Examination Policy

School of Industrial Engineering

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Examinations Committee IE / Halsema, L., Van der Geer-Rutten-Rijswijk, E.
TU/e
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Introduction

The School of Industrial Engineering comprises three educational programs. The table below gives a list of the school’s educational programs and the responsible Exam Committee (EC).

<table>
<thead>
<tr>
<th>CROHO educational programs</th>
<th>Bachelor College</th>
<th>Graduate Program</th>
<th>Exam Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc Industrial Engineering (TBdk)</td>
<td>Major Industrial Engineering (IE)</td>
<td>Graduate Program Industrial Engineering (IE)</td>
<td>EC IE</td>
</tr>
<tr>
<td>MSc Operations Management &amp; Logistics (OML)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSc Innovation Management (IM)</td>
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</tbody>
</table>

This policy paper has been drawn up based on the examination policy format as indicated in the TU/e Examination Policy. In this examination policy the School of IE presents its vision on education and examinations (Section 1). Section 2 covers quality assurance of examinations, and Section 3 discusses quality assurance of the final educational level of students.

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1. Vision on the organization of education and examinations at IE&IS

The School of IE presents its vision on education in the document ‘Educational Concept for the IE&IS Department’. This document has been updated on several occasions. In addition, the department follows the guidelines of the Bachelor College and Graduate School.

The examinations policy as described in this document is based on documents about quality assurance in relation to examinations, which have been drawn up in recent years by the IE&IS educational management and/or by the Exam Committee. This examination policy document has been drawn up by the IE&IS educational management and submitted for review to the IE Curriculum Committee. It has been confirmed by the Exam Committee and Departmental Board of IE&IS.

1.1 Educational vision of the School of IE

Learning outcomes

Learning outcomes (or exit qualifications) play a central role in the design of the educational programs of the School of IE. Learning outcomes specify the knowledge, skills and attitude that a student should have acquired on completion of the program. The learning outcomes of the programs are defined on the basis of the demands that are made on an academic engineer. These demands are based mainly on international benchmarks, the interrelationships between education and research, and contacts with industry. At the start of the design of the major courses and Master’s programs, there was a consultation round with the various parties involved to define clear and broadly supported learning outcomes. Discussions with organizations in industry, alumni and (international) researchers have led to a first set of learning outcomes. In case of changes in the environment or internal changes, the learning outcomes are updated in consultation with the parties involved.

The learning outcomes of the IE programs are assessed against the 3TU Criteria for Academic Bachelor’s and Master’s Curricula, as shown in the table below.

<table>
<thead>
<tr>
<th>ACQA Competence area</th>
<th>BSc IE</th>
<th>MSc OML and IM</th>
</tr>
</thead>
<tbody>
<tr>
<td>scientific disciplines</td>
<td>The graduate bases his/her choices in analysis and design on academic knowledge from several disciplines. The graduate is able to apply his/her multidisciplinary knowledge and insight under supervision to structure and analyze complex, business problems, with the aim to systematically improve business processes in industrial and service organizations.</td>
<td>The graduate is an engineer who has thorough mastery of the state-of-the art scientific knowledge and insight on the design, behavior, and performance of operational processes in industrial and service organizations, or of innovation processes. The graduate is capable of independently identifying and supplementing any lack of knowledge.</td>
</tr>
<tr>
<td>doing research</td>
<td>The graduate is able to carry out an analysis in a structured and reproducible manner; using a careful and well-founded selection of theoretical models and research methods.</td>
<td>The graduate has research skills to independently conduct studies that meet academic standards.</td>
</tr>
<tr>
<td>designing</td>
<td>The graduate is able to determine how the</td>
<td>The graduate is capable of modeling and</td>
</tr>
<tr>
<td><strong>performance of business processes changes as a function of changes in input. He/she can with supervision produce recommendations for (re)design and/or improvement of business processes.</strong></td>
<td><strong>(re)designing a complex business process, based on the results of a study, including specifications for the required information and the organizational context.</strong></td>
<td></td>
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<tr>
<td>---</td>
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<td></td>
</tr>
<tr>
<td><strong>scientific approach</strong></td>
<td>The graduate is able to behave systematically, he/she possesses the skills to develop and use theories, models and coherent interpretations. The graduate possesses the necessary learning skills to enable him/her to enter subsequent programs requiring substantial independence, such as PhD programs or postgraduate professional programs or courses.</td>
<td></td>
</tr>
<tr>
<td><strong>basic intellectual skills</strong></td>
<td>The graduate is able to reflect, think (with supervision) and has a critical attitude. The graduate possesses the necessary learning skills to enable him/her to enter subsequent programs requiring substantial independence, such as PhD programs or postgraduate professional programs or courses.</td>
<td></td>
</tr>
<tr>
<td><strong>co-operating and communicating</strong></td>
<td>The graduate is able to communicate (in writing and orally) clearly, unambiguously and in a professional manner in different contexts. He/she can operate independently and in interdisciplinary teams. The graduate has social skills to independently conduct studies that meet academic standards; is capable of operating independently and in teams, at an academic level; is able to operate effectively and efficiently in a multidisciplinary context; is able to communicate clearly and unambiguously both in industry and in academia, with non-specialists and specialists in the domain.</td>
<td></td>
</tr>
<tr>
<td><strong>temporal and social context</strong></td>
<td>The graduate is able to analyze ethical aspects and social and environmental consequences of scientific thinking and behavior. The graduate is aware of the relative importance of knowledge of scientific disciplines, and the societal impact of scientific knowledge (and vice versa);</td>
<td></td>
</tr>
</tbody>
</table>

**Translation of learning outcomes to learning goals and teaching forms**

Students develop exit qualifications throughout their BSc/MSc programs. This means that all courses contribute to gaining these learning outcomes. For this reason the content and goals of all courses are formulated in course descriptions. The learning goals of the courses describe what students have to know and the skills they have to gain after completing a course. Examinations are aimed at the learning goals which have been defined for the course.

To align the learning goals of the courses and the learning outcomes of the program, learning lines are defined in the BSc curriculum. These learning lines ensure that:

a. there is minimal overlap within a learning line during the program;
b. the qualifications are continuously developed;
c. the intended level is achieved at the end of the program.

The way in which the defined learning outcomes are reached is indicated step-by-step in a learning line.

