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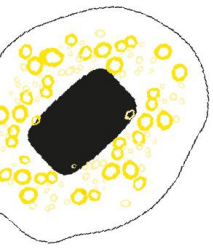
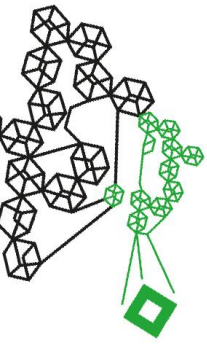


Programme-specific part to the Education and Examination Regulations (EER) 2026-2027

For the Bachelor (of Science) programme

Industrial Engineering and Management science (B-IEM)



Contents

1. General provisions 4
1.1. Admission to the programme 4
1.2. Language of the programme 4
1.3. Connecting Master programme(s) 4
1.4. Rights, duties and composition of the programme committee 4
2. Contents and structure of the programme 5
2.1. Contents and structure of the programme 5
2.2. Study load 5
2.3. Programme-specific characteristics 7
2.4. Honours programme 7
2.5. Elective options 7
2.6. Joint/double degrees and/or international cooperation and agreement(s) 7
2.7. Pre-master's programme 8
3. Programme objectives and intended learning outcomes 9
3.1. Programme objectives 9
3.2. Intended learning outcomes 9
4. Assessment/examination 12
4.1. Final examination 12
4.2. Assessment format examinations/tests 12
4.3. Period of validity of test results 13
4.4. Maximum number of attempts for tests/examinations 13
4.5. Specific pass-fail regulations 13
4.6. Prerequisites / required sequence of examinations 14
4.7. Examination board 15
4.7.1. Exceptions to the handling of requests by the EB-MS 15
4.8. Evaluation of Education 16
5. Transitional arrangements 17
5.1. TEM1.0 to TEM2.0 17
5.2. PAD M5 and M7 (202000414/202000423) 17
5.3. Module 6 17
5.4. Module 1 18

6. Other topics 19
6.1. (Binding) recommendation on continuation of studies 19
6.2. Graduation with distinction 19
6.3. Arrangements for taking two bachelors at the same time 20
6.4. Overlap of math study units 20
6.5. Transferring from BIT to IEM 21
6.6. Joining study units by students from other programmes 22
6.7. Overview of Changes 22

1. General provisions

1.1. Admission to the programme

Students can be admitted to the B-IEM programme with:

- VWO with Mathematics B

Or:

- Certificate equivalent to Dutch VWO (e.g. British A-levels, International Baccalaureate), and:
- English (CEFR, B2/C1 level; IELTS 6.0, TOEFL iBT 80 or Cambridge C1/CAE or C2/CPE), and:
- Mathematics equivalent to Mathematics B on VWO level.

Admission to the programme is limited to Module 1 and Module 2 and limited to the first two weeks after the start of Module 1 and to the first week after the start of Module 2.

Admission requirements for students transferring from other programmes, or students who want to take separate courses instead of full modules are stated in Section 6.

1.2. Language of the programme

The B-IEM programme is taught in English. All course materials (textbooks, readers, etc.) and assessments are in English.

1.3. Connecting Master programme(s)

Successfully completing the B-IEM programme automatically qualifies a student for immediate admission to the MSc programme Industrial Engineering and Management.

1.4. Rights, duties and composition of the programme committee

In line with article 9.18 WHW, each programme has a programme committee, which has the duty to advise programme management on improving and safeguarding the quality of the programme. It has a right of consent regarding a number of topics in the Education and Examination Regulations (EER), e.g. the goals and intended learning outcomes of the programme in terms of knowledge, insight and skills that a student should have acquired at the end of the programme; where necessary the layout of practical exercises; the study load of the programme and its study units. In addition, the programme committee evaluates on a yearly basis the manner in which the EER has been carried out and has the right to advise programme management and the dean – invited or uninvited – on all matters relating to the teaching in the programme.

The composition of the current programme committee can be found here:
https://www.utwente.nl/en/iem/programme-committee/

2. Contents and structure of the programme

2.1. Contents and structure of the programme

In the Twente Educational Model (TEM) on which the B-IEM curriculum is based, practical exercises and relations with the work field play an important role, especially in the form of a project (or sometimes several small projects) that is at the heart of each module. The programme therefore consists of 12 themed modules of which the first eight modules are the core of the programme. The two first modules of the third year (semester 5) are electives for broadening or deepening knowledge, skills, and attitude, and for studying abroad. The two last modules of the programme (semester 6) are the preparation and the execution of the bachelor thesis assignment in which the student shows to master all programme intended learning outcomes.

