

SECTION B: PROGRAMME-SPECIFIC SECTION

BUSINESS INFORMATION TECHNOLOGY

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1. General provisions

Article 1.1 About this Section

The Teaching and Examination Regulations (TER) are subdivided into two sections (Section A and Section B), which together form the TER. Section A, which can be seen as the faculty section, includes provisions that apply to all EEMCS Master's degree programmes. Section B contains the provisions that are specific to the particular degree programme, in this case the Master's programme Business Information Technology.

2. Programme objectives and final attainment targets

Article 2.1 Aim of the programme

1. The primary goal of the Master's programme on Business Information Technology (MBI) is to provide graduates with a combination of academic and professional skills and specialized technical knowledge that will enable them to analyse, design, validate and implement advanced ICT systems in their usage context. The students are trained to participate in and contribute to research in the field and international developments in and related to the field in scientifically, ethically and socially sound ways.

The Master's programme offers a stimulating and challenging research-oriented environment in which the following secondary goals are achieved:

- a. Students acquire comprehensive knowledge and insight and develop their professional and academic skills based on initiative and personal responsibility for the learning process.
- b. Students develop an investigative and reflective attitude.
- c. Students acquire an understanding of and gain experience in methods and techniques to be able to model and describe systems and their properties.
- d. Students acquire knowledge of, insight into and experience with requirements identification, design, validation and implementation of ICT systems. They learn to use this knowledge, insight and experience in their search for meaningful and promising alternatives and for making well-considered choices.
- e. Students acquire knowledge of, insight into and experience with requirements identification, design, validation and implementation of business networks. They learn to use this knowledge, insight and experience in their search for meaningful and promising alternatives and for making well-considered choices.
- f. Students develop an attitude that promotes constructive criticism whereby choices are substantiated and discussed.
- g. Students work in a team and contribute to the application and/or development of theory, methods, technologies and tools for the development of ICT systems taking into account their usage context.
- h. Students gain experience to function in complex dynamic situations in which the relevant information is not always immediately and fully available.

To further activate their education (with cases, research assignments and discussion of the research, developments and literature in the field), students are encouraged to follow developments in the field and can directly and independently coordinate their personal progress towards these developments.

The goal of the Master's programme is to enable the graduates with the aptitude and proven talent for academic research to continue their education with doctoral research.

The Master's programme on Business Information Technology has a particular emphasis on innovative developments and the integration and optimisation of business processes and ICT. The programme focuses on acquiring comprehensive knowledge and insight, as well as gaining experience in the integrated development of organizations and their business processes and ICT systems, and related theories and concepts. Methods and technologies, as well as the analysis, evaluation and modelling of both functional and qualitative properties, are important aspects of the programme. Based on solid knowledge and an understanding of the life cycle of ICT systems in their business context, the Master students develop the skills and insight required to manage innovative development processes in an architectural framework and in an environment of internationally-oriented business networks. Insight into the current research in this area is promoted in a number of different ways. Students of the Master's programme develop a constructive critical and reflective attitude by analysing research and design activities, both their own and of others.

Article 2.2 Programme Intended Learning Outcomes

The Master of Science programme on Business Information Technology prepares students to occupy a leading position in the field of Information Systems (IS). Knowledge in the field of management and IT is the very core of their preparation. The Master graduates are capable of integrating and applying this knowledge in the broad context of organizational practice, and have also at their disposal well-developed skills in communication, interpersonal relations and group work. Finally, the Master graduates possess the special skills needed for a successful career future, for example, knowledge of IT and organizations, a critical attitude and a disposition towards lifelong learning and innovation.