It is important that there is agreement within the program on the content of the learning lines. The learning lines are defined in teams of lecturers (either from a single discipline or multidisciplinary) on the basis of the learning outcomes. A number of basic principles for the allocation of the learning goals among the different years of the BSc program are followed in defining the learning lines:

First year/level 1: typical teaching forms are lectures, instruction supervised self-study and assignments with feedback/tutorials.
- Goal: orientation, selection, but also providing basic knowledge and building an academic attitude;
- Structure: the focus initially is on relatively simple tasks, with more attention for the overall competence areas (generic);
- Level: a group of students is not yet able to work completely independently. They are often not yet able to independently plan and manage their study programs. This means that in this phase attention mainly has to be given to creating the basis for the further development of competences in later years (beginner’s level).

In the second and third year/levels 2 and 3: typical teaching forms are lectures, assignments with feedback/tutorials, internships and individual research (thesis).
- Goal: deepening knowledge, applying knowledge and developing skills and academic attitude;
- Structure: the tasks become more complex. The various aspects of competences are dealt with (specific);
- Level: more attention can gradually be given to working independently, which means the content of the program can become more student-focused (advanced level).

It is important that all academic competences (knowledge, skills and attitude) are covered without repetition throughout the program, in other words that they are in any case dealt with at beginner’s and advanced level. Courses consist of a mix of teaching forms.

In the MSc programs no formal learning lines are laid down in advance, because students choose one or more tracks and create their own learning path. The assignment of a mentor in an early stage in the MSc programs guarantees the coherence of the individual program, the optimal preparation for the MSc thesis and the attainment of the learning outcomes.

**Alignment of learning goals and examination forms**

In the BSc programs we distinguish three types of learning goals of a course:
1. Gaining new knowledge;
2. Applying knowledge:
   a. doing exercises with knowledge (focused on automating);
   b. applying knowledge in a context;
3. Developing non-discipline-related competences (skills and attitude).

This knowledge, skills and attitude can be learned through a variety of teaching methods. The table below gives an idealized picture of types of learning goals and the corresponding examination forms in the BSc programs. In many cases the acquisition of knowledge will precede the exercises and application of that knowledge.

<table>
<thead>
<tr>
<th>Type of learning goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of knowledge</td>
</tr>
<tr>
<td>Acquisition of and exercises with knowledge</td>
</tr>
<tr>
<td>Acquisition and application of knowledge, development of non-discipline-related competences</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of examinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written examinations</td>
</tr>
<tr>
<td>Written examinations and assignments</td>
</tr>
<tr>
<td>Assignments, thesis and portfolio</td>
</tr>
</tbody>
</table>

In the School of IE some experiments with digital testing are carried out, e.g. in the scoring and analyzing of Multiple Choice tests and by means of using clickers in in-between tests.

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2 In the Master’s phase students work towards Expert level.

3 See: ‘Visie TM op OGO’, October 2007 (note 245). This is under revision, probably Bloom’s taxonomy will be used to (re) formulate learning goals.
At the School of IE the cutting-score is determined conform the EER (article 4.7 EER BC, article 5.5 EER GS).

**Evaluating alignment**

Evaluation of the alignment of learning goals, educational forms and examination form is carried out on a ‘before and after’ basis. Before the course:

- The Curriculum Committee (Dutch abbreviation OC) discusses the match between the learning goals, educational forms and the examination method every time a course is developed or changed substantially;
- The Exam Committee (EC) annually examines the courses using the details provided in the Education and Examination Regulations (OER);
- The OC and EC advise the Director of Education on the educational program, the courses, and education and examination forms.

After the course, complaints from students received through the Exam Committee, Curriculum Committee or the educational management (written complaints or course evaluations) may be reasons to discuss the alignment of the learning goals and the examinations with lecturers.

**1.2 Vision on the examinations School of IE**

**Professional lecturers**

The School of IE respects and trusts in the professionalism of lecturers, and strives to create optimal conditions within which scientists can excel in their education and research. Professional lecturers have the responsibility to take initiatives and to develop working methods that contribute to the implementation of the examinations policy. This means that:

1. Lecturers are dedicated to transparent, valid and reliable construction, holding and assessing of examinations;
2. The Department provides teachers with sufficient time for developing, holding and assessing of examinations;
3. And gives teachers the opportunity to train themselves in testing and assessment.

TU/e requires that its teachers have a University Teaching Qualification (Dutch: Basis Kwalificatie Onderwijs). One of the competences in the UTQ is ‘Testing and Assessment’, which involves:

**The lecturer can:**

1. design a test plan, including assessment criteria and, using this, develop tests to check;
2. whether the students have met the learning objectives sufficiently well;
3. assess the learning process in groups of and individual students;
4. use student test results to assess whether learning objectives have been achieved;
5. analyze test results and draw conclusions on the quality of learning, teaching and testing.

In 2015 approximately 55% of the lecturers of the School of IE have obtained a UTQ certificate.

**Basics of the IE examination policy**

Lecturers make choices about the way in which they carry out examinations within the boundaries set by the educational policy and the guidelines of TU/e and the department. At TU/e we are aware of the influence of examinations on the study behavior of students, and we focus on the use of examinations as a ‘tool of learning’ and as a ‘tool for learning’.  

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'tool of learning'): the result of learning is to gather factual knowledge or skills, which may be correct or incorrect. Examinations as learning ('tool for learning'): examinations are a tool to facilitate learning and to support students in developing their own understanding of a subject.

Examinations influence the way in which students learn. The basic principles as stated below are followed in the School of IE:
- Examinations make it clear to students which knowledge is regarded as important;
- Examinations provide an understanding of the learning process; they give feedback on what students do and do not understand and/or what they can and cannot do, and on whether or not they have studied well and sufficiently. This means that examinations do not just mark the reaching of the final stage of education (summative examination), but can also provide feedback on how much progress a student has made in the learning process (formative examination). Feedback helps students to understand their own learning process, which will allow them to better direct their studying work;
- Online tools for feedback and examinations can be used. For example by means of ‘learning analytics’ it is possible to track students’ online study activities, and to respond specifically to them;
- Direct feedback may be given by a lecturer, but also by fellow students (‘peer review’).