Each module consists of various study units (see Table 1), which are logically clustered around a particular topic in such a way that the offered knowledge, skills and attitude of different scientific disciplines and approaches are applied in cases, assignments and/or the project. Students work in groups on project-oriented assignments and gain new knowledge rather independently (under the support and supervision of tutors and lecturers). The students receive input from lecturers through a variety of educational formats, both face-to-face and in a hybrid combination with digital and online tools. Such a teaching approach requires a variety of assessment methods – individual and group assignments, individual written tests, group papers and presentations, etc. - which are applied in different phases in each module. More detailed information on the educational and exam formats, including the test plan, can be found in the module descriptions, in Osiris and on the Canvas site of the module. Note that participating in the practical exercises is mandatory unless specified otherwise in the module test plan.

Additional to the core IEM programme (Modules 1 to 8) and the graduation Modules (M11 and M12), the programme organises two minor modules: 202100021 Aerospace Management & Operations and 202200096 Circular Economy Transition. These modules are not part of the B-IEM curriculum but are part of the minor portfolio offered by the UT.

2.2. Study load

The programme has a study load of 180 EC[1] divided over three academic years (B1, B2 and B3) of 60 EC each. The B-IEM programme is compiled of 4 themed modules per year. Each module consists of a varying number of study units, adding up to of 15 EC (420 hours). For an overview of the study load per study unit, see Table 1.

[1] For definitions of terms and abbreviations used in this document see Article 1.2 of the Guideline and Model Education and Examination Regulation Bachelor Programmes (EER) of BMS

Table 1

Overview of the study units per module, their allocated EC, and their place in the years (B1, B2 and B3) and Quartiles (Q1, Q2, Q3 and Q4). Not all modules are organised by the IEM programme. Module 6 is organised by the Industrial Design Engineering (B-ID) programme, Modules 3, 5 and 7 are shared with Business and Information Technology (B-BIT) programme. See Section 4.7 for the consequences this has on the responsibilities of the examination board. Modules 9 and 10 are free to choose, see Section 2.3.

BSc Industrial Engineering and Management Study Programme 2026 - 2027							
	Course code	Course name	EC		Course code	Course name	EC
IEM Year 1	202000390	**Module 1: Introduction to IEM**	15		202000395	**Module 2: Operations Management**	15
	202001193	Intro to Mathematics + Calculus 1A	4		202001200	Calculus 1B	3
	202100391	Probability	3		202000396	Operations Research	3
	202600297	Data Analysis and Computational Thinking	3		202000397	Operations Strategy	3
	202600296	IEM Project M1	3		202000398	Project Operations Management	4
	202100394	Professional and Academic Development M1	2		202000399	Professional and Academic Development M2	2
	202300240	**Module 3: Business and Process Analytics**	15		202000405	**Module 4: Supply Chain Management**	15
	202100283	Statistics	3		202001222	Calculus 2	3
	202300241	Business Intelligence and Databases	2.5		202000406	Statistics	3
	202300242	Business Process Management	2.5		202000407	Demand Supply Planning and Inventory Mgmt	3
	202400724	Business and Process Analytics Project	4		202300335	Sourcing, Supply Network Design and Transport	2.5
	202400451	Professional and Academic Development M3	3		202400760	Business Game	3.5
IEM Year 2	202000410	**Module 5: Finance for Engineers**	15		202000415	**Module 6: Consumer Products**	15
	202000411	Accounting and Finance	3.5		202000416	Technical Product Modelling	2.5
	202000412	Option Pricing	2.5		202500417	Production	4.5
	202000413	Project Finance for Engineers	6		202500418	Sustainable Supply Chains for Consumer Products	3
	202500250	Introduction to Python Programming	1.5		202500480	Project Multidisciplinary Product	5
	202500259	Professional and Academic Development M5	1.5				
	202500467	**Module 7: Managing complex innovations and systems**	15		202000424	**Module 8: Modelling and Analysis of Stochastic Processes**	15
	202001207	Linear Algebra	3		202300328	Stochastic Models	5
	202500468	Systems Engineering	2.5		202000427	Simulation and Heuristics	3
	202500469	Assessing and Optimizing Complex Innvations	2.5		202400751	Project MASP	7
	202500470	Capacity Management	3				
	202500471	Digital Transformation	3				
	202500472	Professional and Academic Development M7	1				
IEM Year 3		**Module 9: Free choice**	15			**Module 10: Free Choice**	15
		Minor or study abroad				*Minor or study abroad*	
	202000430	**Module 11: Thesis Preparation**	15		202000433	**Module 12: Bachelor Thesis IEM**	15
	202500444	Project Plan	10		202000434	Bsc Research Assignment	15
	202000432	Professional and Academic Development M11	5				

2.3. Programme-specific characteristics

B-IEM is a fulltime programme. The programme consists of:

- A major: 8 core modules and two graduation modules;
- A minor: two elective modules, scheduled in the first semester of the third year. The minor can be taken at the University of Twente, other universities in the Netherlands, or abroad.

