

Programme Outcomes for Accreditation¹

Programme Outcomes can be described as quality standards for knowledge, skills and competences that graduates of an accredited course should have achieved as the educational base for practising their profession or for post-graduate studies. They will vary in extent and intensity in accordance with the differing objectives of First and Second Cycle degree (FCD and SCD) programmes. In the Euro-BusInf Framework they are arranged into the following six categories:

1. Business Informatics Fundamentals
2. Analysis
3. Design and Implementation
4. Economic, Legal, Social, Ethical and Cultural context
5. Business Informatics Practice
6. Other Professional Skills and Competences

Information systems are used in many types of organisation but all graduates from an information systems programme should be aware of the underlying concepts relevant to their programmes of study. The first category “Business Informatics Fundamentals” therefore identifies capabilities that are essential to satisfying the other programme outcomes, independently from the specific specialisation and application context.

“Analysis” involves the application of informatics concepts and tools to the analysis of both problems and their solutions, while “Design and Implementation” involve the creation and development of an economically viable information system to meet a defined need. It involves significant technical and intellectual challenges and can be used to integrate knowledge of organisational processes with informatics knowledge and skills to produce solutions for real and complex problems.

The use of information systems can have impacts on individuals, on commerce, on society and on the environment. The “Economic, legal, social, ethical and cultural context” category identifies the skills that graduates need to manage their activities and to be aware of the various legal and ethical constraints under which they are expected to operate, including an understanding of the need for a high level of professional and ethical conduct in relation to activities in informatics and a knowledge of professional codes of conduct.

“Business Informatics Practice” identifies the practical capabilities that graduates should have demonstrated through the application of their skills in a variety of situations. They should have demonstrated that they have an understanding of the contexts in which information systems may be used.

Social or soft competences, listed under the category “Other Professional Competences” are crucial to communicate information, ideas, problems and solutions. Besides the so-called soft skills, the category also includes personal organisational skills, team working and life-long learning.

The same arrangement of categories is maintained for the programme outcomes of Second Cycle Degree (SCD) programmes. They apply in addition to the competences described for graduates of FCD programmes. Although all six outcome categories are used to describe expected outcomes of both FC and SC programmes, there are important differences in the requirements at the two levels. These differences in the levels of First and Second Cycle accredited informatics programmes should inform the interpretation of the programme outcomes by HEIs and by auditing teams. For instance, whereas First Cycle graduates should be able to formalise and specify real-world problems whose solution involves the use of informatics, Second Cycle graduates are, in addition, expected to have demonstrated their ability to specify and complete informatics tasks that are complex, incompletely defined or unfamiliar.

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No restriction is implied or intended by this document in the design of programmes to meet the specified programme outcomes. For example, the requirements of more than one outcome could be satisfied within a single module or unit such as individual or group project work. Similarly, it is possible that some programmes are designed such that the requirements of the Other Professional Competences category are taught and assessed entirely within modules or units designed to satisfy the requirements of other outcomes, whereas in other programmes the Other Professional Competences requirements are taught and assessed in modules or units designed specifically for this purpose.

Outcomes for First Cycle Degree (FCD) Programmes

1. Business Informatics Fundamentals

Graduates of a First Cycle degree should be able to:

1. describe the fundamental concepts related to organisational strategies, structures and behaviours
2. describe and explain the opportunities, challenges and risks of digital transformation and industry evolution
3. outline relevant historical and current developments in information systems and show insight into possible future trends and developments
4. explain the principles of process analysis and relate them to specific contexts
5. describe and explain the essential facts and concepts relevant to hardware and software, IT equipment and digital communications
6. outline the characteristics of state-of-the-art hardware, software and communications technology
7. explain how organisational models, data, applications and IT infrastructure are related as elements of an enterprise architecture

2. Analysis

Graduates of a First Cycle degree should be able to:

1. use a range of information systems techniques to identify the requirements of real-world problems, analyse their complexity and assess the feasibility of potential solutions
2. extract data from multiple data sources and conduct descriptive and predictive analysis using, where appropriate, statistics and probability techniques
3. apply modern business process modelling, documentation and analysis tools and techniques to the knowledge drawn from their domain observation, stakeholder interviews, prior document analysis, etc.
4. describe a problem and its solution at varying levels of abstraction
5. use relevant analytic, modelling and simulation methods to assess the performance and risks of business processes
6. analyse the extent to which an information system meets the criteria defined for its current use and future development