The department IE&IS has a long tradition of quality improvement in relation to examinations. Already in 1999 the department started an ‘examinations’ project aimed at increasing the knowledge and skills of lecturers in designing and analyzing examination questions. However this has not yet resulted in a coherent examinations policy. A list of questions was drawn up in the department in 2010 in preparation for laying down the examinations policy of the department. The conclusion of the educational management was that a number of elements of the examinations policy had not yet been defined within the department. Based on this analysis the IE&IS educational management in consultation with the Exam Committees took the initiative to lay down an examinations policy for the department. The following steps were taken:
- Memorandum on examinations policy (2008);
- Proposal for the implementation of an OGO (Design-Based Learning) assessment system (2009);
- Quality assurance procedure for BSc and MSc theses for IE and IS (2010);
- Exam Bureau (2010);
- Assessment of the Quality Procedure (April 2012);
- Strengthening of the IE&IS Exam Committees (October 2012);
- Rules and guidelines for the TIW (Innovation Sciences) Exam Committee (December 2012).
These documents have been taken as the starting point for describing the examination policy of the School of IE.

1.3 Responsibilities of the Exam Committee and management

The Exam Committee is an independent body in the School of IE. Its most important task in relation to examination quality is the embedding of the quality system as described in Fig. 1 and proactive involvement in the processes and procedures as described above.

The ways in which the proactive role of the Exam Committee is put into effect in the School of IE include:
- Meetings twice a year between the chair of the Exam Committee and the Departmental Board;
- Meetings four times a year between the chair of the Exam Committee, the chair of the Curriculum Committee and the Director of Education;
- Monitoring of the examination process within the School, for example by monitoring the peer review procedure.
The Exam Committee has a legal right to investigate the quality of examinations, the results of examinations and the success percentages etc. by means of course evaluations, questionnaires, gathering complaints etc. A further description of the tasks and role of the Exam Committee can be found in the Examination Regulations of the School of IE (see: http://studiegids.tue.nl/bachelor-college/majors/technische-bedrijfskunde/reglementen/).

In addition, the Exam Committee appoints examiners, who in general are lecturers responsible for giving the education to which the examination relates (see appendix 1 for the profile of the examiners of the School of IE). The examiners will assess whether students have successfully completed the examinations or practical assignments. The corresponding certificate is issued on behalf of the Exam Committee. The Exam Committee itself has final responsibility.5

5 The IE Exam Committee has drawn up a profile of the examiners for the various educational programs on the basis of the ‘TU/e examiner profile’.
The Exam Committee must be fully familiar with the content of the educational programs and the regulations (TU/e and WHW [Higher Education and Scientific Research Act]), and must be easily accessible for all stakeholders (Curriculum Committee, students, lecturers, student counselors, Student Councils and Director of Education). The education management informs the Exam Committee about changes in the programs and courses.

The aim is for all the members of the Exam Committee to cover, both thematically and methodologically, the different aspects of the content of the educational programs. This means all members must stay sufficiently in touch with the organization of TU/e and the School to be able to deal with the matters that arise in the right context.

Composition of the Exam Committee (in accordance with the ‘Examination Committee Guide TU/e, 2014’):

1. The Departmental Board appoints the Exam Committee;
2. The Exam Committee has the following composition:
   a. a chair: a full professor;
   b. a vice-chair, to be appointed from among the members;
   c. three members;
   d. an official secretary.
3. The members and the chair must be staff members who make a substantial contribution to one or more of the educational programs provided by the department;
4. The appointment is for 2 years. Reappointment is possible;
5. The Exam Committee may consist of subcommittees, such as a committee for everyday tasks and a committee for quality assurance of MSc and BSc theses.

The IE&IS department has drawn up profiles of the chair, vice-chair, secretary, members and advisors (See Appendix 2). Besides the expertise of the EC members in the different disciplines of IE, the EC members possess also basic knowledge expertise in law (WHW), quality assurance and testing (UTQ). As of September 1th 2015 the appointment of an external member to the EC is compulsory.

The chair and secretary of the Exam Committee of the School of IE take part in university-wide consultative bodies: the Advisory Committee for Bachelor’s Examinations (AEB), the Advisory Committee for Master’s Examinations (AEM) and the secretaries of the Exam Committees discussion group. If necessary the committee can seek advice from the student counselor, (deputy) Director of Education or others.

The Exam Committee may follow a training course provided at TU/e level. In addition, TU/e has appointed an examinations expert to advise the Exam Committees.

The Exam Committee will account for (and reflect on) its activities during the year in an annual report. This report will be discussed by the chair of the Exam Committee with the Departmental Board (including the advisory members: the IE&IS Director of Education and the director of the IE Graduate School).
2. Quality assurance of examinations

The basic principle for quality assurance of examinations is that the quality system must focus on continuous improvement. Figure 1 shows the quality assurance cycle in relation to examinations in the IE&IS department.

![Quality assurance cycle](image)

Figure 2: Schematic representation of the examination quality assurance cycle

The examination quality assurance system consists of three elements: examination construction, holding of the examinations (test taking) and grading. Each examination must meet the criteria of transparency, validity and reliability.

- **Transparent**: it is clearly communicated to students before the examination how and on which aspects they are being examined;
- **Valid**: the examination covers the learning goals. Validity relates to the content (in line with the learning goals), level (difficulty) and representative quality;
- **Reliable**: the examination makes a significant distinction in the extent to which the students have achieved the learning goals. This also relates to the quality of the examination (distinguishing ability, minimal chance of random answers, unambiguous), the conditions under which the examination is held (standardization and objectivity) and the way in which the results are assessed (objective, non-random, precise).

Lecturers have primary responsibility for these three aspects. Quality control of these aspects is carried out in the first instance within the group in which the lecturer works. For each aspect, the School takes specific measures for the quality assurance of the examinations.

The Exam Committee has a specific role in the quality assurance of examinations because of its legal responsibility for the quality assurance of all examinations in Higher Education. It monitors the final level of the educational program and the quality of examinations within a program. The Exam Committee may investigate the processes and procedures used by the School to monitor and improve the quality of examinations. The Exam Committee is also authorized to appoint examiners.

2.1 Examination plan

Each year an examination plan for each study program is included as an appendix to the Education and Examination Regulations. This describes how courses are concluded. The examination plan deals with all examinations in a course (both summative and formative, final and interim, conditional and selective etc.). Box 1 shows an overview of the course details as described in the Educational and Examination Regulations:
- The semester in which a course is given;
- The course code and if applicable the course code(s) of the interim examination(s);
- The name of the course;
- The number of study points in EC;
- The examination forms: Written, Assignment, Report, Presentation, Oral, Notebook examination, practical exercise, test;
- The quartile in which the examinations are held.