The Programme Intended Learning Outcomes:

1 Business-IT alignment knowledge and skills

- 1.1 The graduate understands, and can act upon, the concept of business innovation, including the interaction between IT innovations and innovations in business processes and business organization.
- 1.2 The graduate understands and is able to assess the short and long-term impact of the business strategies on both the effectiveness and the efficiency of IT
- 1.3 The graduate is capable of developing business strategies and business information system strategies, and operationalizing them in an architectural framework.
- 1.4 The graduate can apply the conceptual framework of Enterprise Architecture to improve business-IT alignment.
- 1.5 The graduate knows how to apply methods and techniques for the integrated development of business processes and business information systems, by making a reasoned selection, by communicating the principles and by contributing to their further development.
- 1.6 The graduate knows how to apply information systems methods and techniques like requirements analysis, resource management & planning, architectural design, implementation and administration for alignment and life cycle management of information systems.
- 1.7 The graduate has competences from at least one of the specializations of the BIT master programme:
 - 1.7.1 ITMI: The graduate is capable of applying IT in projects in organizations to improve business performance.
 - 1.7.2 DSB: Graduate is capable of analyzing and interpreting large amounts of data to make business decisions, such as reconfiguration of organizations and their IT infrastructure.
 - 1.7.3 EA: The graduate is capable of designing IT systems to effectively support business processes, strategy and mission.

2 Scientific approach

- 2.1 The graduate can independently systematically apply the design cycle (analysis, design, implementation, evaluation and reflection) to complex IT and business problems, by selecting and applying theories from different disciplines if necessary.
- 2.2 The graduate can independently systematically design and execute a research plan (literature research, problem analysis, formulating hypothesis, design and execution research plan, data analysis, report, conclude) crossing different disciplines or fields if necessary and to contribute to the scientific research.
- 2.3 The graduate has MSc level knowledge of and is able to apply research methodology and research ethics, in the areas of both social science research and design research.
- 2.4 The graduate can apply creative and critical thinking, reflection and argumentation.
- 2.5 The graduate is capable of independently acquiring new knowledge and skills from different disciplines.

3 Professional skills

- 3.1 The graduate can cooperate, discuss and report in written and verbal ways, in English, in both a professional and a research setting, and is aware of the differences between these settings.
- 3.2 The graduate is capable of working as part of a (multi-disciplinary) team in different roles, as member or leader, in terms of sharing responsibilities, applying time management, and planning resources and reporting, and is aware of group dynamics in development projects.
- 3.3 The graduate is capable of functioning as a professional in and between different disciplines/fields.
- 3.4 The graduate is capable of setting up and leading a (simple) enterprise.

4 Taking account of Social and Temporal context

- 4.1 The graduate is capable of analyzing and discussing ethical, social, cultural and societal aspects of problems, solutions and developments and their consequences in the field.
- 4.2 The graduate can value differences between cultures and can learn from these.

Article 2.3 Didactic concept

The didactic concept of the MBI programme is based on the three "O's" that characterize the University of Twente's academic programmes: Research ('Onderzoeken'), Design ('Ontwerpen') and Organization ('Organiseren'). The University of Twente also encourages a multidisciplinary approach and provides ample room for internationalization. An entrepreneurial attitude and an emphasis on designing solutions for complex problems complete our university's profile. As a consequence, the didactic concept that lies at the heart of this Master's programme can be characterized as being a mixture of (1) knowledge development in the classical sense, (2) integration of this knowledge in project-based courses and (3) the weaving of several lines of learning between individual courses.

Concerning more specifically the research aspect, this programme prepares the students to operate at the level of junior researcher by familiarizing them with the Design Science paradigm, as introduced by Hevner, March, Park & Ram¹. This is a scientific paradigm that aims at increasing human and organizational capabilities through the creation of new and innovative artefacts. Within this paradigm,

¹ Hevner, A., March, S., Park, J., & Ram, S. (2004). Design science in information systems research, *MIS Quarterly*, 28(1), 75-105.

the building and application of the newly designed artefacts creates knowledge and understanding of the problem domain as well as of the ways of solving problems.

3. Further admission requirements

Article 3.1 Additional admission requirements

A request to be admitted to the programme is assessed by the MBI Admission Committee. In addition to the general criteria, the MBI Admission Committee distinguishes two types of (inter)national education:

1. Research Universities (offer more research-oriented programmes);
2. Universities of Applied Sciences (prepare students for more practical jobs).

