Examination Policy

School of Innovation Sciences

05-10-2016
TU/e
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Introduction

The School of Innovation Sciences of the TU/e Department IE&IS comprises four educational programs. The table below gives a list of the School’s educational programs and the responsible Examination Committees.

<table>
<thead>
<tr>
<th>CROHO educational programs</th>
<th>Bachelor College</th>
<th>Graduate Program</th>
<th>Examinations Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc Innovation Sciences (IS)</td>
<td>Major Sustainable Innovation (SI)</td>
<td></td>
<td>EC IS</td>
</tr>
<tr>
<td></td>
<td>Major Psychology &amp; Technology (PT)</td>
<td></td>
<td>EC IS</td>
</tr>
<tr>
<td>MSc Human Technology Interaction (HTI)</td>
<td></td>
<td>Graduate Program Innovation Sciences (IS)</td>
<td>EC IS</td>
</tr>
<tr>
<td>MSc Innovation Sciences (IS)</td>
<td></td>
<td></td>
<td>EC IS</td>
</tr>
</tbody>
</table>

This policy paper has been drawn up based on the examinations policy format as indicated in the TU/e Examination Policy. In this examination policy the IE&IS department 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 IE&IS Department 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 Examination Committee. This examination policy document has been drawn up by the IE&IS educational management and submitted for review to the IS Curriculum Committee. It has been confirmed by the Examination Committee and Departmental Board of IE&IS.

1.1 Educational vision of the IE&IS department

Learning outcomes

Learning outcomes (or exit qualifications) play a central role in the design of the educational programs of the School of IS. 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 placed 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 final achievement levels. Discussions with members of different organizations and institutions, alumni and (international) researchers have led to a 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 IS programs are assessed against the 3TU Criteria for Academic Bachelor’s and Master’s Curricula, as shown in the tables below.

Table 1: ACQA competence areas and learning outcomes of the BSc IS, major PT and SI

<table>
<thead>
<tr>
<th>ACQA Competence area</th>
<th>BSc IS major PT</th>
<th>BSc IS major SI</th>
</tr>
</thead>
<tbody>
<tr>
<td>scientific disciplines</td>
<td>1. Knowledge of and insight into specific technological systems and their components in one of the following technology domains: Information and Communication Technologies, Robotics, and Built Environment. 2. Knowledge of the core concepts, theoretical frameworks and methodologies of psychology and insights into their application to</td>
<td>1. Knowledge of and insight into specific technological systems and their components in one of the following technology domains: Sustainable Energy and Sustainability for the built environment. 2. Knowledge of and insight into the core concepts, theoretical frameworks and methodologies of innovation science for</td>
</tr>
</tbody>
</table>

| understand the relationships between technology and users. |
|---|---|
| 3. Knowledge of and basic skill in the techniques of observation, data collection and analysis techniques commonly used in the human-technology domain, and an awareness of the scope and limitations of these methods. |
| 4. Knowledge of and skills in the basics of the engineering profession such as mathematics, statistics and programming. |
| sustainability, thereby building upon disciplines such as economics and sociology. |
| 3. Multidisciplinary knowledge integrating innovation sciences knowledge with technological knowledge to address sustainability challenges. |
| 4. Knowledge of and basic skills in the relevant techniques of observation, data collection and analysis for sustainable innovation. |
| 5. Knowledge of and skills in the basics of the engineering profession such as mathematics, statistics and programming. |

| **doing research** |
|---|---|
| 1. Ability to reformulate an ill-structured research problem in terms of the core concepts and theories of psychology; in particular those pertaining to human-technology interactions. |
| 2. Ability to develop and execute a research plan (with supervision). |
| 3. Ability (with supervision) to contribute to the development of scientific knowledge in the area of the psychology of human-technology interactions. |
| 4. Ability (with supervision) to recognize and analyze problems typical for human-technology interaction from a technological and psychological perspective. |
| 5. Ability to appraise (under supervision) relevant scientific evidence on its usefulness in addressing a given research problem. |
| 6. Understanding of the ethics of psychological / user research, and has both the ability and attitude to adhere to these rules. |
| 1. Ability to formulate a sustainability research problem in terms of the core concepts and theories of innovation sciences. |
| 2. Ability to develop a research plan (with supervision). |
| 3. Ability (with supervision) to contribute to the development of scientific knowledge in one of the areas of the innovation sciences for sustainability. |
| 4. Ability (with supervision) to identifying and analyzing problems typical for the innovation sciences, by integrating technological and social sciences perspectives. |
| 5. Ability to appraise (under supervision) relevant scientific evidence on its usefulness in addressing a given research problem. |