2.4. Honours programme

Students obtaining excellent results will be invited for participation in the University excellence honours programmes for broadening their knowledge. These programmes offer additional education to the programme. Participation means extra study load. Finalizing the excellence programme will be noted on the diploma supplement. Recommendation for participation is mandated to the academic counsellor. For extra information, see https://www.utwente.nl/en/honours/.

2.5. Elective options

In year 3, students can choose the content of the two 15 EC minor modules. Students can study abroad within their minor space. Students can also choose to take courses at any university in the Netherlands. Minors offered at the UT are:

- High Tech Human Touch minors;
- Crossing Borders minor;
- Join-in minors;
- Transfer minors (premaster);
- The 'Leren lesgeven' minor (in Dutch only).

Students can participate in UT minors without approval of the examination board or the programme director. Prerequisite is that the student follows a minor module completely as offered, all 15 EC. Minor modules may have admission requirements that students must comply with. For more information see the website.

Students are not allowed to take courses that are part of the M-IEM programme.

2.6. Joint/double degrees and/or international cooperation and agreement(s)

The B-IEM programme is designed to give students the option to study abroad without study delays. Students can use the international exchange programme contacts from all over the

world, to find their most suitable fit to gain the required knowledge and experiences. The options for an international experience are:

- Study abroad: In the first semester of the third-year students can choose for a semester (30 EC) study abroad (exchange) at partner universities. A coherent and thematic package of courses is compiled by the student and approved on by the academic counsellor. Arrangements for study abroad at non-partner universities are subject to special procedures and requirements as specified on the UT study abroad website, https://www.utwente.nl/en/study-abroad/. Detailed information on Faculty level can be found on the website https://www.utwente.nl/en/bms/education/study-abroad/ and the BMS Study Abroad Canvas site;
- The minor 'Crossing borders' gives students the opportunity to go abroad for a field study or a study tour. For more information see https://www.utwente.nl/minor/;
- Executing a bachelor thesis project abroad. Students can organise a thesis project on their own initiative. The thesis project needs approval from the supervisor before the start of the project execution.

2.7. Pre-master's programme

Not applicable to the B-IEM programme

3. Programme objectives and intended learning outcomes

3.1. Programme objectives

As envisioned in UT's 'High Tech Human Touch' vision, B-IEM particularly focuses on organisational problems in contexts with high societal relevance. B-IEM students can analyse the root causes, can design solutions, can prospectively assess solutions in a (optimisation/simulation/analytical) model, and can implement the outcomes in situations where typically they need to work together with people from various other disciplines. B-IEM graduates specifically are able to support scientific decision making, by choosing a method that fits the problem, which means that they combine quantitative and problem-solving approaches of engineers with research methods and qualitative insights from the social sciences.

The first year has been designed to provide a realistic experience of B-IEM and to give the student insight in the suitability (*level*, *effort*, and *orientation*). Students get acquainted with all B-IEM domains. The focus is on developing students' maturity through development of meta-cognitive competences such as planning, researching literature, and reflection. In the second year the students continue to broaden their knowledge and skills in various real-life HTHT projects. Since various modules are shared between programmes, students have to work in multidisciplinary teams and on external projects. The third year gives room for a student's personal ambition and personal choices. Students can broaden or deepen their personal interest by choosing a UT minor. Students can also choose courses outside UT, from (inter)national programmes to be approved by the programme management.

The programme leads to a T-shaped profile of BSc graduates with high level academic and professional skills. In support of the horizontal bar of the 'T', all UT students have education dedicated to reflection on science and corporate and social responsibility in their BSc programme. Also, the B-IEM programme shares the math learning line with other engineering programmes.

3.2. Intended learning outcomes

The ILOs (or the so-called Final Qualifications) of the B-IEM programme correspond with the requirements formulated by comparable programmes in the Netherlands and abroad, and by professional practice. We distinguish two groups of competences: domain-specific and general competences. The general competences have a specific operationalisation: reflection, working in (multidisciplinary) teams, the preparation of student's lifelong learning, ethics and philosophy of science and Corporate Social Responsibility. Table 2 outlines the ILOs.

Table 2
Intended Learning Outcomes of the B-IEM programme.