The assessment of all applicants' skills is based on their academic background. The MBI Admission Committee has specific requirements depending on the degree of the applicants. Knowledge gaps can be repaired during a pre-master's programme, which should be successfully completed before the student is admitted to the master's programme. In case the knowledge gap is limited, repair can happen during homologation courses incorporated in the Master's programme.

The MBI Admission Committee determines the duration and content of the pre-master's programme and/or homologation courses. As a general guideline, the study load of the homologation courses should not exceed 15 EC.

The regulations for the different educational backgrounds are:

1. *Dutch Research University Degree*

1. A Bachelor's degree awarded by a Dutch university.
Applicants with a Bachelor's degree other than Business & IT or Information Science in a related field awarded by a Dutch university are eligible for admission depending on the contents of their Bachelor's programme. Concerning English proficiency and possible homologation courses, the Admission Committee decides for each applicant whether additional requirements should be set or a proficiency test should be taken.
2. A Bachelor's degree awarded by the University of Twente:
 - a. Applicants with a Bachelor's degree in Business Information Technology are directly admitted to the programme.
 - b. Students who have completed a Computer Science and Engineering(TCS) or Industrial Engineering & Management science (TBK) are directly admitted to the programme. They will have to follow some homologation courses that are incorporated in their Master's programme.
 - c. Applicants with a Bachelor's degree other than BIT, TCS or TBK, awarded by *the University of Twente* may be admitted to the programme after completion of their Bachelor's and a pre-master's programme.

2. *Degree from a University of Applied Sciences (HBO)*

Students with a Bachelor's degree in a related field awarded by a HBO may be admitted to the programme after completion of their Bachelor's and a pre-master's programme.

The Admission Committee determines whether or not a pre-master's is awarded, based on:

- Academic record;
- Content of the Bachelor's programme;
- Proficiency in Mathematics B at pre-university education level (*Dutch: VWO*);
- Proficiency in English at pre-university level (*Dutch: VWO*);
- CGPA of at least 70%;
- Curriculum Vitae;
- Letter of motivation.

The following degrees are currently considered to be in a related field:

- Information Technology ('Informatica');
- Business IT & Management ('Bedrijfskundige Informatica').

3. Non-Dutch University Degree

The MBI Admission committee assesses international applicants with a Bachelor's degree awarded by a foreign Research University or University of Applied Science on an individual basis. The assessment of the applicant's competences is based on:

- Academic record;
 - NUFFIC credential evaluation;
 - Content of the degree (field related);
- Quality of level of Bachelor's programme;
- CGPA of at least 75% (3.0 on a 4-scale);
- English proficiency test report;
 - IELTS score with an overall band score of 6.5 or higher, or a
 - TOEFL internet-based (TOEFL-iBT) score of at least 90;
- Letter of motivation;
- Any additional information required by the Admission Committee.

4. Curriculum structure

Article 4.1 Composition of programme

The Master's programme on Business Information Technology consists of:

- Six mandatory core courses,
- Three alternative specializations with four mandatory courses each,
- Elective courses,
- Research topics,
- Final project.

The academic programme 2017-2018 is depicted in the next articles, showing the course code, course name, quartile and study load in EC.

More details are available via OSIRIS and/or are made known in a timely manner by the examiner in accordance with the provisions of Article 4, Section A.

Students can thus graduate with more than the minimum number of 120 ECs.

Article 4.2 Core courses

The choice of core courses followed from the conviction that all BIT Master's should understand the principles of IT strategy, business process management, enterprise architecture and business case development. Furthermore, all BIT Master's should understand and be able to apply the methods and techniques of design science, and should understand the principles of (computer-supported) cooperative work.

