updates in the common compulsory subjects for MIRI studies.
	Actions: Review the new situation fo MIRI studies: distribution among semesters, number of groups, etc.
	Indicators: Subjects adapted to the new situation.
	Scope: Degree programme: Master's degree in Innovation and Research in Informatics (MIRI)
	Priority: High
	Term: 14/2/2022
	State: In process
	Actions taken: Possible updates in the common compulsory subjects are being analysed.

270.M.519.2021	**MAI: Increase collaboration with the Barcelona Supercomputing Center and other research centers**	
	Responsible:	Vice-dean of Postgraduates Studies
	Source:	Accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Improvement
	Re-verification?:	No
	Objectives:	For MAI studies, upgrade material and collaboration with the Barcelona Supercomputing Center and other research centers to take profit of their computing facilities.
	Actions:	Meetings with the heads of BSC and other research centers to strengthen collaborations. Dissemination among MAI students of the new collaborations.
	Indicators:	Number of MAI students participating in research centers.
	Scope:	Degree programme: Màster's degree in Artificial Intelligence
	Priority:	Medium
	Term:	14/2/2023
	State:	Not started

	Open research opportunities for master students
	Responsible: Vice-dean of University-Business Relations and Vice-dean of Posgraduate Studies.
	Source: Accreditation
	Standard: Standard 6: Quality of programme outcomes
	Purpose: Need to increase the TFM orientations for master students.
	Re-verification?: No
270.M.520.2021	**Objectives:** To promote internships and work with research groups or companies.
	Actions: Create new TFM orientations.
	Indicators: Number of students in the new TFM orientations.
	Scope: FIB
	Priority: Medium
	Term: 14/2/2023
	State: Not started

	Introduce gender perspective as a transversal competence in GEI, MEI, MIRI and MAI
	Responsible: Head of Studies of GEI and Vice-dean of postgraduate studies.
	Source: Accreditation
	Standard: Standard 1: Quality of the training programme
	Purpose: A new transversal competence on gender perspective has been approved by UPC to be introduced in 2021-2022 in degrees to be accredited or verified.
	Re-verification?: No
270.M.521.2021	**Objectives:** To introduce gender perspective as a transversal competence in GEI, MEI, MIRI and MAI.
	Actions: Introduce gender perspective in the subjects of GEI, MEI, MIRI and MAI studies.
	Indicators: Number of subjects that implement the gender perspective.
	Scope: FIB
	Priority: Medium
	Term: 14/2/2023
	State: Not started

270.M.522.2021	**Review external practices regulations and implementation**	
	Responsible:	Vice-dean of University-Business Relations, Head of Studies of GEI and Vice-dean of Postgraduate Studies.
	Source:	Accreditation
	Standard:	Standard 6: Quality of programme outcomes
	Purpose:	Need of improvement
	Re-verification?:	No
	Objectives:	Integrate FIB regulations for GEI and MAI for external practices, considering curricular practices not mandatorily linked to the final project.
	Actions:	Review the existing regulations on external academic practices of the FIB and write a new regulation.
	Indicators:	New regulations for external academic places avalaible.
	Scope:	FIB
	Priority:	Medium
	Term:	14/2/2023
	State:	In process
	Actions taken:	New regulation proposal pending of approval by the corresponding governing body.

Annex 2. Actions taken due to the COVID-19 pandemic

Introduction

Given the evolution of cases of infections due to SARS-CoV-2, the competent authorities announced on Thursday, 12 March 2020 that all teaching at the university level must be carried out in a non-face-to-face format as of Monday, 16 March 2020, and for a period of 15 days.

After having considered this announcement, the UPC decided on Thursday, 12 March 2020 at 2.30 pm, to cancel face-to-face activities from Friday, 13 March 2020. Therefore, all teaching switched to a non-face-to-face mode.

In light of the situation in other countries (China and Italy), the FIB dean's staff considered that the cancellation of the face-to-face activity on campus would last a long time. Consequently, taking the necessary steps was required in order to maintain non-face-to-face teaching during a significant period of the spring semester of the 2019/2020 academic year.

The semester teaching period began on 10 February 2020, and by the time of lockdown, five teaching weeks had been completed.

Despite the fact that the cancellation of classes was an unexpected event, the professionalism demonstrated by the PDI and the FIB allowed that on Friday, 14 March 2020, just a few hours after announcing the closure of the universities, some professors were already carrying out streaming synchronous teaching using free access tools such as Twitch and Discord.

With the benefit of hindsight as well as the experience gained during this unprecedented year due to the pandemic, we can affirm that FIB has been able not only to successfully overcome the challenge but also to keep its level of quality and accuracy that characterises the training of our students.

This document summarises the actions carried out since 12 March 2020 in order to adapt the academic activity of the FIB to the pandemic situation as well as to the different situations of citizen mobility.

This information is supplemented with a series of web links that offer information to the entire FIB and UPC community (Note: The information available on the web has been updated as the situation evolved). On the other hand, we provide all the messages sent from the office of the dean at FIB to the community (students, PDI and PAS) that contain the relevant information regarding the adaptation of academic activity (E.2.1.11, COVID \ Announcement folder).