	Professional Academic Qualifications BSc
	The graduate is able to identify, comprehend, assess, correctly apply, and integrate existing scientific knowledge that can be used for analysing problems and designing solutions, in the domains of: • Production and logistics; • Information systems; • Finance and accounting; • Other fields in business administration (law; marketing; human resources; entrepreneurship); • Mathematics, statistics, empirical research methods.
A1	*The student has a global overview of the **structure of research and design processes.*** The student is able to: • Identify the various steps in performed research and design • Properly break up own research and design activities into subprocesses These processes are intertwined: Research is needed for producing knowledge that is used for designing solutions in a specific context. Such knowledge is produced in a purposeful and methodical way (using scientific research methods). It may or may not be generalizable knowledge
A2	*The student has an overview of quantitative and qualitative **empirical research methods.*** The student is able to: • Analyse performed research as to the methodological aspects • Select an appropriate method and explain this choice for research to be performed • Apply this method in relatively simple cases
A3	*The student has an overview of quantitative **modelling techniques** for operational processes, specifically in the domains of* • Operations research models • Information systems models • Finance and accounting models The student is able to: • Analyse the results of modelling activities • Select an appropriate modelling technique and explain this choice • Apply this technique in relatively simple cases.
A4	*The student is able to **integrate** existing knowledge, modelling techniques, and research results for designing, validating, and selecting solutions in relatively simple cases.* This is challenging, because existing knowledge may not fully apply to a specific situation, models are always stylized, empirical research always has limitations, and some aspects have been left out of scope from the beginning anyway
A5	*The student has an overview of **implementation methods and processes**.* The student is able to: • (critically) Analyse ongoing or finished implementation processes • Plan globally an implementation process in a relatively simple case
A6	*The student has an overview of **evaluation methods and techniques**.* The student is able to: • Analyse the results of performed evaluations • Select appropriate evaluation methods and explain this choice • Carry out an evaluation in relatively simple cases

A7	*In order to be able to meet these competencies, the graduate must have mastered the following disciplines:* • Mathematics and statistics - [2] (see Legend) • Finance and accounting - [2] (see Legend) • Production and logistics - [2] (see Legend) • Information systems - [2] (see Legend) • Law, organisation theory, marketing - [1] (see Legend)
	General Academic Qualifications BSc
B1	*The student is able to **work autonomously and is self-reliant*** The student: • Is able to select and use appropriate time management techniques • Is able to select and apply appropriate principles of project management • Can perform complex assignments without detailed briefs and within given boundaries
B2	*The student is able to work in **multidisciplinary teams*** The student: • Can organize and structure meetings and has basic knowledge of decision-making techniques • Can adopt different roles within a team • Can reflect on the functioning of himself and others • Is able to give and receive effective feedback
B3	*The student is able to **communicate effectively,** in oral and written form, with various stakeholders* The student: • Can deliver a strong, valid, and scientific line of argumentation in a concise manner and an acceptable amount of time • Can explain various concepts and present data • Can give a presentation aimed at knowledge transfer with use of appropriate audio-visual means • Can design, conduct, and report an interview
B4	*The student is able to conduct a **bibliographic search** and knows how to reference correctly* The student: • Can systematically search for and select relevant scientific literature for projects and reports • Is able to properly use quotation and paraphrases • Is able to compile a relevant reference list in APA-style
B5	*The student is able to recognise and reflect on **ethical and societal** aspects in the IEM domain* The student: • Can identify and address General Data Protection Regulation and confidentiality issues • Can describe ethical implications of using research methods and technologies
B6	*The student is able to reflect on and direct **personal and professional behaviour and development*** The student: • Is able to analyse their own strengths and weaknesses and compose and execute a personal development plan • Is able to balance study and other activities with effective time management
B7	*Has enough basic knowledge and competencies to follow a broad range of MSc programmes that are adjacent to the IEM domain.*

Legend: [1] Knowledge of the basic concepts and principles, [2] Application in relatively simple and monodisciplinary cases, [3] Application in relatively simple interdisciplinary cases

4. Assessment/examination

4.1. Final examination

The final examination of the B-IEM programme consists of a research project in the form of a thesis. During the thesis graduation project, students have to work individually and independently on a chosen subject of professional relevance in a company or institution in the Netherlands or abroad. The graduation project is an individual and external research assignment, in which students have to show that they meet the programme intended learning outcomes. The graduation project involves the assessment of the total research process and of two deliverables, the bachelor thesis and the presentation and defence of the research outcomes (or *colloquium*). The student is academically supervised by two examiners and an external supervisor from the hosting company/organisation takes care of daily supervision. The lead or first UT examiner monitors the progress of the project. Together with a second UT examiner the work is graded. Only appointed B-IEM examiners are authorised to grade the project; however, the external supervisor is consulted as well. The final grade is based on the criteria of the detailed *Bachelor Project Assessment* form students receive when starting with their project.