<p>| <strong>designing</strong> |
|---|---|
| 1. Ability to reformulate an ill-structured design problem in terms of the core concepts and theories of psychology; in particular those pertaining to human-technology interactions. |
| 1. Ability to translate the outcomes of sustainable innovation research into design, policy or strategy recommendations for innovation in existing and new |</p>
<table>
<thead>
<tr>
<th>scientific approach</th>
<th>basic intellectual skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ability to document the result of psychological or user requirement research for future use within the organization.</td>
<td>1. A reflective attitude, with an ability to critically reflect (with supervision) on own thinking, decision making, and professional behavior.</td>
</tr>
<tr>
<td>2. Ability to use a systematic approach characterized by the consistent application of existing theories, concepts and models of psychology and technology.</td>
<td>2. A critical mindset and the ability to ask constructive questions regarding the basic problems in the field.</td>
</tr>
<tr>
<td>3. Ability to look beyond the borders of a specific discipline, to be sensitive to the relative contributions of various disciplines.</td>
<td>3. Ability to read and write scientific texts.</td>
</tr>
<tr>
<td>4. Basic understanding of the practices and principles of science.</td>
<td>4. Ability to think in abstract terms, including the ability to use and modify formal models of basic phenomena and processes in the field.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>socio-technical systems (under supervision).</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Ability to identify both the social and the technical implications of innovation sciences in the design recommendations for sustainability problems</td>
<td>1. A reflective attitude, with an ability to critically reflect (with supervision) on own thinking, decision making, and professional behavior.</td>
</tr>
<tr>
<td></td>
<td>2. A critical mindset and the ability to ask constructive questions regarding the basic problems in the field.</td>
</tr>
<tr>
<td></td>
<td>3. Ability to read and write scientific texts.</td>
</tr>
<tr>
<td></td>
<td>4. Ability to think in abstract terms, including the ability to use and modify (formal) models of basic phenomena and processes in the field.</td>
</tr>
</tbody>
</table>
phenomena and processes in the domain.

c**o-operating** and communicating

1. Capability of reporting and communicating the results of one’s learning and decision making – including one’s research outcomes --, both verbally and in writing, with academic peers, engineers in one’s domain, and users.
2. Awareness of differences in work practices between scientific disciplines
3. Ability to contribute to multi- or interdisciplinary teams of engineers and academic peers.
4. Ability to listen, read, talk and write in English.

1. Capability of reporting and communicating the results of one’s learning and decision making – including one’s research outcomes --, both verbally and in writing, with academic peers and engineers in one’s domain.
2. Ability to work in (multidisciplinary) teams.
3. Ability to listen, read, talk and write in English.

**temporal and social context**

1. Ability to reflect on the relation between the use of scientific knowledge and technology, the implicated social, normative and ethical issues, and the way in which knowledge and technology development is influenced by its social and historical context.
2. Understanding of the different roles of engineers and related professionals in society.

1. Ability to reflect on the relation between the use of scientific knowledge and technology, the implicated social, normative and ethical issues, and the way in which knowledge and technology development is influenced by its social and historical context.
2. Understanding of the different roles of engineers and related professionals in society, in particular in relation to sustainability challenges.