Centralised FIB information related to the situation caused by COVID-19, available at
https://www.fib.upc.edu/ca/seguiment-pla-dactuacio-covid-19 (academical year 2019-20, Catalan version)
https://www.fib.upc.edu/en/date-information-about-covid-19 (academical year 2019-20, English version)
https://www.fib.upc.edu/ca/curs-2020-2021 (academical year 2020-21, Catalan version)
https://www.fib.upc.edu/en/academic-year-2020-2021 (academical year 2020-21, English version)

Centralised UPC information related to the situation caused by COVID-19, available at
https://www.upc.edu/ca/portalcovid19/portalcovid19. (Catalan version)
https://www.upc.edu/en/covid-19-portal (English version)

FAQs of the UPC libraries during COVID-19:
https://bibliotecnica.upc.edu/biblioteques-durant-crisi-covid-19

ACTIONS AND MEASURES TAKEN IN THE SPRING SEMESTER OF THE ACADEMIC YEAR 2019/20 (March-June 2020)

Adaptation of teaching to the virtual format

- Collection of information on the adaptation of the subjects using a form (13-30 March).
- Request for changes in the course guides of the subjects and validation of the proposals; resolution of any specific incidents and doubts.
- Publication of the addenda to the course guides in the *Racó* (initially until 14 April, extended to 30 April) where students are informed of the changes that will be introduced in the subject due to the pandemic.
- Virtual campus management and *Racó* related to non-face-to-face teaching (and especially, to evaluation).
- A mechanism has been implemented for the online presentation of the bachelor and master's thesis (April 2020 call); some students have requested a postponement to July due to disease or technical support or hardware that requires attendance.
- Mid-semester examinations calendar has been rescheduled in accordance with the course coordinators.

The subjects have mainly kept the contents and have adapted the planned activities to the non-face-to-face mode. The changes in the evaluation methods have been motivated by the cancellation of evaluation tests in the period from 13/03/2020 to 03/04/2020.

All changes must be included in the addendum to the course guide to inform the students, which is published in the *Racó* for each subject (deadline 14 April, and an extension has been carried out until 30 April).

The academic calendar, schedules and exam calendar remain the same.

The number of requests for enrolment and course withdrawals (despite having increased flexibility in enrolment withdrawal periods) is similar to that of previous academic years.

		Enrolment Withdrawals		Course withdrawals	
		Requested	Approved	Requested	Approved
2019-20 (2)	Ordinary	1	0	10	7
	Extension 17/4	2	1	3	3
	Extension 30/4	2	2	7	6
	TOTAL	**5**	**3**	**20**	**16**
2018-19 (2)		**0**	**0**	**21**	**20**
2017-18 (2)		**0**	**0**	**14**	**0**

The vast majority of academic activities are carried out synchronously via streaming, with the support of GMeet (UPC deployed Google Suite Education at the end of March 2020).

Requests for supporting the students on the monitoring of non-face-to-face teaching
- 1 student with just a mobile phone → laptop lending arranged (UTG-TIC). Teachers informed that have responded. Laptop delivered Friday afternoon.
- 1 student with poor connection → the five course directors were informed. Two of them have responded.

Requests for supporting teachers on the monitoring of non-face-to-face teaching
- Acquisition and lending of digitiser tablets (approximately 15).

Impact on the development of Educational Cooperation Agreements (CCE, work placements)
- Very few withdrawals.
- All CCEs switched to teleworking.
- Resumption of formalisation of new CCEs from 13 May.
- Possibility of face-to-face CCEs when starting stage 2 of COVID-19 lockdown easing.
- Reduction of the CCEs during the period, which implies a decrease in FIB income.

Implementation of the mechanism by submitting bachelor and master's thesis online. Good performance during the exceptional period of April 2020 as well as in the presentation of the master's thesis of the master's degree in Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching.

Adaptation of the exam calendar because of the change of the university entrance examination dates and the modification of the academic calendar.

Few incidents during the development of non-face-to-face teaching. All the subjects (but one) have carried out teaching normally (given the existing context).

Evaluation and Performance

The evaluation of the spring semester of the academic year 2019-2020, both mid-semester and final examinations was carried out in a non-face-to-face format, except for the few exams taken between 10/02/2020 and 13/03/2020.

There were multiple incidents with the non-face-to-face evaluation: malfunctions in the Atenea platform and the new alternative Atenea Exams, focused on the questionnaires that use Wiris and/or LaTeX.

The greater case so far is the one related to the M2 subject (more than 300 students enrolled). An incident prevented the first mid-semester examination from being taken for 45 minutes, and during the second mid-semester examination, there were multiple incidents that have prevented an equitable mark to the students.

The students' performance in this semester has been slightly higher than the performance of previous academic years.

In E.2.1.11, COVID>Subject_Marks folder, there is a summary that includes the marks of the subjects for all the degrees in the spring semester of the academic year 2019-2020.

ICT Services and Resources

The ICT Unit of the UTG CNTIC has continued to work remotely during the lockdown period through the usual channels of online support.