The bachelor thesis is 15EC and must be finished (receive *'Green light'*[2]) within the nominal study time (10 weeks). Extra graduation project time can only be authorised by the programme director with a maximum of 50% (5 weeks). The programme director may consult the examiners and/or academic counsellors before reaching a decision. Reasons for delay can be:

- Insufficient level of and/or progress by the student;
- Insufficient (level of) supervision in the specific research topic;
- Special circumstances.

If a *Green Light* has not been obtained within the time set, the assignment may be graded as insufficient. The student then has to do a new assignment. The student can file an complaint at the complaints desk against the decision of the programme director. More information regarding the bachelor graduation project can be found on the IEM Programme Information Canvas site.

4.2. Assessment format examinations/tests

The exams of the study units within a module consist of a mixture of assessment methods. These include individual and group assessment (in various forms) of practical exercises, written

[2] The thesis is regarded by the examiners to be of sufficient quality to pass with a sufficient grade. *Green light* is given to finish the report and prepare the end presentation (colloquium).

and oral test, reports and different forms of presentations (poster, verbal, paper). Per module a balanced variation in methods is offered.

As stated in the EER Article 3.2, tests can be held remotely online with online surveillance or proctoring. Online-remote testing will only be allowed in individual cases when other options are not available and with permission of the Programme Management team and the examination board.

4.3. Period of validity of test results

As stated in Article 3.3 and Article 3.9 of the EER all study units with a grade of 6.0 and above after examination (one or multiple tests) are passed and these grades remain valid indefinitely[3]. All test results of a study unit that are registered in Osiris will remain valid indefinitely.

Students are allowed to retake passed study units. Exception to this rule are group projects and the skills parts of Professional and Academic Development.

4.4. Maximum number of attempts for tests/examinations

Students are allowed to take the same test at most twice a year.

4.5. Specific pass-fail regulations

Stochastic Models

A special conditional re-sit is offered for the study unit Stochastic Models (202300328) outside the quartile in which the study unit is taught (module 8). This extra test opportunity supports the progress of finalising the programme without study delay. A student qualifies for participation in this extra test opportunity if the student meets one of the conditions below:

- The student has passed all other study units in the IEM programme and successful completion of the degree depends on this one, single test
- The student did not take part in one of the original tests due to personal circumstances resulting in a study delay of six months or more when taking into consideration the required sequence of examinations (4.6)

Students must obtain approval from the academic counsellor to participate in the extra test opportunity. The IEM programme management team will decide when this extra test opportunity takes place.

[3] Note that for minor modules the rules of the organising programme/educational institute apply.

4.6. Prerequisites / required sequence of examinations

The formal sequence of the modules and their study units is the order as recorded in Table 1 (see Section 2.1). If a student is unable to exactly follow this sequence, an alternative study plan must be drafted together with the academic counsellor. The aim is for a student to make as much study progress as possible, taking into regard the following principles:

- Study units of previous years have priority, and;
- A student cannot do more than 20EC[4] per quartile, except when all the courses in the quartile have only individual exams and/or an individual assignment, and;
- A student is not allowed do more than one project in the same quartile.
- A student cannot take only the project component of a module in case the student did not take the other study units of the module before.

And additionally taking into regard the following prerequisites:

1. In case a student is, for any reason, unable or not allowed to take all study units from Module 8, but wants to take one or two study units from the module, a student must start with the study unit Stochastic Models (202300328). The study unit Simulation and Heuristics (202000427) is allowed in conjunction with, or after having already passed, Stochastic Models (202300328). A student is not allowed to take the project of Module 8 before taking or already having passed the study units Stochastic Models (202300328) and Simulation and Heuristics (202000427).
2. Prerequisite to start with the minor: at least 75 EC of the core IEM programme (Modules 1 to 8) has been finished
3. Prerequisites for Modules 11 and 12
    a. Prerequisite to start with the study unit Professional and Academic Development M11 (202000432): The student is in the third (or higher year) of enrolment in IEM and the prerequisites listed in the first paragraph of 4.6 are taken into account.
    b. Prerequisite to start with study unit Project Plan (202500444): The core IEM programme has been completed or at most two study units of the core IEM programme have not been completed.
        i. Exception 1: In case three study units of the core IEM programme have not been completed and at least one of these study units is in the same quartile as module 11, the student can start with the Project Plan in case the total does not exceed 20 EC or all study units are individual.
        ii. Exception 2: In case the student has no other study units to take in the quartile of Module 11 (M11), but does not fulfil the prerequisite to start with the Project Plan, the student can start with the Project Plan in case