<table>
<thead>
<tr>
<th>ACQA Competence area</th>
<th>MSc HTI</th>
<th>MSc IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>scientific disciplines</td>
<td>1. Knowledge of and insight into technological systems and their components in a specialized area of their background engineering domain. 2. Thorough knowledge and understanding of concepts, theoretical frameworks and methodologies of the psychology and human-technology interaction domains. 3. Thorough knowledge of and insight into technological systems and their components in a specific technology domain. 2. Thorough understanding of concepts, theoretical frameworks and methodologies of innovation sciences extending to the forefront of knowledge 3. Thorough multidisciplinary knowledge integrating innovation sciences knowledge with</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Advanced skills</th>
<th>doing research</th>
<th>designing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>advanced skills in the techniques of observation, data collection and analysis techniques in the human-technology domain, and an ability to critically reflect on the scope and limitations of these methods.</strong></td>
<td><strong>1. Ability to formulate research problems in terms of concepts and theories of psychology and human-technology interactions</strong></td>
<td><strong>1. Ability to formulate design problems in terms of concepts and theories of psychology and human-technology interaction.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>2. Ability to independently develop and execute a research plan.</strong></td>
<td><strong>2. Ability to develop and execute a sound plan for formulating design requirements.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>3. Ability to contribute independently to the development of scientific knowledge in the area of the human-technology interactions.</strong></td>
<td><strong>3. Ability to integrate existing knowledge, or identify gaps therein, on technological requirements for human-technology interactions in the (re-)design of (requirements for) products or systems.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>4. Ability to identify and analyze problems typical for human-technology interaction by integrating technological and psychological perspectives.</strong></td>
<td><strong>4. Ability to integrate the technological and psychological</strong></td>
</tr>
<tr>
<td></td>
<td><strong>5. Ability to appraise relevant scientific evidence on its usefulness in addressing research problems.</strong></td>
<td><strong>1. Ability to independently translate the outcomes of innovation sciences research into design, policy or strategy recommendations for innovation in existing and new socio-technical systems.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>6. Understanding of the ethics of psychological / user research, and has both the ability and attitude to adhere to these rules.</strong></td>
<td><strong>2. Ability to independently identify both the social and the technical implications of innovation sciences in design recommendations.</strong></td>
</tr>
<tr>
<td><strong>technological knowledge in relevant domains, and the ability to critically reflect on the scope and limitations of this knowledge.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. Thorough knowledge of and advanced skills in the techniques of observation, data collection and analysis techniques in the innovation sciences domain, and an ability to critically reflect of the scope and limitations of these methods.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
domains, merging knowledge, methods and concepts.

5. Ability to make decisions with respect to design requirements where they pertain to the interaction between the user and the system or product, and to justify these decisions in a systematic manner.

| scientific approach | 1. Ability to document the result of psychological or user requirement research for the development of knowledge within the field and beyond.  
2. Ability to apply meticulously, and examine critically existing theories, concepts and models in the human-technology interaction domain.  
3. Ability to look beyond the borders of a specific discipline, to be sensitive to the relative contributions of various disciplines and to understand the knowledge demands of a specific discipline.  
4. Understanding of the practices and principles of science, and knowledge of current debates about this. |
| --- | --- |
| 1. Ability to apply and critically examine existing theories, concepts and models in the innovation sciences domain.  
2. Ability to look beyond the borders of a specific discipline, to be sensitive to the relative contributions of various disciplines and to understand the knowledge demands of a specific discipline.  
3. Ability to use a systematic approach characterized by the consistent application of existing theories, concepts and models in innovation sciences, and knowledge of current debates about this. |

| basic intellectual skills | 1. A reflective attitude, with an ability to critically and independently reflect on own thinking, decision making, and professional behavior.  
2. A critical mindset and the ability to ask constructive questions regarding complex problems in the field.  
3. Ability to take a standpoint with regard to scientific arguments in the field, and to critically assess its value.  
4. Ability to think in abstract terms, including the ability to develop formal models of phenomena and processes in the domain. |
| --- | --- |
| 1. A reflective attitude, with an ability to critically and independently reflect on own thinking, decision making, and professional behavior.  
2. A critical mindset and the ability to ask constructive questions regarding complex problems in the field.  
3. Ability to read and write scientific texts.  
4. Ability to think in abstract terms, including the ability to develop (formal) models of phenomena and processes in the domain. |

<table>
<thead>
<tr>
<th>co-operating and communicating</th>
<th>1. Capability of reporting and communicating the results of one’s learning and decision making – including one’s research outcomes --, both verbally and in writing, with academics and engineers in various</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Capability of reporting and communicating the results of one’s learning and decision making – including one’s research outcomes --, both verbally and in writing, with academics and engineers in various</td>
<td></td>
</tr>
</tbody>
</table>
various domain, users, and the general public
2. Ability to recognize and deal with differences in work practices between scientific disciplines and academics from other cultural backgrounds.
3. Ability to take a leading role in multi- or interdisciplinary teams of engineers and academics.
4. Ability to listen, read, talk and write in English on a professional level

| Ability to reflect on the relation between the use of scientific knowledge and technology, the implicated social, normative and ethical issues, and the way in which knowledge and technology development is influenced by its social and historical context, and the ability to integrate such relations and implications in their professional work. |
| Understanding of the different roles of engineers and related professionals in society, and the ability to determine one’s own place as a professional in society. |

**temporal and social context**

1. Ability to reflect on the relation between the use of scientific knowledge and technology, the implicated social, normative and ethical issues, and the way in which knowledge and technology development is influenced by its social and historical context, and the ability to integrate such relations and implications in their professional work.
2. Understanding of the different roles of engineers and related professionals in society, and the ability to determine one’s own place as a professional in society.