At course level, a study guide describes how the examinations are held. Box 2 shows an overview of the aspects described in a study guide:

1. Structure of the examination
   - Form of interim and final examinations
2. Material covered by the examination
3. Dates of the examination and resit
4. Handing-in procedure
5. Dates of feedback and/or inspection
   - Scheduling of feedback times and way in which feedback is given (e.g. question hour, tutorial, meetings with supervisor etc.)
   - Scheduling and method of inspection (for written exams)
6. Determination of the final grade
   - Way in which the final grade is determined: e.g. weighting of sections, minimum requirements, peer review
   - Who determines the final grade
7. For assignments:
   - Assessment criteria
   - Peer assessment
8. Optional for multiple-choice examinations:
   - Dividing the examination questions over the material covered by the examination

It is therefore clear in advance what is being examined (linked to the learning goals of the course), how and when the examination will be held, if applicable what the consequences will be of passing or failing the examination, how different examinations count towards the final grade of the course, how the examination will be assessed (and by whom) etc. This description ensures transparency; it forces lecturers to think in advance about how they will structure the examinations or their course, and enables the Exam Committee to carry out its monitoring tasks better.

The number and nature of the (interim) examinations are described in the course descriptions (see http://onderwijs.tue.nl/Nieuws/Pages/Default.aspx). The course descriptions are submitted for review to the Curriculum Committee. A total overview of all examinations is given in the Education and Examination Regulations, on which the Curriculum Committee and the Examination Committee advise, which is approved by the Departmental Council, and which is confirmed by the Departmental Board. This gives the Exam Committee the opportunity to fulfill its monitoring role in relation to (interim) examinations in advance.

2.2 Procedures for composing, holding or assessing examinations
The examination procedures are described in the Examination Regulations of the courses. These can be found on the Education guide of the IE programs (https://studiegids.tue.nl/opleidingen/graduate-school/masters-programs/innovation-management/algemeen-ie/examencommissie-ie/). The Examination Regulations are drawn up by the Exam Committee and, as well as guidelines for the
Exam Committee, also include guidelines for composing, holding, assessing and analyzing examinations.

Other guidelines for examinations were drawn up on the introduction of the BSA (Binding Recommendation for Continuation of Studies) in 2010 and updated on the introduction of the Bachelor College in 2012. A list of the guidelines for written examinations is given below:

**Procedure for composing examinations**
In the School of IE, the procedure as described below is followed for composing written examinations:
1. The examination is composed in advance by the lecturer;
2. The learning goals of the course are used as the starting point for composing the examination. The lecturer must be able to show the relationship between the goals and the examination questions, for example as a result of complaints of students in course evaluations, or at the request of the Exam Committee. The Exam Committee recommends the use of an examination matrix;
3. The examination contains a list of the points that can be obtained per sub question and an answer model;
4. The examination has been reviewed, discussed and approved by at least two lecturers. The Exam Committee monitors the observation of this guideline;
5. Based on the check, the responsible lecturer adjusts the questions or the answer model;
6. When the course is running, the lecturers notify the students about the examinations. Students are given the opportunity to practice using similar assignments (e.g. with past examinations);
7. The finalized examination is handed-in to the secretariat of the Groups by the responsible lecturer not later than a week before the examination.

The examination schedule showing the dates and times of the examinations in the coming semester is announced by the Exam Committee at least a month before the start of the semester. Rescheduling an examination or changing its location is only allowed with the prior approval of the Exam Committee.

Examination questions must be valid. Table 1 shows the tools that can be used to assess the content validity of examination questions (Do the items of the scale cover the important characteristics of the concept being measured?). The table also shows the policy of the School in relation to these tools.

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6 See Examination Regulations 2016 Article 2.1.1
Table 1: Tools and policy for measuring the content validity of examination questions.

<table>
<thead>
<tr>
<th>Tool</th>
<th>By whom</th>
<th>Policy of IE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before:</strong> making an examination matrix. The matrix shows how many questions the examination contains for a specific subject and level (e.g. factual knowledge or application). This matrix reflects the learning outcomes of the course or part of a course to be examined.</td>
<td>Lecturer</td>
<td>This tool is being increasingly used, particularly by lecturers who have taken an course ‘written examinations’ as part of their BKO (Basic Teaching Qualification). This course is mandatory from 2013 for the BKO participants of the IE&amp;IS department.</td>
</tr>
<tr>
<td><strong>Before:</strong> peer review of examination content, form and answer model (if open questions are used). An example of a checklist for the assessment of open and closed questions.</td>
<td>Peer review</td>
<td>This tool is mandatory for all examinations in the School of IE.</td>
</tr>
<tr>
<td><strong>After:</strong> checking the difficulty of examination questions and the examination as a whole (p-value), attractiveness of the incorrect answers (a-value), the contribution of each question to the reliability (Rit, Rat, Rir and D-index).</td>
<td>Lecturer, may ask support from examination expert</td>
<td>Some lecturers carry out an analysis of this kind for multiple-choice examinations. For the use of this tool an appointment can be made with the examination expert at TU/e.</td>
</tr>
</tbody>
</table>

Procedures for holding examinations
The procedures for holding examinations in the School of IE are as follows:

Procedure for handing-in examination questions and answers
The questions for written examinations, including the cover page and the answer model, are handed-in before the start of the examination week to the secretariat of the Group. The answer model may be changed after the answers of students have been seen.

The IE&IS student administration provides a suitable examination room for the number of participating students and the nature of the examination. The student administration notifies the Group secretariat of the number of students who are registered for the examination and the room in which the examination will be held.

If the required information is provided in good time the Group secretariat ensures that there are enough examination papers in the examination room. The secretariat hands the examinations in to the examination coordinator, who ensures that the examinations are distributed to the invigilators. After the examination, the examination papers are collected by the invigilator and handed-in to the examination coordinator. The secretariats collect the examination papers, or otherwise these are delivered by courier to the secretariats.

In the Examination Regulations instructions are given for lecturers, invigilators and students, concerning e.g.:
- Presence of lecturer during the examination:
- Instruction of invigilators:
- Accessibility of the lecturer during resits:
- Collection of the completed examinations.

Transparency is an important principle in relation to the quality of examinations. For examinations, transparency relates to the procedures and processes. These must be clearly visible to the students, and students must be informed about them or must be able to find out about them. Table 2 gives a
list of the tools that can be used to measure the quality of how examinations are held, and the policy relating to these tools.
Table 2: Tools and policy relating to measurement of transparency of examinations.