FIB services provided during the lockdown period

Computer labs

- Remote access to classroom computers via "Coronabroker".
   A new ad hoc service, "Coronabroker", has been launched in a short period of time to be able to access to a PC available in the classrooms. The solution has been shared with the rest of the UPC ICT services that have adapted and implemented the same utility in other schools.
   "Coronabroker" gives remote access to 136-75 PCs (78-48 Windows, 59-24 Linux). The chart showed below corresponds to the 18/03-29/06 period.
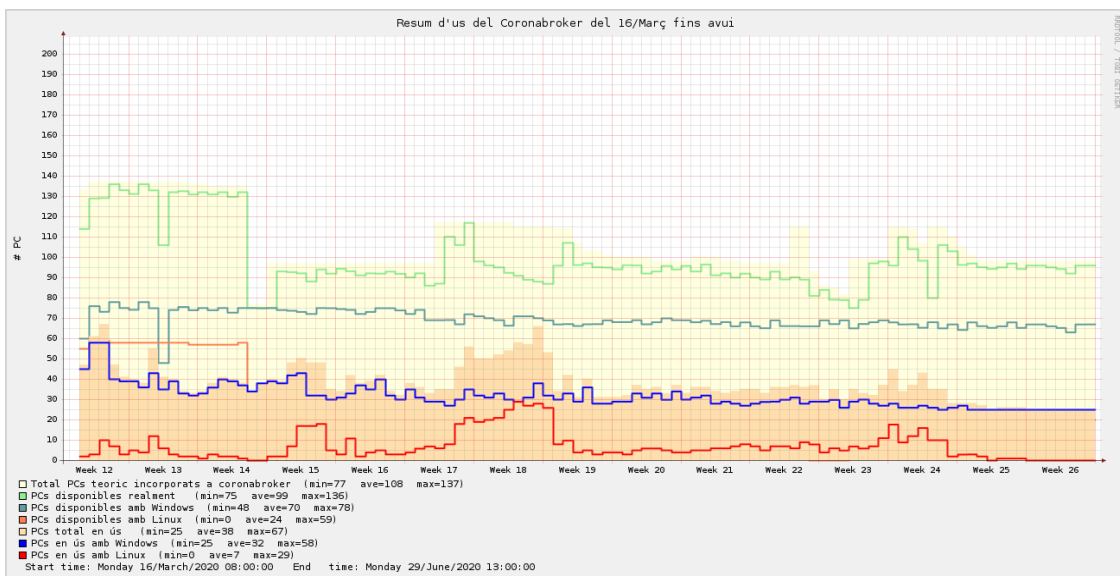
- Access to remote desktops (virtual classroom service based on RAVADA system). The service is working offering 20 remote Linux desktops. The graph showed below corresponds to the 18/03-29/06 period.
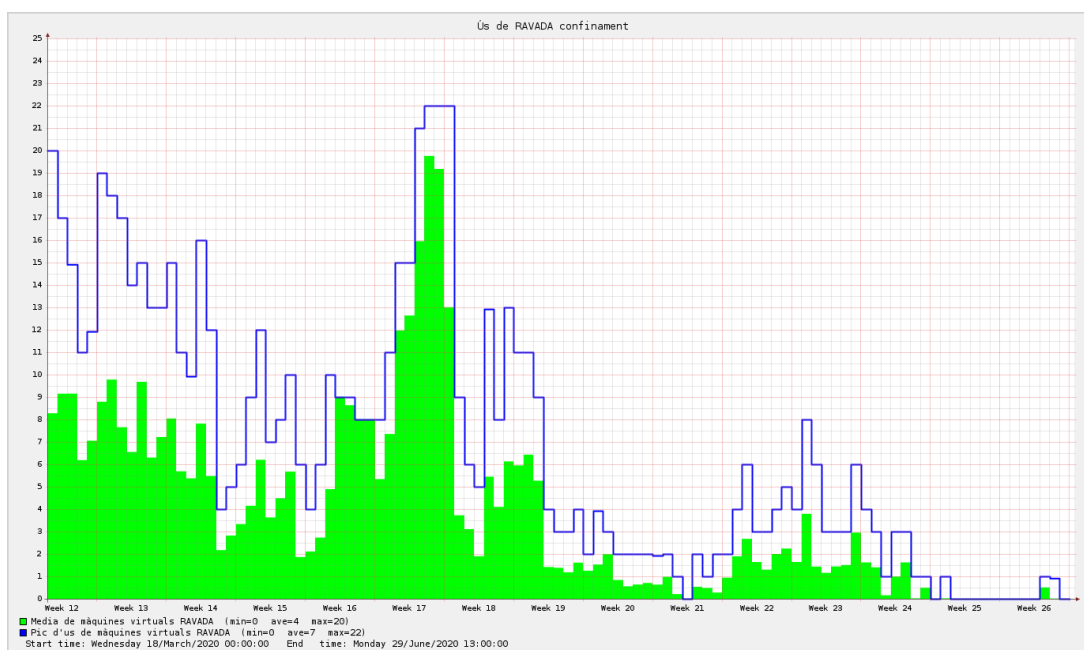
- Downloadable Linux image on students/teachers computers https://softdocencia.fib.upc.edu/software/:
  - Linux OpenSUSE 15.1 virtual image.
  - Linux Ubuntu 18.04 LTS 64 bits Operating Systems Classrooms virtual image.
  - Bachelor's degree subject-PES virtual image.
  - MasterDB for master BD virtual image.

Teleworking support

● Preparation of the PAS/dean's staff computers so that users can boot and connect to them remotely.
● Support for the settings of IP telephony soft clients.
● Troubleshooting to be able to access to UPC resources from personal computers/mobile phones.
● Support to use videoconference and chat tools.
● Preparation of teleworking plans for the entire ICT staff.