**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 the 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 no disturbing 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>
<th>Type of examinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition of knowledge</td>
<td>Written examinations</td>
</tr>
<tr>
<td>Acquisition of and exercises with knowledge</td>
<td>Written examinations and assignments</td>
</tr>
<tr>
<td>Acquisition and application of knowledge, design, research, development of non-discipline-related competences</td>
<td>Assignments, thesis and portfolio</td>
</tr>
</tbody>
</table>

4 In the Master’s phase students work towards Expert level.
In the School of IS 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.

At the School of IS 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 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 Examinations 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 IS**

**Professional lecturers**

The School of IS 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:

- Lecturers are dedicated to transparent, valid and reliable construction, holding and assessing examinations;
- The Department provides teachers with sufficient time for developing, holding and assessing examinations;
- 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:

<table>
<thead>
<tr>
<th>The lecturer can:</th>
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<tbody>
<tr>
<td>1. design a test plan, including assessment criteria and, using this, develop tests to check;</td>
</tr>
<tr>
<td>2. whether the students have met the learning objectives sufficiently well;</td>
</tr>
<tr>
<td>3. assess the learning process in groups of and individual students;</td>
</tr>
<tr>
<td>4. use student test results to assess whether learning objectives have been achieved;</td>
</tr>
<tr>
<td>5. analyze test results and draw conclusions on the quality of learning, teaching and testing.</td>
</tr>
</tbody>
</table>

In 2014 approximately 45% of the lecturers of the School of IS have obtained a UTQ certificate. The School has set the target figure of 50% in 2016.

**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’. Examinations as test of knowledge (‘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 IE&IS department:

- 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 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 both Examinations 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);
- Examinations Bureau (2010);
- Assessment of the Quality Procedure (April 2012);
- Strengthening of the IE&IS Examinations Committees (October 2012);
- Rules and guidelines for the TIW (Innovation Sciences) Examinations Committee (December 2012).

These documents have been takes as the basic principles in describing the examinations policy of the IE&IS department.

1.3 Responsibilities of the Examinations Committee and deans

The Examinations Committee is an independent body in the IE&IS department. 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.

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The ways in which the proactive role of the Examinations Committee is put into effect in the IE&IS department include:
- Meetings twice a year between the chair of the Examinations Committee and the Departmental Board;
- Meetings four times a year between the chair of the Examinations Committee, the Curriculum Committee and the Director of Education;
- Monitoring of the examination process within the department, for example by monitoring the peer review procedure.

Figure 1. Division of responsibilities between Exam Committee and management (see: Van Zijl & Jaspers (2012), Joosten-ten Brinke & Van der Linen-Straatman (2012)).

The Examinations 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. The Examinations Committee periodically investigates the quality of examinations by random sampling. A further description of the tasks and role of the Examinations Committee can be found in the Examination Regulations of the School of IS (see: http://studiegids.tue.nl/bachelor-college/majors/sustainable-innovation/reglementen/).
In addition, the Examinations 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 IS). The examiners will assess whether students have successfully completed the examinations or practical assignments. The corresponding certificate is issued on behalf of the Examinations Committee. The Examinations Committee itself has final responsibility.\(^7\)

The Examinations Committee must be fully familiar with the content of the educational program and the regulations (TU/e and WHW [Higher Education and Scientific Research Act]), and must be easily accessible for all stakeholders (educational management, students, lecturers, student counselor, Student Councils and Director of Education). The aim is for all the members of the Examinations 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 to be able to deal with the matters that arise in the right context.

Composition of the Examinations Committee:

1. The Departmental Board appoints the Examinations Committee;
2. The Examinations Committee has the following composition:
   a. a chair;
   b. a vice-chair, to be appointed from among the members;
   c. two members;
   d. an external member;
   e. 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 Examinations 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 IS, 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 Examination Committee of the School of IS take part in university-wide consultative bodies: the Advisory Committee for Bachelor’s Examinations (AEB) and the Advisory Committee for Master’s Examinations (AEM). If necessary the committee can seek advice from the student counselor, (deputy) Director of Education or others.

The Examinations Committees may follow a training course provided at TU/e level. In addition, TU/e will appoint an examinations expert to advise the Examinations Committees.