[4] In case the assessment of a course takes place in another quartile than the teaching activities of the course, the ECs are counted in the quartile of the teaching activities. Honours programmes are not taken into account in this calculation.

at most 3 study units of the core IEM programme have not been completed. Note that in this situation it is allowed to start both Professional and Academic Development M11 (202000432) and the Project Plan (202500444). The following requirements apply in this situation:

1. The student will be able to start with Module 12 within at most one quartile from taking Module 11, and
2. The student must still fulfil the prerequisite for Module 11 before starting with Module 12 (i.e. at most two study units of the core IEM programme have not been completed

c. Prerequisite to start with Module 12: Formal approval from the thesis supervisor to start.
d. Prerequisite to finish Module 12: Study unit Project Plan (202500444) has been completed.

4.7. Examination board

The examination board is the body that determines in an objective and expert manner whether a student meets the conditions set under the Education and Examination Regulations (EER) concerning the knowledge, insight and skills required to obtain a degree. Members of the examination board are appointed by the dean of the faculty.

More information, including the most up-to-date composition of the examination board can be found at its website: https://www.utwente.nl/en/bms/examboard/ All information for students, examiners and educational support staff about the examination boards of BMS is published there, including their Rules and Guidelines, and the procedures and conditions for submitting a request.

4.7.1. Exceptions to the handling of requests by the EB-MS

As a consequence of the shared nature of Modules 3, 5 and 7, the examination board of IEM cooperates with the examination board of B-BIT regarding these modules. This means:

- Student requests and fraud cases regarding Module 3 are assessed by the B-BIT examination board[5];
- Student requests and fraud cases regarding Modules 5 and 7 are assessed by the B-IEM examination board;

[5] https://www.utwente.nl/en/eemcs/education/examination-board/

If needed, both examination boards will discuss cases. Furthermore, Module 6 is fully organised by B-ID; requests regarding that module should be directed at B-ID's examination board[6]. Fraud cases within Module 6 are handled by the examination board of B-ID.

4.8. Evaluation of Education

The education in the programme is evaluated via the internal quality assurance system based on the Plan-Do-Check-Act cycle. This includes panel meetings, course surveys and assessment screenings.

[6] https://www.utwente.nl/en/intranet/id-exam-board/

5. Transitional arrangements

5.1. TEM1.0 to TEM2.0

As the transfer arrangement of 2020-2021 stated, not finished modules from TEM 1.0 have been transferred to TEM 2.0 as of September 1st 2021. There is one exception; it will be allowed to repair math in the TEM1.0 module indefinitely if a student meets the following conditions:

- If a student was allowed to repair a math study unit in Modules 1, 2, 4 or 7 and failed to do so;
- And if transitioning the module grades to TEM2.0 means that validity of grades that have been granted in 2019 would expire, e.g., where due to compensation an insufficient score was allowed.

5.2. PAD M5 and M7 (202000414/202000423)

In 2025/2026, the PAD study units in modules 5 and 7 were replaced.

In 2024/2025, the PAD M5 component consisted of skills (0.5 EC) and research methodology (2.5 EC). The research methodology component was moved to PAD M3. Students who have to retake the research methodology part, can take the research methodology of PAD M3. The result will be registered under the old course code. For the skills parts of both PAD M5 (0.5 EC) and PAD M7 (1 EC), students will be allowed to retake these components in the academic year 25/26. Results will be registered on the old course codes. After the academic year 25/26, students who still have to finish the skills parts may need to replace the study units containing these skills parts with courses selected by the programme management.

5.3. Module 6

In 2025/2026, the production 1 course (202000181) is expanded from 2.5 EC to 4.5 EC. The theory exam of 2.5 EC will remain to exist. Students who have to retake this course can take the theory exam and the results will be registered under the old course code.

The course Sustainable Supply Chains for Consumer Products (202000418) is expanded from 2 EC to 3 EC. In 2025/2026, the old exam will be offered for students who have to retake the course and results will be registered under the old course code. From 2026/2027 onwards, retaking students will have to take the new course of 3 EC instead.

The course Project Consumer Products (202000417) will be reduced from 8 EC to 5 EC. In the 8 EC course, the course Product-Market Relations (202000205) was part of the study unit. The course Product-Market Relations is replaced by Market Research (202500221). Students who have to finish (parts of) the Product-Market Relations course, can take the Market Research course instead.