Requests for computer equipment

● Management of computer equipment requests for students/teachers with problems to carry on with the online teaching.
● Allocation of the available laptops before the lockdown.
● Home delivery of a laptop to a student during the lockdown.
● Management of the acquisition and home delivery of 15 digitiser tablets to teachers.

ICT support information
- Information for students:
  - Specific services information webpage https://www.fib.upc.edu/ca/com-treballar-remotament-estudiants
  - Infographic https://www.fib.upc.edu/sites/fib/files/documents/teledocencia-estudiant-fib.pdf
- Information for teachers: https://www.fib.upc.edu/ca/com-treballar-remotament-	pdi
- Information for PAS: https://serveis.utgcntic.upc.edu/ca/teletreball

Support during the state of alarm and the lockdown easing stage

- During stages 1 and 2 of the lockdown, some authorised technicians have occasionally gone to the campus to resolve ICT incidents considered critical that cannot be resolved remotely. Contingency plans have been reviewed in case it was not possible to go to the campus in person.
- From stage 3, assistance and resolution of incidents continue, preferably on a	remote mode.
  - Reception of incidents via telematics (ticketing tool https://peticions.utgcntic.upc.edu, email, technical phones, monitoring).
  - All development tasks, system and network management, monitoring of	remote evaluation systems, user support and coordination meetings will ideally be carried out remotely.
  - Urgent and planned actions as well as arranged enquiries that cannot be done remotely will be carried out in person.
  - Non-urgent actions that require personal attendance will be carried out the scheduled days for technicians' assistance.
  - For any enquiries or advice needed, an appointment must be made in	advance directly with the person through the usual channels (email, telephone and/or ticket).
  - Face-to-face shiftwork for all the personnel providing services to the FIB, putting	a special effort into preparing and supporting the computer classrooms.

Mobility apps
- Launch and adaptation of the new application for the mobility students enrolment.

Online assessment

- The *Racó* has been reviewed to improve the response time for online exams (tuning connection pools, code refactoring, etc.) and to have indicators.
- Transfer of incidents related to the integration with WIRIS (already resolved) and the start-up of the ATENEA EXAMS platform to the TIC/UPCnet Management. It is not a service directly provided by the ICT Unit.
- Commitment signature for academic integrity
  - The FIB has implemented the link at the *Racó* and the creation of a subject that includes all the FIB students.
- Creation of chat rooms with teachers who have requested it for a more direct support.
- Preparation in person of classroom settings for massive examinations. Generation of additional documentation for those cases.

● Preparation of the computer rooms for the resumption of re-evaluation face-to-face activities of the GCED and GEI.

● Participation in the CSUC Working Group on proctoring tools, to evaluate existing tools on the market and make a consortium proposal in October that the universities may agree to implement in the future. They are tools to support the identification of students and help preventing against fraud.

Bachelor and master's thesis online evaluation

● Definition and support to the evaluation process of bachelor's thesis (TFGs) and master's thesis (TFMs) online.

● An extension of the final project management tool has been developed and deployed in order to allow the online evaluation of the TFM, both for MAI/MEI/MIRI and for the master's degree in Secondary and Upper Secondary Education, Vocational Training and Foreign Language Teaching (MSEC). As for the MSEC, we have also received very positive feedback from the teaching staff.

● Integration of the TFGs/TFMs delivery process via the *Racó* using the anti-plagiarism system (URKUND).

● A tool has been developed for the automated creation of Google Meet rooms for project presentations. The solution has been shared with the rest of the ICT services of the UPC.

Indicators of use of the Racó for evaluation

Week	Logins	Different users		Number of sessions		Average duration in minutes		Number of	Number of	Number of
		Professors	Students	Professors	Students	Professors	Students	Documents	Deliveries	Practicals
9-15 March	33800	193	2219	1214	40395	8	8	276	733	95
16-22 March	26355	228	2159	2197	36005	12	11	477	1068	107
23-29 March	25534	220	2151	1997	36424	11	12	479	1531	125
30 March - 5 April	25624	216	2135	1833	36590	11	12	491	1765	110
6-12 April	19214	187	2083	1002	26222	8	9	256	990	37
13-19 April	26639	238	2183	1848	39911	10	12	476	2180	148
20-26 April	27223	223	2146	1787	40343	10	12	397	2177	115
27 April -3 May	27542	212	2098	1508	38531	10	13	474	1986	108
4-10 May	25271	182	2065	1354	35153	9	11	398	1381	129
11-17 May	24374	196	2068	1279	34628	9	12	375	1776	76
18-24 May	25817	200	2065	1432	37414	10	11	270	1253	114
25-31 May	28683	188	2078	1490	41653	10	12	325	2173	118
1-7 June	30019	194	2124	1302	41674	11	13	200	2459	43
8-14 June	33197	267	2158	1630	43823	9	12	216	863	37
15-21 June	34588	224	2144	1391	42478	9	11	162	833	31
22-28 June	31643	204	2037	1209	33026	8	9	153	335	13

We highlight the week of 1 to 7 June due to the high number of practicals delivered that were posted for quite a long time and the support for massive exams.

FIB students' deliveries from 1 to 21 June: 4,155 using the *Racó*.