The core courses of the BIT Master's programme are the following:

Term	Code	Name	EC
M1-Q1	192350200	E-Strategizing	5
M1-Q1	192376500	Business Process Integration Lab	5
M1-Q2	201400277	Enterprise Architecture	5
M1-Q3	192320820	Design Science Methodology	5
M1-Q4	192340070	Computer Support Cooperative Work	5
M1-Q4	192376000	Business Case Development for IT-Projects	5

Article 4.3 Enterprise architecture (EA) specialization

In this specialization, courses on information systems and services have been selected. The course on Foundation of Information Systems is methodological, while the courses on Information Services, Architecture of Information Systems and Service-oriented Architecture with Web services are more system-oriented. These courses complement each other and cover the main techniques and systems for enterprise architectures.

Term	Code	Name	EC
M1-Q1	191863960	Foundations of Information Systems	5
M1-Q2	201100051	Information Services	5
M1-Q3	192652150	Service-oriented Architecture with Web services	5
M1-Q4	192320111	Architecture of Information Systems	5

Article 4.4 IT Management and Innovation (ITMI) specialization

In this specialization, courses related to the application and management of ICT in organizations have been selected, with the exception of the course on Software Management, which is oriented towards the software development process and software quality. The course on E-commerce contributes to the innovation aspect of this specialization. In this specialization, the students learn techniques that are applicable in (large) IT and software development projects.

Term	Code	Name	EC
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M1-Q2	192320501	Electronic Commerce	5
M1-Q3	192360021	ICT Management	5
M1-Q3	192340101	Implementation of IT in Organizations	5
M1-Q4	192340041	Software Management	5

Article 4.5 Data Science & Business (DSB) specialization

In this specialization, courses have been selected to cover the methods and techniques necessary to prepare the students to perform business analysis by exploring and reasoning on large amounts of data.

Term	Code	Name	EC
M1-Q1	191506103	Statistics and Probability	5
M1-Q1+2	191820210	Simulation	5
M1-Q2	201200044	Managing Big Data	5
M1-Q2 / Q3	201400174	Data Science	5

Article 4.6 Electives

In addition to the 50 EC that are determined by the core and the specialization courses, the students spend 30 EC on elective courses.

In order to guarantee the scientific depth of the programme, a student can only take up an internship of 20 EC **OR** join the study tour for 10 EC. The courses listed below can be chosen by the students as elective courses. A student needs to ask for permission of the Examination Board to follow a course that is not in this list. In case a student follows a course that is not in this list without prior approval of the Examination Board, the credits from this particular course do not count in his/her programme.

Term	Code	Name	EC
ALL YEAR	201300059	Internship BIT	20
ALL YEAR	201200148	Study Tour	10
S1	192320220	Advanced Architecture of Information Systems	10
S1	191820210	Simulation	5
Q1	191863960	Foundations of Information Systems	5
Q1	192111332	Design of Software Architectures	5
Q1	192320601	Multi agent systems	5
Q1	195810200	Supply Chain Management & ICT	7,5
Q1	191506103	Statistics and Probability	5
Q1	201200008	Accounting & Financial Management	5

Q1	201400171	Capita Selecta Software Technology	5
Q1	201300075	Management of Organizations, Operations and Technological Innovation	5
S1	201200180	Seminar Digital Society in 2020 ²	5
Q2	192135450	ADSA: Model Driven Engineering	5
Q2	194108040	Business Development in Network Perspectives	5
Q2	191612680	Computer Ethics	5
Q2	192320501	E-commerce	5
Q2	201100051	Information Services	5
Q2	201200044	Managing Big Data	5
Q2	201500018	Cybersecurity Management	5
Q2 or Q3	201400174	Data Science	5
Q3	201100126	Human Computer Interaction	5
Q3	201600155	Global Strategy and Business Development	5
Q3	192652150	Service-oriented Architecture Web Services	5
Q3	192340101	Implementation of IT in Organizations	5
Q3	192360021	ICT Management	5
Q3	201500088	HRM and Technology Design	5
Q4	192320111	Architecture of Information Systems	5
Q4	192340041	Software Management	5
Q4	192360501	E-health strategies	5
Q4	194105070	Information Systems for the Financial Services Industry	5
Q4	201500038	E-law	5

Internship and international cooperation

The research groups that contribute to the MBI courses have contacts with foreign universities and research institutions. Students interested in studying abroad can make use of these contacts. For more information on studying abroad and the internship, see: <http://www.utwente.nl/en/eemcs/traineeship>