5.4. Module 1

To correct for the workload in relation to the ECs of VBA Programming (202400550, 2 EC) and Project and Core IEM Topics (202500261, 4 EC), new study units have been created in 2026/2027: Data Analysis and Computational Thinking (202600297, 3 EC) and Project and Core IEM Topics (202600296, 3 EC). For students retaking VBA Programming only, the course Data Analysis and Computational Thinking can be followed and results will be registered under the old course code. Students who have to retake both study units, will take the new study units.

6. Other topics

6.1. (Binding) recommendation on continuation of studies

As formulated in the EER, Article 6.2, students receive during the first year a *(binding) recommendation on the continuation of study* (or Binding Study Advice - BSA) from the programme director. This BSA is based on the number of successfully obtained EC together with the advice of the academic counsellor. A student who receives a negative BSA cannot enrol in the B-IEM programme in the next three academic years. A positive study advice at the end of the first year is given if the student meets the criteria below.

To receive a positive BSA, he student has successfully finished **45EC (or more)** of the first-year study load with the following additional criteria:

1. At least **two modules** have been finished completely;
2. At least **five out of the eight** study units mentioned below have been passed:
    a. 202001193 Intro to Mathematics + Calculus 1A
    b. 202600297 Data Analysis and Computational Thinking
    c. 202001200 Calculus 1B
    d. 202000396 Operations Research
    e. 202100283 Statistics
    f. 202001222 Calculus 2
    g. 202000406 Statistics
    h. 202000407 Demand Supply Planning and Inventory Management

The programme director has to approve the positive BSA on the continuation of studies. If a student disenrolls before February 1st, the student is not allowed to enrol in B-IEM modules until the next academic year.

6.2. Graduation with distinction

The B-IEM programme has a regulation for graduating with distinction. If during the bachelor's examination, the student has given evidence of exceptional capability, 'cum laude' (with distinction) will be recorded on the degree certificate. A student is considered to have exceptional capability if each of the following conditions is met:

a) The unrounded weighted average of individually tested Study Units of Modules 1 to 8 and 11 (and including *Business Intelligence and Databases (202000402)* and *Business Process Management (202000403)* of Module 3 and *Systems Engineering (202500468) and Assessing*

and Optimizing Complex Innovations (202500469) of Module 7, if applicable) is at least 8[7]. In this average the number of EC determines the weight of the study unit[8];

b) The bachelor programme has been finished within nominal time plus 25% (i.e., 45 months) [9];
c) The Bachelor Thesis has been completed with at least an 8.0;
d) The student has not committed fraud during the entire duration of the programme, as evidenced by the fraud registry of the examination board management sciences.

In exceptional cases the examination board may grant the designation of 'graduation with distinction' if the conditions mentioned above have not been fully met. The rules applied by the examination board can be found in the Rules & Regulations of the examination board.

6.3. Arrangements for taking two bachelors at the same time

It is possible to do a second bachelor programme while doing B-IEM. In case of combining multiple bachelor programmes, it is allowed to use modules from other programmes in the minor space (see 2.5), after consulting the academic counsellor. A full, 15EC thesis is always required to finish the IEM programme. Students need to contact their academic counsellor when considering taking two bachelors at the same time.

6.4. Overlap of math study units

Due to changing to B-IEM from another study programme or by choosing a minor module, an overlap in the math study units shared with the other engineering programmes may occur (see Table 3). There are two options to resolve the overlap:

1. The student transfers to B-IEM with an overlapping study unit in the original module but decides not to use the original module as a minor: an exemption can be granted for the math study unit in the IEM programme according to Table 3. The original module can no longer be used as a minor module.
2. The student wants to use the finished module with overlap as a minor: the student must take a replacement study unit, with permission of the academic counsellor, replacing the math study unit in the B-IEM module. A list of replacement study units is available from the academic counsellors.

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[7] I.e., the projects of Modules 1, 2, 3, 4, 5, 6, 7, and 8 and the skills parts of *Professional and Academic Development* are excluded from this calculation

[8] The weight of *Professional and Academic Development* is determined by the number of EC of the sub-tests that are graded numerically

[9] A full-time board year is excluded from the nominal study load for cum laude in case a student did not take any examination that year, including retakes and/or resits

In any other case it is not allowed for B-IEM students to take a math study unit as listed in Table 3 as a replacement of a math study unit in the B-IEM programme.

In the unlikely case the overlapping study unit is part of an integrated module of another programme, the situation will be assessed individually by the programme management.

Table 3
Overview of the corresponding math study units per IEM module.