FIB students' deliveries from March to the end of June: 23,503 using the *Racó*.

Indicators of use of ATENEA and ATENEA EXAMS (1-21 June 2020) for deliveries and evaluations

FIB students' deliveries from 1 to 21 June: 2,832 using ATENEA EXAMS; 4,305 using ATENEA.

	STUDENTS: assignments delivery per week				STUDENTS: questionnaires delivery				ESTUDIANTS: overall delivery per week		
	1/6/20	8/6	15/6		1/6/20	8/6	15/6		1/6/20	8/6	15/6
ATENEA EXAMS	40	87	175		590	604	1336		630	691	1511
%UPC	0,87%	1,10%	1,58%		9,96%	3,36%	10,45%		5,99%	2,67%	6,34%
UPC TOTAL	4596	7925	11043		5926	17994	12780		10522	25919	23823

	STUDENTS: assignments delivery per week				STUDENTS: questionnaires delivery				ESTUDIANTS: overall delivery per week		
ATENEA											
	1/6/20	8/6	15/6		1/6/20	8/6	15/6		1/6/20	8/6	15/6
FIB	163	680	256		1239	912	1055		1402	1592	1311
%UPC	0,45%	2,40%	1,01%		7,22%	5,70%	10,51%		2,62%	3,59%	3,71%
UPC TOTAL	36366	28300	25315		17155	16003	10038		53521	44303	35353

Investments and ICT Infrastructure

● Reception and physical installation of servers and additional disks for the new NAS system of the UPC.
● FIB backup service migration based on legato and with its own robot to the new Backup service to disk of the UPC.
● Call for renewal of Teaching Equipment 2020. Two requests (co-funding of 28,800 €) and several acquisitions (2 servers for virtual desktops, 1 server for teaching cloud) managed. Equipment pending to arrive.
● ICT Plan 2020. Renewal of 120 out-of-warranty classroom PCs and 11 monitors PAS/ Management requested. 14 PC classrooms and 10 monitors for PAS/management provided. Co-funding of 8,950 €.
● Hybrid classrooms. 45,908,00 € allocated to FIB as a part of the extraordinary   budget heading for the "Resources of multimedia classrooms at UPC centres for the academic course 2020-21". 18 classrooms will be equipped in buildings A5 and A6 (4 amphitheatre classrooms, 4 intermediate level rooms, 9 classrooms in floors 1 and 2) as well as one in the C6 module.

Coordination with ICT management, UPCnet and COTETIC

Work has been done with the IT Management and COTETIC advising on support services implementation for remote teaching (Meet, Chat. Drive, ATENEA, ATENEA EXAMS tools, etc.).

GSuite for Education
- Registration of all the teaching staff to GSuite.
- Registration of all the students to GSuite (domain @estudiantat.upc.edu, without mailbox).
  - At present without a mailbox, but work is being done on this issue in order to also offer a mailbox to the students with the address @estudiantat.upc.edu.
  - They do not appear in the Google directory to meet the requirements set by data protection regulations.
    - Information has been added to the *Racó* in order to know how to search for them on Google.
- Creation in Google of groups of students of the subjects to facilitate inviting them to classes via meet or chat rooms. https://serveistic.upc.edu/ca/g-suite-for-education/documentacio/groups
- Changes to Google Meet settings to carry out classes/video conferences and recordings. The Premium version of GSuite for Education (to open in a new window; up to 250 participants to the Meet, streaming for up to 100K users, recordings from the Meet to the Drive) will be available until September 30.
- Detection of different errors and aspects derived from the massive registration that have been eventually solved.

Support for UPC.EDU mail migration to Google
- Migration of FIB and UTG CNTIC users on 1/04.
  - Support for migration.
  - Video conference sessions, chat rooms for working groups, creation of additional support online material.
- Migration user departments from the FIB area:
  - AC (2/04), CS (3/04), ESSI (2/04), MAT (31/03), EIO (24/04), ESAII (24/04), FIS, OE (23/04).

UPCLink
- Increasing VPN licenses and adaptation to new address ranges.

"UPC Estudiants" app
- Available on the Apple Store and Google Play.
- Work is being done to upload the FIB timetables so they are available from the App.

Students email
- Project to activate students email in Google. During next enrolment period, we will integrate the students' email into the G Suite account, so that all UPC students will have the email address nom.cognoms@estudiantat.upc.edu and a 1 TB of storage Google Suite mailbox. The process will be carried out as follows:
  - Current students: on 13 July, the G Suite email service nom.cognom@estudiantat.upc.edu will be activated. This activation implies a change in the email addresses of the entire UPC students, since until now their email address was either nom.cognom@estudiant.upc.edu or nom.cognoms@est.fib.upc.edu in the case of FIB students.
  - New students: at the time of enrolment they will have all the G Suite services integrated at the nom.cognom@estudiantat.upc.edu address.
- Redirection of emails will remain from existing addresses @est.fib.upc.edu for current students.

Coordination of the academic year 2020-2021 preparation
- ○ Subjects groups' project
    - ■ GSuite groups will be created for the subjects and their groups.
- ○ Participation in the classroom-at-home workgroup to plan virtual desktop infrastructures and the BYOD model.

Other

Reopening of the North Campus Library (BRGF) regarding the book lending service.
FestaFIB online on Saturday, 16 May 2020 via Twitch and Discord.