The Examinations 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 Examinations Committee with the Departmental Board (including the advisory members: the IE&IS Director of Education and the directors of the IS Graduate School).

\(^7\) The IE and IS Examinations Committee has drawn up a profile of the examiners for the various educational programs on the basis of the ‘TU/e examiner profile’.
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.

![Schematic representation of the examination quality assurance cycle](image)

The examination quality assurance system consists of three elements: examination construction, holding of the examinations and checking. 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 Examinations 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 Examinations Committee may investigate the processes and procedures used by the School to monitor and improve the quality of examinations. The Examinations 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, Conclusion of practical exercise, examination;
- 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 viewing
   - Scheduling of feedback times and way in which feedback is given (e.g. question hour, tutorial, meetings with supervisor etc.)
   - Scheduling and method of viewing
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 goals or subjects 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 Examinations 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 Examinations Committee the opportunity first to fulfill its monitoring role in relation to (interim) examinations.

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 site of the IE&IS department (https://studiegids.tue.nl/opleidingen/bachelor-college/majors/sustainable-innovation/algemeen-
The Examination Regulations are drawn up by the Examinations Committee and, as well as guidelines for the Examinations 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 IS, 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 Examinations Committee;
3. The examination contains a list of the points that may be dealt with per subquestion and an answer model;
4. The examination has been reviewed, discussed and approved by at least two lecturers. In handing-in the examination questions, the lecturer includes a memo signed by a colleague stating which colleague has reviewed the examination. The presence of the answer model is also checked. The Examinations 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 Group 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 on the instructions of the Examinations 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 Examinations 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 examinations committee randomly checks the validity of the examination questions in addition to investigations following a complaint or unexpected evaluation result. The table also shows the policy of the School in relation to these tools.

---

8 See Examination Regulations 2015 Article 2.1.1 and 2.1.2:
Both in the construction of the test and the answer model, more than one examinerator is involved, The test is checked for validity before the test (e.g. based on the available examination matrix) and reliability (e.g. based on unambiguity of the questions, criteria, length of the test, test level and difficulty).

**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&amp;IS</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 ‘examination writing’ course as part of their BKO (Basic Teaching Qualification). This course is mandatory from 2013 for the BKO course of the IE&amp;IS department.</td>
</tr>
<tr>
<td><strong>Before</strong>: peer review of examination content, nature and/or answer model. 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 IS.</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 IS are as follows:

**Procedure for handing-in examination questions and answers**

The questions for written examinations, including the cover page, are handed-in before the start of the examination week to the secretariat of the Group. This procedure ensures the availability of the examination questions independent of unforeseen circumstances on the day of the exam (illness or delay of the responsible teacher) and sufficient printed copies, but also to provide the Examinations Committee with information for monitoring the examination procedure.

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 in the examinations 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 case the required information is not available in good time, the Group secretariat informs the Director of Education.

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&amp;IS</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 Examinations 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 Examinations Committee receive a report of any irregularities arising during examinations.</td>
<td>Real Estate Management</td>
<td>If necessary the lecturer concerned is contacted by the Examinations Committee or educational management.</td>
</tr>
</tbody>
</table>

Procedures for assessment of examinations

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

1. The examinations of a part of the examination candidates checked using the answer model. After this first round, the answer model is adjusted if necessary;
2. If several lecturers are involved in the checking 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 checking 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.

Procedure for handing-in of grades

The result of all written examinations must be handed-in to the course administration not later than 15 working days after the examination, with the exception of the checking 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 Examinations 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 Examinations Committee. This shows the Examinations Committee the scale of the problem, and enables it to take the appropriate action using the authorizations which it holds.

In checking 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 IS 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 at IE&amp;IS</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 check 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.</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 Examinations 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 Examinations Committee will refer the lecturer concerned 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 (see §1.3) of the three phases of the examination quality cycle (Figure 1, section 1.3). An Examinations 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, para. 3 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, para 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 and competence examinations are only valid in the academic year in which they are taken. The Examinations 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-fraud policy is aimed at making students (and lecturers) aware of the scientific standards relating to fraud 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:\(^\text{10}\):

- The Education and Examination Regulations. These describe the content of the education and the rules for assessments and examinations for each course or group of courses, and form the basic document for students, lecturers, Examinations 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 Examinations Committee. The Examinations Committee maintains the level of education by internal monitoring of assessments and examinations in terms of content, method and level. The Examinations 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 IS 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 graduation guide 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 assessment of BSc theses is done by two assessors. This second assessor reads and jointly assesses the final report in determining the assessment.
4. A student writes a research proposal for the MSc thesis, and this is then assessed by first and second assessor. The proposal is submitted for approval to the Examinations Committee.
5. The use of assessment forms for BSc and MSc theses is mandatory in the School of IS. The Examinations 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 assessors. 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 can be from any research chair.
8. The third assessor is from the same research group as the student being assessed.