<table>
<thead>
<tr>
<th>Tool</th>
<th>By whom</th>
<th>Policy of IE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before:</strong> Mandatory examination instructions.</td>
<td>Lecturer</td>
<td>Every written final examination has a cover page which states the examination instructions for students and invigilators.</td>
</tr>
<tr>
<td><strong>Before:</strong> Making it clear in the study guide how the grades are determined.</td>
<td>Lecturer</td>
<td>Mandatory (see section 1.2).</td>
</tr>
<tr>
<td><strong>Before:</strong> Providing practice examinations.</td>
<td>Lecturer</td>
<td>In the Bachelor College, lecturers do not teach in week 8 of each quartile, but instead give tutorials and practice examinations.</td>
</tr>
<tr>
<td><strong>After:</strong> Course evaluations, curriculum evaluations, Student Councils.</td>
<td>Quality assurance staff, study associations, individual students</td>
<td>Remarks about any unclear points are passed on to the educational management through the Student Councils. The Exam Committee receives complaints from students and deals with these itself or through the educational management.</td>
</tr>
<tr>
<td><strong>After:</strong> Reports from invigilators. After each examination period the educational management and the Exam Committee receive a report of any irregularities arising during examinations.</td>
<td>Real Estate Management</td>
<td>If necessary the lecturer or student concerned is contacted by the Exam Committee or educational management.</td>
</tr>
</tbody>
</table>

**Procedures for assessment of examinations**

The procedures for the assessment of examinations in the School of IE are as follows:

1. The examinations of a part of the examination candidates are checked using the answer model. After this first round, the answer model is adjusted if necessary;
2. If several lecturers are involved in the grading process, they will preferably each check their own questions instead of dividing the examinations among themselves;
3. The responsible lecturer will ensure that the procedures in relation to grading are observed;
4. In accordance with article 4.7, para. 8 of the Education and Examination Regulations, all examinations in the first year that receive a grade of 5 and affect the BSA (Binding Recommendation for Continuation of Studies) must be checked by a second examiner. The final result is confirmed in consultation between the first and second examiner. In the School of IE this rule also serves as a guideline for the other years.

**Procedure for handing-in of grades**

The result of all written examinations must be handed-in to the student administration not later than 15 working days after the examination, with the exception of the grading of the examinations of quartile 4 and the Interim period. These must be handed-in not later than 5 working days after the end of the examination period (and before 1 September). The latest date for handing-in the results is shown on the list of examination candidates (see also under point 3). This also applies to the results of assignments etc.

The results of interim examinations are determined within 5 working days, and in any case not later than 5 days before the final examination.

The course administration will send lists of examination candidates (hard-copy and digital) in the groups concerned to the lecturer. The results may be shown on these lists.
Procedure for automated processing of multiple-choice (MC) examinations

MC examinations may be processed by the Group secretariats by using software of the Department Mathematics and Computer Science. More information: Hans Cuypers (f.g.m.t.cuypers@TUE.nl).

The department has a procedure for examination assessments that are received too late:
- each examination has a cover page clearly showing the latest date for handing-in the results. In addition, a list is sent to the secretariat showing all information about the examinations, such as date, time and number of examination candidates, as well as the latest date for handing-in the results. In addition, the latest date for handing-in the results is preprinted on each page.
- One day after the announcement of the results (or on the following Monday if this date is a Friday), the lecturer or the course administration receive an e-mail asking when the results can be expected. The Exam Committee can give permission for a longer assessment period at the request of the lecturer.
- At the end of the examination period, the complete list is sent to the Exam Committee. This shows the Exam Committee the scale of the problem, and enables it to take the appropriate action using the authorizations which it holds.

In grading examinations the question of reliability is of primary importance. Reliability is linked to the extent to which the examination provides consistent results regardless of the goal. The measured correctness or the reliability of an examination can be regarded in two ways, according to the classical test theory:
1. the extent to which there is agreement between the assessors (= inter-assessor reliability);
2. the extent to which the scores are consistent after a repeated measurement by the same assessor (= test-retest reliability).

Table 3 shows the tools and the policy at the School of IE relating to the measurement of the reliability of examinations.

Table 3: Tools and policy relating to measurement of reliability of examinations.

<table>
<thead>
<tr>
<th>Tool</th>
<th>By whom</th>
<th>Policy of IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer model</td>
<td>Peers</td>
<td>For open questions an answer model must be present that has been approved in advance by peers and that is used to grade examinations.</td>
</tr>
<tr>
<td>Consultation between assessors</td>
<td>Lecturer and team</td>
<td>If there are multiple assessors there must be consultation on the assessment of the examinations. Questions should preferably be shared between the assessors, and not the complete examinations.</td>
</tr>
<tr>
<td>Analysis of examinations. With open questions using the coefficient alpha method (e.g. Cronbach’s alpha). Analysis of MC exams.</td>
<td>Lecturer, may ask support from examination expert</td>
<td>The examination expert at TU/e can be asked to analyze examinations, for example at the request of the Exam Committee.</td>
</tr>
</tbody>
</table>
2.3 Measurement of results: tools to measure the quality of examinations

The lecturer, together with his/her colleagues, is responsible for the quality of examinations. To measure the quality of examinations, course evaluations are used in the first instance. Article 2.1, para. 5 of the Examination Regulations states that the Exam Committee monitors the quality of examinations based on the information obtained from the students and through the educational quality assurance staff (who assess the quality of the educational units and discuss this with the lecturer). The information is obtained, among other sources, from the questionnaires used for the course evaluations.

Examples of questions about examinations in the course evaluations are:

- Are you satisfied with the way the assignments are given? (For example the level of the final assignment, the available time, the relationship between the final assignment and the interim examinations, the clarity and relevance of the assignment and the assessment criteria; did the final assignment live up to the expectations);
- Are you satisfied with the final examination?
- Are you satisfied with the multiple-choice examination?
- Are you satisfied with the interim examinations? (For example the feedback that you received and its motivational effect, and the preparations for the final examination).

If the results of the course evaluations indicate that an examination and/or the assessment procedure are not of the required quality, the Exam Committee will refer the responsible lecturer to the Quality Assurance & Educational Innovation Bureau. The Bureau will ensure that the lecturer carries out a further analysis of the quality of the examinations and draws up an improvement plan (see Examination Regulations article 2.1).