ACTIONS AND MEASURES TAKEN IN THE AUTUMN SEMESTER OF THE ACADEMIC YEAR 2020/21 (September 2020 – January 2021)

On June 2020, we began actions to adapt the facilities to the needs of the health situation.

Regarding the infrastructures, the main actions taken were:
- Improvement of the air renewal in the teaching areas either by adding new windows in the classrooms (when possible) or by installing a forced air ventilation system.
- Reducing the capacity of the classrooms to 50%.
- Limiting the use of computers and laboratory equipment to 1 person during academic activity.
- Installing hydroalcoholic gel dispensers, disinfectant liquid as well as paper towel for cleaning hands, furniture and teaching equipment in general.
- Labelling of the facilities with instructions on the measures to contain the spread of the pandemic.
- Defining a route regarding the movement of people to avoid crowds and minimising contact with others by enabling social distancing.
- Delivery of reusable hygienic masks throughout the UPC community.

On the other hand, many classrooms were equipped (the ones with higher capacity) with video cameras to enable live streaming of the activity that is taking place in the classroom. Those computers allow a hybrid classroom setting (students attending the classroom in person while others follow the class online) as well as the option of teaching online using the resources available in the classroom (computer room, laboratory, blackboard and other elements in a standard classroom).

The hybrid classroom format has been very useful for students who have been temporarily under home isolation by facilitating the follow-up of teaching.

Organisational actions as a teaching support to face the impact of COVID-19

Timetables organisational changes

The timetables were scheduled:
- ➢ to minimise mobility to the North Campus.
- ➢ to encourage stable groups.
- ➢ to reduce changes in classrooms and, in general, to minimise contact with others throughout the day.

Actions to support teaching

Provision of 13 modules of 20h UNITEACH scholarships for teaching support.

Provision of 20 h per week of additional recruitment of teachers to deal with situations caused by the organisational changes in teaching.
- Updating of the course guides.
- Online enrolment (July and September).

Impact of COVID-19 on the academic activity

Since last month of June, all the FIB's effort has been focused on adapting the activity to the context of the pandemic:

- Time scheduling to reduce mobility and the number of contacts (bubble   groups).
- Adaptation of the spaces to the health criteria.
- ICT infrastructure to support online teaching and hybrid teaching.
- Implementation of attendance and traceability systems ("*socaqui*") in the classrooms.
- Implementation for the student support of a system by appointment (secretariat, agreements, mobility, etc.).
- Monitoring of the situation of people affected by COVID-19 (close contacts, confirmed cases, etc.) by the "info.covid" team.
- Issuing certificates to prove night mobility (people with face-to-face activity).

The academic year started as follows:

- GEI and GCED: 1st and 2nd year, 100% face-to-face (4 face-to-face days per week); 3rd and 4th, 50% face-to-face (2 face-to-face days per week).
- MEI: 100% face-to-face.
- MIRI: 96% face-to-face (AMMM and SMDE laboratory switched to online).
- MAI: 55% face-to-face (URV 100% online, UB 66% online, and UPC-CI and IHLT laboratory online).
- MSEC: 1 weekly seminar.
Percentage of 69.8% of face-to-face activity.

Due to new restrictions approved by governmental authorities on October 15th, the FIB planning was adapted.

According to Resolution SLT/2546/2020 of 15 October:

- GEI and GCED: 1st and 2nd year, 50% face-to-face (2 face-to-face days per week); 3rd and 4th, 100% online.
- MAI, MEI and MIRI: 100% online, except for a few face-to-face labs.
- MSEC: Some occasional seminars (maximum 1 face-to-face day per week).
Percentage of 18% of face-to-face activity.

Evaluation

Due to the change in the scheduled timetable to minimise student's mobility and define stable groups, the Monday and Thursday midday slots have been temporarily suspended for evaluation tests as well as the Wednesday midday slot for carrying out cultural and sports activities. All the mid-semester evaluation activities carried out outside of the classroom have been reallocated on the 5, 6, 9, 10 and 11 November 2020. Almost all of the exams were performed face-to-face.

The exam calendar for January 2021 was kept as planned before the start of the academic year (in July 2020), and 95% of the exams were carried out face-to-face.

Performance

Despite the exceptional situation caused by the pandemic and the dramatic reduction in attendance as of 15 October, the performance of the degrees has been similar to that of previous years.

The following table is the summary of the performance of the GEI students according to the specific semester of the degree or curricular area, and it is compared with the performance of the previous academic year (the previous semester to the outbreak of the pandemic, which developed normally).

	Q. Tardor 20-21		Q. Tardor 19-20	
	% Aprovats	% NP	% Aprovats	% NP
Q1	79,14%	3,46%	69,36%	7,89%
Q2	56,23%	17,89%	59,05%	10,98%
Q3	80,03%	2,63%	86,29%	1,65%
Q4	64,04%	10,02%	68,43%	4,41%
Q5 PAR/PROP	91,72%	1,41%	89,61%	2,08%
COM	77,97%	6,96%	78,19%	6,91%
EC	90,29%	6,86%	80,70%	6,58%
ES	96,05%	0,66%	95,22%	2,59%
SI	95,25%	1,40%	90,97%	4,17%
TI	94,81%	1,91%	90,57%	3,37%
OPT	97,57%	0,61%	93,82%	2,43%

In E.2.1.11, COVID/Subject Marks folder there is the summary of the marks of the subjects regarding all the degrees in the fall semester of the academic year 20-21.