\(^{10}\) Inspectie van het onderwijs (2011), Alternatieve afstudeertrajecten en de bewaking van het eindniveau in het hoger onderwijs. Utrecht.
9. The third assessor’s tasks are, in the following order, to read the thesis, to mark the thesis, and to participate in the thesis defence.

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 Examinations 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 (ex ante); rejected research proposals must be adjusted before they are resubmitted to the Examinations Committee;
- Appointment of an Assessment Committee by the Examinations 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;

3.3 Involvement of stakeholders

The best indicator of the quality of graduates from our educational programs is the time that they need to find employment. In general all our students find jobs within three months, the majority in a much shorter time than that. The School of IS monitors the relevance of the educational programs to the employment market by means of regular alumni surveys and the alumni monitor.

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 both Schools, 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 IS
(only in Dutch)

Het doel van dit document is het vaststellen van de regels die de examenbevoegdheid bepalen van de docenten in de bacheloropleidingen Psychology & Technology (BPT) en Sustainable Innovation (BSI) en de Masteropleidingen Human-Technology Interaction (HTI) en Innovation Sciences (IS). Dit is belangrijk om de kwaliteit in deze opleidingen te borgen.

Het profiel van een examinator is vastgesteld door het AEB, zie bijlage.

*Examenbevoegdheid in de Bacheloropleidingen Psychology & Technology (BPT) en Sustainable Innovation (BSI)*

In de Bacheloropleidingen zijn de volgende personen in principe examinator: (Universitair) Docenten, Universitair Hoofddocenten en Hoogleraren.

Voor onderstaande functies zijn benoemingseisen van toepassing voor vaststelling examenbevoegdheid begeleiding bachelor eindproject:

- **AIO:**
  Kunnen uitsluitend benoemd worden als 2e begeleider bij een bachelor eindproject indien voldaan is aan de benoemingseisen. Benoemingseisen zijn: Heeft de cursus Supervising Bsc students (voor BEP) en Stage afgerond.

- **Postdocs en Onderzoekers:**
  Kunnen benoemd worden als 1e of 2e begeleider bij een bachelor eindproject indien voldaan is aan de benoemingseisen. Benoemingseisen zijn: Bezig zijn met BKO en stage afgerond of de cursus Supervising Bsc students en Stage afgerond.

- **Overige functies:**
  Voor de overige functies kan individueel een verzoek worden ingediend. Benoemingseisen zijn: minimaal cursus van Teach en stage afgerond.

Definitie stage: heeft intern meegelopen met een TU/e BEP-project en/of MSc eindproject of kan aantonen dat de medewerker deel heeft genomen aan het begeleiden van studenten tijdens een loopbaan elders.

*Examenbevoegdheid in de Masteropleidingen HTI en IS*

In de masteropleidingen zijn de volgende personen in principe examinator: (Universitair) Docenten, Universitair Hoofddocenten en Hoogleraren.

Voor onderstaande functies zijn benoemingseisen van toepassing voor vaststelling examenbevoegdheid begeleiding master eindproject:

- **AIO:**
  Kunnen uitsluitend benoemd worden als 2e begeleider bij een master thesis project indien voldaan is aan de benoemingseisen. Benoemingseisen zijn: Heeft de PROOF cursus Supervising Msc students (of de Teach cursus Supervising BSc students) en Stage afgerond.

- **Postdocs en Onderzoekers:**
  Kunnen benoemd worden als 1e of 2e begeleider bij een master thesis project indien voldaan is aan de benoemingseisen. Benoemingseisen zijn: Bezig zijn met BKO en stage afgerond of PROOF cursus Supervising Msc students (of de Teach cursus Supervising BSc students) en Stage afgerond.

- **Overige functies:**
Voor de overige functies kan individueel een verzoek worden ingediend. Benoemingseisen zijn: minimaal cursus van Teach en stage afgerond.

**Definitie stage:** intern heeft meegelopen met een TU/e BEP-project en/pf MSc eindproject of aan kan tonen dat de medewerker deel heeft genomen aan het begeleiden van studenten tijdens een loopbaan elders.