The lecturer has tools available to measure the quality of the three phases of the examination quality cycle (Figure 1, §1.3). The Exam Committee can also use these tools to investigate and assure the quality of examinations, both in advance and afterwards.

Other rules relating to the analysis and evaluation of examinations are:

1. Students can view their work after the assessment, so they can learn from it and can check the assessment. The responsible lecturer will make clear in advance (in the study guide) how, where and when students can review their examinations. After the examination has been assessed, students will receive an e-mail with the date on which the examinations are available for viewing;
2. All examinations, including questions and answer models, must be kept for at least 2 years by the secretariat of the Group, in accordance with article 5.11 of the Education and Examination Regulations 2016-2017 (BSc courses). BSc and MSc theses are kept for at least 7 years (in accordance with article 5.11 of the Education and Examination Regulations 2016-2017). The guidelines for the administrative processing and archiving are given in the Examination Regulations. Written examinations and assignments are kept for 2 years;
3. In accordance with the Education and Examination Regulations for the Bachelor College, the results of interim examinations are only valid in the academic year in which they are taken. The Exam Committee may decide that:
   - interim examinations remain valid for a longer period, for example in case of a test, an experiment, fieldwork or an excursion;
   - PRV examinations remain valid in case of training only.
2.4 Anti-fraud policy

As well as the quality assurance both in advance and afterwards of theses, the department has since 2006 followed an anti-fraud policy. This anti-plagiarism policy is aimed at making students (and lecturers) aware of the scientific standards relating to plagiarism and detecting it in scientific work and papers. As of 2015 the TU/e policy regarding anti-fraud will be implemented.

2.5 Communication

Students (and lecturers!) can find information on the education rules and regulations, as well as on the rules and regulations concerning examination on the digital education site: http://educationguide.tue.nl

Information on making complaints can be found on: http://w3.tue.nl/en/services/stu/complaints_and_disputes/appeals/

For lecturers the Education Support Office of STU can provide more information on examination, testing, fraud etcetera and the concerning TU/e policy. At Departmental level the ‘portefeuillehouder onderwijs’ of each Group and the (deputy) Director of Education provides information about examination to (new) lecturers. The Student Administration informs lecturers about operational issues regarding examinations.
3. Assurance of the final level of students

Article 7 of the Higher Education and Scientific Research Act (WHW) lays down regulations for registration in higher education. Under the regulations of the Inspectorate of Education, the most important requirements for student examinations and assessments, and the prerequisites for assurance of the final level, are given below:

- The Education and Examination Regulations. These describe the content and the rules for assessments and examinations for each course or group of courses, and form the basic document for students, lecturers, Exam Committees, examiners and managers, and lay down the applicable procedures and the rights and duties of both the students and the educational institute, as laid down in article 7.13 of the Higher Education and Scientific Research Act (WHW);
- The Exam Committee. The Exam Committee maintains the level of education by internal monitoring of assessments and examinations in terms of content, method and level. The Exam Committee has the task of ensuring that graduates have achieved the final qualifications as described in the Education and Examination Regulations (articles 7.12, 7.12a and 7.12b);
- The examiners. Examiners assess students, and by doing so make an important contribution to assuring and promoting the level of students (article 7.12c);
- Observation of internal regulations and procedures.

The way in which the School of IE monitors and assures the final level of students is described below.

3.1 Level of BSc and MSc theses

A number of tools are used to maintain the quality of BSc and MSc theses at a high level:

1. A thesis manual which is updated annually by the deputy Director of Education and is posted on the digital TU/e education guide (http://educationguide.tue.nl). This manual describes the steps to be taken in the BSc and MSc graduation process and the regulations relating to supervision, assessment etc.;
2. Graduation of BSc and MSc students is part of the BSc and MSc curriculum evaluation. This evaluation enables students to express their views on different aspects of BSc and MSc graduation, their supervision and the assessment of their theses.
3. The BSc Thesis Assessment Committee consists of two members (a supervisor and an assessor). The members of the committee are selected conform the criteria with regard to the authorizations to evaluate examinations, as determined by the Exam Committee.
4. The second member of the BSc Assessment Committee acts as an assessor. The assessor is from another research chair. The role of the assessor is to guarantee the end terms of the Bachelor End Project. The project of the student has to fit within these terms. This is only possible when the second assessor is involved in judging the research proposal. So the second assessor has a role as well in the beginning as in the end of the project. The second assessor does not have to be present at the final presentation. Both mentor and assessor provide a grade on the written thesis in writing, after which the grade for the written thesis is determined after discussion. The final grade for the BSc project is determined by the mentor.

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5. The use of assessment forms for BSc and MSc theses is mandatory in the School of IE. The Exam Committee plays an important role in the drawing up and regular updating of these assessment criteria.

6. The MSc Thesis Assessment Committee consists of three members (a mentor, a second supervisor and an assessor). The members of the committee are selected conform the criteria with regard to the authorizations to evaluate examinations, as determined by the Exam Committee.

7. The second member of the MSc Thesis Assessment Committee is a second supervisor who can be from any research chair.

8. A student writes a research proposal for the MSc thesis, and this is then assessed by the mentor and second supervisor.

9. The third member of the MSc Thesis Assessment Committee acts as an assessor. The third assessor represents here a more multidisciplinary perspective than the first and second supervisor and is qualified to judge the engineering aspects of the thesis. The role and expected input of the third assessor consists of reading the final report, attending the thesis defense session and participating in the final deliberations regarding the grade.

10. The course administration carries out the archiving of BSc and MSc theses, including the assessment forms. If the forms are not correctly filled-in, the assessors are asked to complete this process.

3.2 Quality assurance of BSc and MSc theses

Regulations for quality assurance of BSc and MSc theses were drawn up and approved by Exam Committee and the Departmental Board at the end of 2007.

The regulations (see Appendix 3 and 4) have been updated over time, and include provisions on:
- Assessment of research proposals by the mentor (first assessor) and the second supervisor (second assessor);
- Appointment of an Assessment Committee by the Exam Committee;
- Assessment forms: checking that these are correctly filled-in is carried out by the student administration, incompletely filled-in forms are sent back to the assessors;
- Assessment of the quality of the theses by (a committee of) the Exam Committee: the Exam Committee takes steps if the assessment by the committee differs from that of the assessors.