Supporting tools for the management of people with symptoms, COVID-19 patients or people in self-isolation

● Creation of a contact email for the communication of situations related to COVID-19, info.covid@fib.upc.edu, running since 14 September. The option for info.covid@fib.upc.edu to send emails to all Groups (teachers + students) of GSuite was enabled.
● Collecting student data through a form in the event of any incident. Available from 9 November.
● Mechanism to collect attendance + location data through a spreadsheet (from 14 September to 19 October).

● Application for self-registration of attendance ("*socaqui*") that allows to collect all the information in a centralised way (from 19 October).
● *Racó* with available features for all the teachers in order to see which students are in isolation.

● *Racó* with features that facilitate traceability.

Evolution of positive cases of COVID-19 reported among students

2020								2021			Total
1-Sept 4-Oct	5-Oct 13-Oct	14-Oct 28-Oct	29 Oct 09-Nov	10-Nov 20-Nov	21-Nov 30-Nov	1-Dec 10-Dec	11-Dec 16-Dec	7-Jan 31-Jan	1-Feb 9-Feb	10-Feb 23-Feb	Total
3	4	14	11	1	2	0	1	9	0	3	48
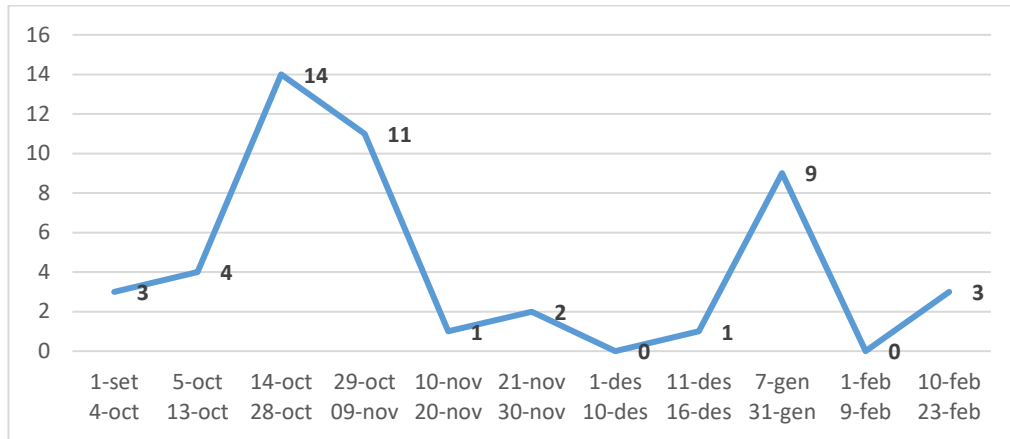
Organisational and infrastructure actions to tackle the impact of COVID-19
- PAS Organisational:
  - Mixed working shifts: teleworking and face-to-face work, when allowed by the type of job.
  - Workplaces according to rules of social distance and use of masks. Protective screens to the points of attention.
  - User support by appointment.
  - Common areas and workplaces equipped with "clean points". Hydroalcoholic gel and paper dispenser, as well as a bin.

ICT actions to tackle the impact of COVID-19

Hybrid Teaching Support
- 19 classrooms equipped as a hybrid facility in modules A5 and A6 (45,908 € provided by the Governing Council to FIB).
  - 4 amphitheatres with Minrray cameras and ambient microphones (A5001, A5002, A6001, A6002).
  - 15 classrooms with Polycom studio video conferencing systems (A5E01, A5E02, A5102, A5104, A5202, A5204, A6E01, A6E02, A6101, A6102, A6103, A6104, A6202, A6203, A6204).
  - Demonstration and training sessions.
  - Recruitment of 4 support grantholders.
    - Coordination with the other schools and the North Campus Management Unit to agree on the classroom format and solve problems.
- Additional equipment (November 2020), 6 polycom classrooms:
  - A6105, Computer Labs: A5S102, B5S101, B5S202, C6S303, C6S308.

● Acquisition of 27 webcams (with tripod and wire extender) to be used in the computer classrooms and the rest of the classrooms on a one-time lending basis.
● Acquisition of 30 Wacom tablets for lending to PDI.
● Acquisition of 10 voice amplifiers.
● Recruitment of support grantholders.
● Support model in these classrooms under review.

Other related issues:

● Detection of teachers' needs (through a form, email, etc.) and lending/purchasing management: 23 requests managed via form, 6 additional requests. Tablets lending and additional purchases (webcams, headphones, etc.) are processed. Expenses chargeable to the teaching budget allocation.
● Acquisition of laptops and other equipment for teachers (carried out by departments F, MAT, AC, OE, ESAII, CS).
● Renovation of switch boxes and speakers for A5 and A6 amphitheatres (in charge   of   North Campus Management Unit).
● Modifications to classroom A6203 in order to discard elements that are no longer used and installation of the same type of control boxes as in the rest of the classrooms.
● Audiovisual equipment renovation: A5S102, A5S109, C6S309.
● Acquisition of an additional monitor for all hybrid classrooms (installation pending).