**Bijlage: Profiel TU/e Examinator**

**Wettelijk kader**

Artikel 7.12c van de wet op het hoger onderwijs en wetenschappelijk onderzoek (WHW) luidt als volgt:

1. Voor het afnemen van tentamens en het vaststellen van de uitslag daarvan wijst de examencommissie examinatoren aan.
2. De examinatoren verstrekken de examencommissie de gevraagde inlichtingen.

**Definitie examiner aan de TU/e**

Een examiner is een functionaris die verantwoordelijk is voor een individuele onderwijs- en/ of onderzoekseenheid aan de TU/e en door de examencommissie is aangewezen voor het beoordelen van studenten door middel van het afnemen van tentamens over de onderwijs- en onderzoekseenheid en het vaststellen van de uitslag daarvan.

**Kennis, vaardigheden en eigenschappen**

*De examiner beschikt over/heeft kennis van:*
- een academisch werk- en denkniveau.
- inhoudelijke kennis van de vakken waarin hij/zij onderwijst en toetst en de benodigde didactiek.
- kennis van de onderwijsvisie, het niveau en de globale inhoud van de opleiding waarin zijn/haar vak geplaatst is.
- de rol van zijn/haar vak in het curriculum en de bijdrage van het vak aan de eindtermen van de betreffende opleiding(en).
- toetsing (op enigerlei wijze vast te stellen door de examencommissie, bijvoorbeeld op basis van BKO certificaat of module toetsing DPO/Teach)
- de OER, het Examenreglement en het (facultaire) toetsbeleid, met name ten aanzien van de voor hem/haar relevante consequenties uit deze documenten.

*De examiner is in staat:*
- te beoordelen of een tentamen (of ander toetsinstrument) wat betreft inhoud en complexiteit representatief is voor de opleiding(en) en passend bij het vak.
- mondelinge en schriftelijke tentamens (of andere toetsvormen) te plannen, voor te bereiden en af te nemen.
- de prestaties van studenten op tentamens (of andere toetsinstrumenten) te beoordelen.
- de toets situatie te optimaliseren zodat de student optimaal kan presteren.
- de beoordelingsresultaten te verantwoorden en van die verantwoording mondeling en schriftelijk verslag te doen aan betrokkenen (bijv. examencommissie, beoordeelde studenten, opdrachtgevers).
- indien relevant studenten te begeleiden bij stage- en afstudeeropdrachten en -scripties en hun prestaties te beoordelen.

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11 Voor competentiegericht onderwijs wordt een apart profiel opgesteld.
12 Wanneer een onderwijs- en onderzoekseenheid die onderdeel is van het curriculum door een andere faculteit of universiteit wordt verzorgd, wordt het niveau en de kwaliteit van dat onderwijs en/of onderwijsinstituut van te voren erkend.
- fraude en/of plagiaat op te (laten) sporen.
- op een correcte wijze mondeling en schriftelijk te communiceren in het Nederlands en Engels.
- de examencommissie te adviseren.
- collegiaal samen te werken met alle betrokkenen bij het uitvoeren van zijn/haar taak als examinator.
- zijn/haar werkzaamheden naar aanleiding van zelfreflectie, feedback, kritiek of veranderende onderwijsvisies aan te passen.

Procedure voor aanwijzing examinatoren

- De examencommissie houdt een openbare lijst bij van door haar aangewezen examinatoren per onderwijsonderdeel.
- Bij het in werking treden van deze procedure worden alle medewerkers die op dat moment examenbevoegd zijn aangewezen als examinator voor de door hen onderwezen onderwijsdelen en op deze lijst gezet.
- De examencommissie moet vaststellen of een functionaris voldoet aan het profiel voor examinator. In het algemeen is het hebben van een BKO certificaat hiervoor afdoende (zie TUe_Regeling_BKO_2011).
- De examencommissie kan medewerkers die naar haar inzicht niet meer voldoen aan het profiel de examenbevoegdheid ontnemen en niet meer aanwijzen als examinator.

Vastgesteld d.d. 22-5-2014 door de voorzitters van de examencommissies.