3. Design and Implementation

Graduates of a First Cycle degree should be able to:

1. design and develop applications, application architectures and integrated systems that satisfy organisational requirements, user needs, usability and accessibility requirements, and provide a high-quality user experience
2. select an appropriate life cycle model for specifying, building, testing and commissioning new information systems and for maintaining existing systems
3. select and use appropriate programming environments and data management techniques for projects involving traditional applications as well as emerging application areas
4. describe and explain solution patterns, algorithms and data structures appropriate to the creation of a particular information system
5. apply relevant practical and programming skills to the creation of basic software systems

4. Economic, Legal, Social, Ethical and Cultural Context

Graduates of a First Cycle degree should be able to:

1. demonstrate awareness of the need for a high level of professional and ethical conduct in information systems practice and a knowledge of professional codes of conduct
2. explain how commercial, economic, cultural and social considerations affect information systems deployment

3. identify relevant legal requirements governing information systems, including data protection, intellectual property rights, contracts, product safety and liability issues, sustainability issues, personnel issues and health & safety
4. explain the importance of information privacy and security issues in relation to the design, development, maintenance, monitoring and use of information systems

5. Business Informatics Practice

Graduates of a First Cycle degree should be able to:

1. compare and select industry reference models and best practices for IT governance
2. describe and explain IT governance processes, for example, financial planning and control, demand management and maintenance of information systems
3. describe and compare management techniques relevant to the design, implementation, procurement, sourcing, testing and deployment of information systems including configuration management and change management
4. apply project management techniques to IT projects
5. identify risk issues, including security, health & safety, environmental and commercial risk, and explain risk assessment, risk reduction and risk management and disaster recovery techniques
6. undertake literature searches and reviews using databases and other sources of information
7. design and conduct appropriate practical investigations of application performance and scalability

6. Other Professional Skills and Competences

Graduates of a First Cycle degree should be able to:

1. organise their own work independently, demonstrate initiative and exercise personal responsibility
2. communicate effectively both verbally and using a variety of communications media to a variety of different audiences
3. plan self-learning and improve personal performance as a foundation for lifelong learning and ongoing professional development
4. identify different ways of organising teams and the various roles within a team
5. participate effectively in collaborative discussions and in information systems group-working

Outcomes for Second Cycle Degree (SCD) Programmes

1. Business Informatics Fundamentals

Graduates of a Second Cycle degree should be able to:

1. demonstrate either deepened knowledge of a chosen specialisation or broadened knowledge of information systems in general
2. explain in depth relevant concepts and principles appropriate to their programme of study, some of which may be from outside information systems
3. demonstrate awareness of topics at the forefront of their specialisation and evaluate their significance

2. Analysis

Graduates of a Second Cycle degree should be able to:

1. apply appropriate analysis methods to the solution of complex problems in information systems and to assess their limitations
2. use fundamental knowledge to investigate new and emerging technologies and methodologies
3. 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.

3. Design and Implementation

Graduates of a Second Cycle degree should be able to:

1. describe and explain design processes and methodologies relevant to their subject area and be able to apply and adapt them in unfamiliar situations
2. specify and complete information systems tasks that are complex, incompletely defined or unfamiliar
3. apply state-of-the-art or innovative methods in problem solving, possibly involving the use of other disciplines
4. demonstrate that they can think creatively to develop new and original designs, approaches, methods, *etc*

4. Economic, Legal, Social, Ethical and Cultural Context

Graduates of a Second Cycle degree should be able to:

1. demonstrate awareness of the need for a high level of professional and ethical conduct in information systems
2. identify relevant legal, commercial, economic, cultural and/or social contexts appropriate to their area of study and explain their relevance
3. evaluate risk and information security issues relevant to their area of study

5. Business Informatics Practice

Graduates of a Second Cycle degree should be able to:

1. describe and explain applicable techniques and methods for their particular area of study and identify their limitations
2. apply information systems techniques to new application areas, taking account of relevant commercial, cultural, social and environmental constraints
3. contribute to the further development of information systems

6. Other Professional Skills and Competences

Graduates of a Second Cycle degree should be able to:

1. organise their own work independently, demonstrate initiative and exercise personal responsibility
2. 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

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