Adaptation of computer laboratories
● A5: New forced air ventilation system for the computer classrooms of the A5 (https://www.fib.upc.edu/ca/noticies/nou-sistema-de-ventilacio-forcada-de-les-aules-informatiques- de-la5).
   ○   A new forced air ventilation system has become operational to improve the air quality of the FIB computer rooms located in basement 1 of the A5 building.
   ○ This system consists of 4 forced air ventilation units with enthalpy recovery of 4,000m^3/h each and a duct network that runs through the suspended ceiling.
   ○   Each classroom is equipped with air supply grilles previously treated with filters (F7 and F9) to ensure the quality of the air supplied inside the classrooms and intake grilles for stale air to be expelled outside   the building.
   ○   The recovery unit control system has CO_2 air quality probes and dirty filter detection and allows remote equipment monitoring.
   ○   The cost of this facility has been 76,552.67 € and is framed within the specific actions carried out to face the COVID-19 situation.
● B5: new windows to improve cross ventilation.
   ○   New 5 x 1 m window in classroom B5S101.
   ○   Opening windows B5S201, B5S202.
   ○   Adaptation of the ventilation gallery windows that overlook the FIB square.
   ○   Checking the outside air intake through channelling.

- C6:
    - Inspection and repair of the air conditioning pipes.
    - Installation of purification equipment in indoor classrooms.
    - Replacement of the front door (pending).
- Reduction of some classrooms capacity to ensure 2.5 m² per person and 1 person per computer.
- Signposting and PPE (Personal Protective Equipment).
- "Soft" actions of opening doors/windows to force ventilation. Condition monitored.
- Specific measurements of CO_2 levels.

Adaptation of free classrooms for access to online classes
- Incorporation of workplaces to the reservation system.
- Adjustment of the attendance registration system ("*socaqui*") to this purpose.
- Labelling of computer classrooms tables with QR codes.

Adaptation of the *Racó*
- Adjustment of the register of attendance system to be able to call the roll at a class or classroom. Traceability of contacts from this record.
- Monitoring COVID-19 affected on classrooms and subject groups.
- Tendering process to acquire a storage cabin and two virtualisation servers for teaching environment/*Racó* (partially financed with 32,057.44 € of COVID-19 funds).

Virtual classroom system upgrade and extension - Linux virtual desktops
- More information https://www.fib.upc.edu/ca/la-fib/serveis-tic/aulavirtual.
- Increase of the number of servers to 3, incorporating more power (co-financed with the teaching equipment fund). The current capacity is approximately 80 + 80 + 40 Linux desktops.
- Upgraded version that enables cluster operation.
- It is planned to upgrade the disk capacity and include Windows desktops, but only Linux desktops are available for now.

CORONABROKER Activation - Linux and Windows
- Activation of the remote connection to the PCs in the computer rooms that are closed for teaching to facilitate access from theory classrooms or from home.

Laptops and mobile classroom
- Acquisition of 17 laptops for students lending.
- Acquisition of 30 laptops and trolley to store/carry them to be used in theory classrooms (pending to arrive).

Linux image downloadable to students/teachers computers
(https://softdocencia.fib.upc.edu/software/)
- Updated Linux OpenSUSE virtual image to 15.2 with the latest changes made in the classrooms.

Adaptation of other laboratories
Acquisition of additional equipment to avoid sharing of material so the students are able to work from home (virtual reality headsets, electronic components, processing boards).

GSuite groups and changes (coordination with the UPC ICT Area)
● Activation of student mailboxes with the email address nom.cognoms@estudiantat.upc.edu and a mailbox in Google Suite of 1 TB of storage.
● Creation of Gsuite groups by subject group and daily synchronisation with PRISMA data.
● Agreement signed to use GSuite Enterprise for Education.

Renewal of equipment and expansion of ICT services

Classroom equipment renewal and ICT Plan 2020
● Renewal of 95 classroom PCs (orders already sent, 14 co-funded by the ICT Plan, pending to arrive).
● Renewal of 117 classroom monitors (50 of them were installed before the summer, 67 remaining orders sent, pending to arrive).
● Renewal of FIB management and PAS equipment (100% funded by the ICT Plan, pending to arrive).

Virtual machines system expansion (virtech)
● Expansion of the service by adding a server that provides more computing power and memory to the opennebula, so that more virtual machines are hosted. (Server co-financed with the teaching equipment fund).
● This system is currently used at PES and PTI degree subjects as well as at the BDMA master's degree.

Storage services extension
● Implementation of a new NAS server for classrooms.
● Implementation of the nextcloud for classrooms (remote access to data).
● Acquisition of 2 network switches for a new storage environment (pending to arrive).

Additional actions on applications and information systems

TFG / TFM
● Work is currently underway to digitise the TFG-GCED and TFM-MSEC   process.

Online assessment
● Participation in the CSUC Working Group on proctoring tools to evaluate existing tools on the market and make a consortium proposal in October that the universities may agree to implement in the future. They are tools to support the identification of students and help preventing against fraud.
● Support to the TFG/TFM online evaluation.

Work placements management
● Participation as a pilot site in the two new UPC applications:
    ○ Job bank for internships.
    ○ Management of the internships agreements using PRISMA.

"UPC Estudiants" app

● Available on the Apple Store and Google Play.
● Work is underway to upload the FIB timetables so they are available from the App.