IEM Module 1		**IEM Module 2**		**IEM Module 4**		**IEM Module 7**	
202001193	**Intro. to Math. + Calculus 1A for IEM**	**202001200**	**Calculus 1B for IEM**	**202001222**	**Calculus 2 for IEM**	**202001207**	**Linear Algebra for IEM**
202001187	Intro. to Math. + Calculus 1A for BIT	202001194	Calculus 1B for BIT	202001218	Calculus 2 for ME	202001202	Linear Algebra for BIT
202001188	Intro. to Math. + Calculus 1A for BMT	202001195	Calculus 1B for BMT	202001219	Calculus 2 for BMT	202001203	Linear Algebra for BMT
202001189	Intro. to Math. + Calculus 1A for CE	202001196	Calculus 1B for CE	202001220	Calculus 2 for CE	202001204	Linear Algebra for CE
202001190	Intro. to Math. + Calculus 1A for TCS	202001197	Calculus 1B for TCS	202001221	Calculus 2 for CSE	202001205	Linear Algebra for TCS
202001191	Intro. to Math. + Calculus 1A for CSE	202001198	Calculus 1B for CSE			202001206	Linear Algebra for CSE
202001192	Intro. to Math. + Calculus 1A for IDE	202001199	Calculus 1B for IDE			202001208	Linear Algebra for AT
		202001201	Calculus 1B for ME			202001209	Linear Algebra for EE
						202001210	Linear Algebra for ME
						202001211	Linear Algebra for TN
						202001237	Linear Algebra for IDE

6.5. Transferring from BIT to IEM

The B-IEM programme works closely together with the B-BIT programme. The programmes share various study units. Students who wish to transfer from B-BIT to B-IEM may be eligible for exemptions for the overlapping study units/tests in the B-IEM programme, as listed in Table 4. The student has to discuss this with the academic counsellor. Exemptions are granted on an individual basis by the examination board.

Table 4
Overview of corresponding study units of the BIT and IEM programmes.

BIT Study Unit		**EC**	**IEM Study Unit**		**EC**
			B1		
202001233	Probability Theory	3	202100391	Probability	3
202300241	Business Intelligence and Databases	2,5	202300241	Business Intelligence and Databases	2,5
202300242	Business Process Management	2,5	202300242	Business Process Management	2,5
202400724	Business and Process Analytics Project	4	202400724	Business and Process Analytics Project	4
			B2		
202000411	Accounting and Finance	3,5	202000411	Accounting and Finance	3,5
202000412	Option Pricing	2,5	202000412	Option Pricing	2,5
202000413	Project Finance for Engineers	6	202000413	Project Finance for Engineers	6

In addition to the overview in the table, the Research Methods study units of BIT (202100155 and 202001070) are identical to the research methodology parts of the Professional and Academic Development M1 and M3 study units (202100394 and 202400451). Exemptions may be granted for these parts. Furthermore, the study unit Computational Thinking with Python (202500203) has a part on Python Programming. This part is shared with the course Introduction in Python Programming in IEM Module 5. Therefore, a sufficient result in the BIT course may lead to an exemption for this IEM course.

6.6. Joining study units by students from other programmes

Table 5 lists the study units from the B-IEM programme open to enrolment for students from other UT programmes. Before joining a study unit, students need to contact the IEM programme coordinator who will check if the prerequisites have been met. International exchange students are advised to do whole modules if possible.

Table 5
Overview of study units available to students from other programmes

Q1	**Module 1 Introduction to IEM**	**EC**	**Prerequisites**
202100391	Probability	3	none
202600297	Data Analysis and Computational Thinking	3	none
Q1	**Module 5 Finance for Engineers**		**Minor module, only accessible as full minor module**
Q2	**Module 2 Operations Management**	**EC**	**Prerequisites**
202000396	Operations Research	3	Basic Probability Theory (M1-IEM)
202000397	Operations Strategy	3	none
Q2	**Module 6 Consumer Products**	**EC**	**Prerequisites**
202500418	Sustainable Supply Chains for Consumer Products	**3**	none
Q3	**Module 3 Business Intelligence and IT**	**EC**	**Prerequisites**
202100283	Statistics	3	Basic Probability Theory (M1-IEM)
Q3	**Module 7 Managing complex innovations and systems**	**EC**	**Minor module, only accessible as full minor module.** Requires Basic Probability Theory (M1-IEM)
Q4	**Module 4 Supply Chain Management**	**EC**	**Minor module, only accessible as full minor module (OR knowledge required)**
Q4	**Module 8 Modelling and Analysis of Stochastic Processes**	**EC**	**Minor module, only accessible as full minor module (OR knowledge required)**

6.7. Overview of Changes

5.4: Added new transitional arrangement for module 1

6.2: Added new Module 7 courses with group work in cum laude chapter