13 Gelieve deze procedure over te nemen dan wel een vervangende procedure te beschrijven.
Appendix 2: Profile of chair, vice-chair and members of the Examinations Committee (May 2013)

Chair
- Final responsibility for carrying out the tasks of the Examinations Committee and the policies as defined by the committee as a whole
- Representing the Examinations Committee (mandate to the chair if decisions need to be taken rapidly with accountability)
- Chairing meetings
- Signing diplomas
- Specific activities/action points of the Examinations Committee
- Final responsibility for annual reports and the annual plan of the Examinations Committee
- Deciding vote on resolutions if there is no majority
- Member of the Central Examinations 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 Examinations Committee
- Participation in hearings (fraud, appeal): the chair and at least 1 member of the Examinations 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 Examinations Committee
- Personal characteristics:
  - Examination expert; at least one member of the Examinations 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 Examinations 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 Examinations Committee
Dealing with decisions of the Examinations Committee
Handling correspondence
Providing administrative support and advice; not authorized to take decisions
All 'standard' tasks of the Examinations 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 Examinations Committee for making available data which the Examinations 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:
  - Available at the TU/e for all department
Appendix 3: Quality assurance of BSc theses

Quality assurance of the final BSc project examinations (ex ante)
1. For the quality assurance of the final BSc project examinations, a second reader/reviewer is added to the BSc final project on the instructions of the Examinations Committee. The second reader/reviewer assesses the quality of the final report.
2. The final grade is determined by a joint assessment in which the process (quality of the interim assignments and interim reports, independence of the student etc.) through which the final report is reached is also taken into account. If the supervisors do not reach a common assessment, the final grade will be the average of the two assessments.
3. The final grade is determined on the basis of the competences shown below. These competences are explicitly listed and individually assessed on the final assessment form, and signed by both assessors.
4. The assessment of the BSc thesis is carried out on the basis of a completely filled-in assessment form. The first assessor hands this filled-in form to the course administration.
5. 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 are handed-in and the corresponding assessment forms.
6. BSc theses are in principle confidential, and are collected and kept by the course administration.

Quality assurance of BSc final project by Examinations Committee (ex post)
1. The Examinations Committee checks every two years the quality of the final assessments of the BSc final project reports on a random sample basis. The names of the supervisors are anonymized.
2. If there is a big difference in the assessments, the Examinations Committee first speaks to the first supervisor and the second reader/reviewer. The assessment form is used in this discussion.
3. If the assessment procedure does not meet the required quality level, the Examinations Committee will refer the examiner to the Quality Assurance & Educational Innovation Bureau. The Bureau will provide the examiner with an improvement plan and support in carrying it out.
Appendix 4: Quality assurance of MSc theses

Quality assurance for the MSc thesis by the Examinations Committee (ex ante)

1. The Examinations Committee assesses the submitted graduation proposals during the examination meeting, with the approval of the supervisors.
2. The Examinations Committee assesses the proposals on content, coherence, relevance, use of sources and suitability of the method.
3. A graduation proposal may be approved or rejected; the Examinations Committee will support the rejection of a graduation proposal with reasons.
4. If a graduation proposal is rejected, a modified proposal must be submitted for assessment to the Examinations Committee.
5. For all graduation projects the Exam Committee appoints an Assessment Committee.
6. The members of the Assessment Committee are to be selected in accordance with the criteria set by the Exam Committee for authorizing examiners.
7. 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 MSc supervisor can be from any research chair and acts as second assessor;
   c. The third assessor is a staff-member (never a PhD student) and is from the same research group as the student being assessed or from another research group and knowledgeable;
   d. The third assessor’s tasks are, in the following order, to read the thesis and to participate in the thesis assessment at the defence.

The role of the third assessor is to assure the quality of the grading process. The third assessor does not participate in thesis supervision, which is reserved for the first supervisor (who is also the first assessor) and the second supervisor (who is also the second assessor). We also note that all thesis assessors are required to have the knowledge involved in assessing a thesis and thus are in a position to assure the quality of the grading process.

8. 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 course administration.
9. The grades for the thesis are not official until the assessment form has been received by the course administration. The course administration keeps a list of the MSc theses that are handed-in and the corresponding assessment forms.
10. 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.

Quality assurance of MSc final projects (ex post)

1. The Examinations Committee checks every two years the quality of the final assessments of the MSc thesis reports on a random sample basis.
2. The names of the supervisors are anonymized.
3. If there is a big difference in the assessments, the Examinations Committee first speaks to the mentor and the second reader/reviewer. The assessment form is used in this discussion.
4. If the assessment procedure does not meet the required quality level, the Examinations Committee will refer the examiner to the Quality Assurance & Educational Innovation Bureau. The Bureau will provide the examiner with an improvement plan and support in carrying it out.