3.3 Involvement of stakeholders

The department has set up an Advisory Board to advise on matters relating to education. This board consists partly of alumni of the educational programs. It plays an active role in considering the level and the content of the educational programs. It also maintains regular contact with alumni and alumni associations from the School, in which the alignment of the educational programs with the employment market is an important topic of discussion.
APPENDIX 1: profile of the examiners of the School of IE
(only in Dutch)

Examenbevoegdheid in de School of Industrial Engineering
Examencommissie Industrial Engineering

Het doel van dit document is het vaststellen van de regels die de examenbevoegdheid bepalen van de docenten in de bachelor opleiding Technische Bedrijfskunde en de Masteropleidingen Operations Management and Logistics (OML) en Innovation Management (IM). Dit is belangrijk om de kwaliteit in deze opleidingen te borgen.

Een examiner is een functionaris, in dienst van de TU/e dan wel ingehuurd, die verantwoordelijk is voor een vak en door de examencommissie is aangewezen voor het beoordelen van studenten door middel van het afnemen van tentamens over het vak en het vaststellen van de uitslag daarvan (Bron: Profielschets Examinatoren).

De examenbevoegdheid ligt enkel bij de docenten die ook examiner zijn. Een vakverantwoordelijke docent dient altijd een examenbevoegd docent te zijn, vermits hij verantwoordelijk is voor het afleveren van het (eind)cijfer. In het geval een 2e examiner wordt aangeduid, denk hierbij aan de Master Thesis of aan mogelijke re-assesments in het Bachelor programma, gebeurt dit ook door een examenbevoegde docent.

Voor de duidelijkheid is het vervolg van dit document opgesplitst in 2 delen: bachelor versus masteropleidingen. De faculteit verplicht een BKO traject voor elke (nieuwe) medewerker.

Examenbevoegdheid in de Bacheloropleiding Technische Bedrijfskunde
In de Bacheloropleiding zijn de volgende personen altijd examiner: PostDocs, (Universitair) Docenten, Universitair Hoofddocenten en Hoogleraren. Personen uit de ondersteunende diensten, PhD studenten en Industrial Fellows zijn nooit examiner, maar kunnen eventueel optreden als procesbegeleider (denk aan het BachelorEindProject), onder verantwoordelijkheid van een examiner.

Examenbevoegdheid in de Masteropleidingen OML en IM
Vanwege de duidelijke koppeling aan onderzoeksactiviteit in de eindtermen van de opleidingen, is de regel voor de Masteropleiding striker. Deze regel is gebaseerd op het, voor de Examencommissie IE, geformuleerde advies door de Graduate Program IE Directeur (onder andere in het IE overleg vastgesteld op 26 maart 2012).

De algemene regel is dat een examiner (wat zowel vakverantwoordelijkheid en/of afstudeerbegeleiding inhoudt) moet voldoen aan één van de volgende twee criteria:
- Hij/zij is lid van deKNAW-erkende onderzoekschool Beta;
- Hij/zij heeft over de afgelopen periode van drie jaar tenminste twee artikelen gepubliceerd in tijdschriften en/of proceedings die vermeld zijn op de ISI lijst. PostDocs die voldoen aan deze criteria zijn in principe ook examiner. Personen uit de ondersteunende diensten, PhD studenten en Industrial Fellows zijn nooit examiner, maar kunnen eventueel wel optreden als procesbegeleider, onder verantwoordelijkheid van een examiner.
**Uitvoering**
Door het Graduate Program IE zal jaarlijks een lijst worden opgesteld van de personen die voldoen aan de criteria. Dit gebeurt in april, in aansluiting op de beoordelingsronde van de onderzoekschool Beta. Op basis van deze lijst, stelt de Examencommissie IE de examinatoren vast en communiceert dit richting de opleidingsdirectie, de verschillende capaciteitsgroepen en het Faculteitsbestuur. Zowel Voor Bachelor als Master geldt dat als een capaciteitsgroep een niet-examenbevoegde toch als examinator wil laten optreden, de capaciteitsgroepsvoorzitter een met redenen omkleed verzoek (bv. Wegens overmacht, zoals langdurige ziekte, zwangerschap, etc.) dient voor te leggen aan de examencommissie. De examencommissie besluit of er al dan niet ontheffing wordt verleend.

**Overgangsregelingen**
Vermits bovenstaande regelingen reeds in voege zijn voor het bepalen van de examenbevoegde afstudeerbegeleiders is hier geen overgangsregeling nodig.

Voor de vakverantwoordelijke docenten in de Masterprogramma’s, kan dit anders zijn. Het uitgangspunt is dat zo veel mogelijk aanpassingen gebeuren om vanaf Academiejaar 2014-2015 voor alle vakken reeds in regel te zijn. Indien dit niet lukt, kan er dispensatie gevraagd worden. Als van deze dispensatie gebruikt gemaakt wordt, kan de capaciteitsgroepsvoorzitter een met redenen omkleed verzoek voor leggen aan de examencommissie.

Vanaf Academiejaar 2015-2016 loopt deze dispensatiemogelijkheid af en valt vakverantwoordelijkheid en examenbevoegdheid in principe volledig samen in de functie van examinator.
Appendix 2: Profile of chair, vice-chair and members of the Exam Committee (May 2013)

Chair
- Final responsibility for carrying out the tasks of the Exam Committee and the policies as defined by the committee as a whole
- Representing the Exam Committee (mandate to the chair if decisions need to be taken rapidly with accountability)
- Chairing meetings
- Signing diplomas
- Specific activities/action points of the Exam Committee
- Final responsibility for annual reports and the annual plan of the Exam Committee
- Deciding vote on resolutions if there is no majority
- Member of the Central Exam Committee Bachelor College
- Personal characteristics:
  - Acts effectively
  - Able to take decisions
  - Tactical
  - Takes the initiative
  - Good communication and social skills

Vice-chair
- Supports and when necessary deputizes for the chair
- Together with the secretary ensures that specific educational data is available when needed
- Deals with individual requests and elective packages
- Personal characteristics:
  - Tactical
  - Structured
  - Persuasive
  - Good communication and social skills