Capita Selecta

Students who want to perform a Capita Selecta in their programme have to ask permission from the Examination Board in advance. Some of the criteria the Examination Board will apply to approve a Capita Selecta are:

- The contents and objectives should not overlap too much with any of the available courses, unless following an available course is not practically possible at a certain moment.
- The Capita Selecta should contribute to the programme intended learning outcomes.
- The Capita Selecta should meet the level requirements of the programme.
- The study load for the Capita Selecta must match the number of ECs the student will obtain after completing the Capita Selecta.
- The student needs to find a suitable examiner to support the Selecta Capita Selecta proposal and supervise the learning activities.
- A Capita Selecta can only be requested when there is no other way to meet some BIT-specific training needs of the student.

Article 4.7 Research Topics

Students need to take the course Research Topics BIT (201300058) before starting the Master's final project. During this course the students get acquainted with a research area as a preparation for the Master's final project.

Term	Code	Name	EC
ALL YEAR	201300058	Research Topics BIT	10

More information on the Research Topics can be found at http://www.utwente.nl/mbit/final_project.

Article 4.8 Final Project

The Final Project is scheduled in the second semester of the second year of the Master's programme.

Term	Code	Name	EC
ALL YEAR	192399979	Final Project BIT	30

The final project is a 30-credit study activity to be completed over a half-year period, which rounds up the Master's programme. The final project is a research and/or development exercise. The final project may be developed and implemented internally (within the UT), but it may also involve a commissioned assignment from a company or another higher education institution. Some projects are performed abroad.

The final project can be seen as an individual 'Master's assessment test'. After successfully completing the project, the student demonstrates that he/she deserves the Master of Science qualification. In the final project, the student's competence in the integrated application of knowledge, comprehension and skills covered in the earlier study units is assessed. Although the assignment focuses on a specified field of study, the project is assessed on the basis of a number of well-defined generic criteria.

To conclude the project, the student submits a written report (the 'Master thesis') and delivers an oral presentation about the project, addressing both its implementation and the results generated. The Examination Board prescribes an assessment form for the final project to help ensure the homogeneity and transparency of the assessment.

If a student expects to exceed his intended completion date, he is required to submit a motivated request for delay to the examination board.

The final project committee consists of at least two supervisors: one from the BMS faculty and one from the EEMCS faculty, stressing the Business and IT signatures of the programme.

Further information on the final project can be found in the Final Project Manual at www.utwente.nl/mbit/final_project/.

5. Approval of programme

Students must draw up their individual study programme and have this approved and signed by the programme coordinator. The signed and approved copy must be handed in at the education administration before the third quarter of their first year.

6. Degree

Students who have successfully completed their Master's final examination are awarded a Master of Science degree. The degree awarded is stated on the diploma.

7. Transitional and final provisions

Article 7.1 Transitional provisions

Notwithstanding the current Teaching and Examination Regulations, the following transitional provisions apply for students who started the programme under a previous set of Teaching and Examination Regulations:

1. Regulation 2016-2017 regarding the course 192320850 Advanced Requirements Engineering

Occasion: The course 192320850 Advanced Requirements Engineering will not be offered in 2016-2017.

Term of validity for this rule: until September 1, 2017

Students are allowed to replace the course 192320850 Advanced Requirements Engineering with the course 201400171 Capita Selecta Software Technology.

2. Regulation 2016-2017 regarding the course 192330301 Specification of Information Systems

Occasion: As of 2016 this course will no longer be offered.

Term of validity for this rule: unlimited, starting September 1, 2017

Students who need to do this course as a mandatory part of their programme will have to replace this course with 192652150 Service-oriented Architecture with Web services.

Article 7.2 Publication

1. The Dean will ensure the appropriate publication of these Regulations and any amendments to them.
2. The Teaching and Examination Regulations will be posted on the faculty and programme website.

Article 7.3 Effective date

These Regulations enter into force with effect from 1 September 2017.