Full Exam Committee
- Participation in hearings (fraud, appeal): the chair and at least 1 member of the Exam Committee must participate. In case of appeals to the Executive Board: hearings with the student and lecturer to investigate possible friendly settlements and, if no agreement is reached, the subsequent hearing before the Executive Board.
- Determining the guidance in case of requests (policy-making)
- Jointly defining the quality system in relation to examination content and organization
- Promoting his/her own expertise in relation to membership of the Exam Committee
- Personal characteristics:
  - Examination expert; at least one member of the Exam Committee
  - Educational expert
  - Sensitive to the working environment
  - Knowledge of relevant legislation and regulations
  - Advisory skills

Secretary
- Scheduling consultation meetings and hearings; coordinating the agenda with the chair
- Making available information so that the Exam Committee can take soundly based decisions
- Making available data for the annual report
- Writing minutes of the meetings
- Attending consultation meetings with the secretary of the Central Exam Committee
- Dealing with decisions of the Exam Committee
- Handling correspondence
- Providing administrative support and advice; not authorized to take decisions
- All ‘standard’ tasks of the Exam Committee may be delegated to the course administration (study packages, dispensations, examination results etc.), and therefore do not need to be dealt with specifically by the secretary; there must be a structured method within the Exam Committee for making available data which the Exam Committee needs as standard (what/when) from the course administration. This will allow a standard set of data to be built up

- Personal characteristics:
  - Structured
  - Accurate
  - Knowledge of relevant legislation and regulations
  - Concise
  - Consistent
  - Careful and thorough

**Advisory members**
- Study advisors:
  - Structural advisory tasks (not relating to decisions or policy-making) on individual requests

- Examination expert:
  - Not present in the department
Appendix 3: Quality assurance of BSc theses

Regulations for quality assurance of BSc theses

1. A research proposal for a BSc thesis must have a predefined format. Each proposal is assessed by a staff member who is authorized to take examinations.
2. The Exam Committee appoints a second assessor for all Final BSc projects.
3. Both the first and second assessors are authorized to take examinations.
4. The tasks and responsibilities in the BSc Thesis Assessment Committee are:
   a. The first member of the BSc Thesis Assessment Committee is the supervising mentor who is denominated as the first assessor;
   b. The BSc mentor can be a PhD candidate, under the condition that he/she has sufficient seniority by having successfully followed the TEACH course ‘supervising BSc students’ and is coached by a qualified faculty member. In case the BSc mentor is a PhD candidate, the assessment form can only be signed by the qualified faculty member. He/she has to be present at the final presentation.
   c. The second member of the BSc Assessment Committee acts as an assessor. The assessor is from another research chair. The role of the assessor is to guarantee the end terms of the Bachelor End Project. The project of the student has to fit within these terms. This is only possible when the assessor is involved in judging the research proposal. So the assessor has a role as well in the beginning as in the end of the project.
   d. The role and expected input of the second BSc thesis assessor is that he/she receives the report and determines what grade he/she would give for the thesis (not the professional skills). He/she does not have to be present at the final presentation. Both mentor and assessor provide a grade on the written thesis in writing, after which the grade for the written thesis is determined after discussion. The final grade for the BSc project is determined by the mentor.
5. The Exam Committee may take further action if it considers it necessary to do so on the basis of the assessments of the first and second assessors.
6. The assessment of the BSc thesis is carried out on the basis of a completely filled-in assessment form. The first assessor hands-in this filled-in form to the course administration.
7. The grades for the BSc thesis are not official until the assessment form has been received by the course administration. The course administration keeps a list of the BSc theses that have been handed-in and the corresponding assessment forms.
8. BSc theses are in principle confidential, and are collected and kept by the course administration.
Appendix 4: Quality assurance of MSc theses

School of IE: Regulations for quality assurance of MSc theses in Operations Management & Logistics (OML) and Innovation Management (IM)

1. Research proposals are written by students and assessed by the mentor (first assessor) and the second supervisor (second assessor). If they commit themselves to a project, both sign a start form.
2. For all graduation projects the Exam Committee appoints an Assessment Committee.
3. The first as well as second and third assessors are authorized to take examinations, and are preferably members of a research school.
4. The tasks and responsibilities in the MSc Thesis Assessment Committee are:
   a. The first member of the MSc Thesis Assessment Committee is the supervising mentor who is qualified by the Exam Committee and acts as the first assessor;
   b. The second member of the MSc Thesis Assessment Committee is a second supervisor who can be from any research chair;
   c. The second supervisor can be a PhD candidate, under the condition that he/she has sufficient seniority by having successfully followed the TEACH course ‘supervising MSc students’, and is coached by a qualified faculty member other that the first mentor. In case the second supervisor is a PhD student, the assessment form can only be signed by the qualified faculty member. He/she has to be present at the final presentation;
   d. The third member of the MSc Thesis Assessment Committee acts as an assessor. The assessor represents here a more multidisciplinary perspective than the first and second supervisor and is qualified to judge the engineering aspects of the thesis*
   e. Each member of the assessment committee provides a grade for the written thesis in writing. The assessor determines what grade he/she would give for the thesis (not the process and other skills)
   f. The role and expected input of the third MSc thesis assessor consists of reading the final report, attending the thesis defense session, and participating in the final deliberations regarding the grade.

*The third assessor ensures that the quality of the grading progress is safeguarded and in particular ensures that the assessment is based on expertise from multiple different disciplines relevant for every engineer (MSc) graduating at the School IE. This implies that the additional assessor is a faculty member with professional expertise beyond her or his disciplinary focus. The Exam Committee together with the Program Chairs will select the faculty members that qualify for this role based on the criteria:

- **Seniority**: more than 15 years experience and guidance over multiple master theses. Is able to guide students and is capable to see what the industry wants of a Master of Science graduate.
- **Multidisciplinary**: experience with projects outside his/her own discipline/CAP group and experience with other kind of research methodologies.
- **Experience in administrave work**: (has been) a member or the Educational Board, Examination committee or other educational related commissions. Is familiar with both the BSc and the MSc educational programs and its end terms.
5. The Exam Committee may take further action if it considers it necessary to do so on the basis of the assessments of the Assessment Committee.

6. The assessment of the thesis is carried out on the basis of a completely filled-in assessment form. The first assessor hands-in this filled-in form to the education administration.

7. The grades for the thesis are not official until the assessment form has been received by the education administration. The education administration keeps a list of the MSc theses that have been handed-in and the corresponding assessment forms.

8. MSc theses are public and are kept in the library. For this reason an MSc thesis must be a complete and legible report. The MSc thesis assessment form includes a part in which the first assessor has to give agreement for the copies which are provided to the library.