

Exam policy Department Mathematics and Computer Science

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1 Introduction

This exam policy is a coherent system of measures and facilities taken by the Mathematics and Computer Science Department to monitor and improve the quality of testing and examination. (Definition of the Education Inspectorate). This document describes the Exam policy of the Department of Mathematics and Computer Science (M&CS).

This document is a product of the Program Directors of M&CS and has been presented to the Program Committees and the Examination Committees of all programs that are offered by M&CS, and has been established by the Departmental Board of M&CS. A yearly review is foreseen because the exam policy as well as the education are still in motion, due to current developments in the Bachelor College and the Graduate School. In addition to the Exam policy an implementation plan will be established. The diagram below provides an overview of the educational programs which are covered by this Exam policy.

CROHO programs	Program	Examination Committee	Program committee
BSc Computer Science & Engineering (BTI)	Bachelor Major Software Science (Sfs)	EC Inf	PC BTI
	Bachelor Major Web Science (WbS)		
BSc Applied Mathematics (BTW)	Bachelor Major Applied Mathematics	EC TW	PC TW
MSc Computer Science and Engineering (CSE)	Graduate Program Computer Science	EC Inf	PC CSE
MSc Business Information Systems (BIS)		EC BIS	PC BIS
MSc Embedded Systems (ES)		EC ES	PC ES
MSc Industrial and Applied Mathematics (IAM)	Graduate Program Industrial and Applied Mathematics	EC TW	PC TW

Besides their own programs the Department of M&CS also responsible for third parties. For testing in these courses the same procedures will be used as established in the Exam policy M&CS, unless otherwise agreed upon with the other department or other third party.

1.1 Terminology

In this policy document the definitions of the OER 2015-2016 are followed.

Exam or examination relates to a study component and concerns an investigation into the knowledge, insight and skills of a student, as well as an assessment of the results of that investigation. Assessment is sometimes used as a more general synonym for this.

Interim or final test refers to components of an examination, which together make up the final grade for a study component. Interim tests are preparatory tests for the final test with the exception of professional skills tests as interim tests.

2 Vision on education

2.1 TU/e

The vision on education is based on the essay 'Engineers of the future'.¹ The mission of TU/e on education is to educate engineers who can deliver an important and innovative contribution to society throughout their entire career. In the educational vision of TU/e this has been translated into four main elements:

- The curriculum is derived from clearly formulated academic goals, in which competencies required of graduates are specified. These goals not only include scientific knowledge but also skills in research, design, communication and public awareness, among others (**academic engineers profile**).
- The program is built to be consistent and balanced; the education is high-level, engaging, taught by outstanding teachers, challenging and demanding for the students; the education is flexible and tailored to the individual student (**study program**)
- The course prepares the students for working in an international context (**international**)
- The competencies and facilities are optimal, including buildings, ICT infrastructure, student facilities and student counseling (**excellent teaching facilities and services**).

2.2 Department of M&CS

The vision of the department M&CS follows the TU/e vision. The vision of the department M&CS is written down in the department's strategic agenda. This agenda is revised every five years. The next agenda will be published in 2015. For each program, clear learning outcomes define what knowledge, skills and competences a student should have accomplished upon finishing the program. These learning outcomes are in line with the Dutch qualification framework and meet international standards. Starting point for these learning outcomes are the Dublin Descriptors and

¹ *Ingenieurs voor de Toekomst, Een essay over het onderwijs aan de TU/e in 2030*, Anthonie Meijers & Perry den Brok

the 3TU Criteria for Academic Bachelor's and Master's Curricula². The ACQA-instruments are used to calibrate the programs to the competences that are mentioned there. This calibration is part of the quality assurance cycle and will be repeated after several years.

Periodically the employers and alumni will be asked whether the programs still meet the requirements of the professional field.

Within the programs, the learning outcomes are translated into course-specific learning objectives and learning tracks. The program ensures a clear and sound relationship between the learning outcomes of the program, the learning tracks and course-related learning objectives, and the examination of the learning objectives. The program and course testing plans have a pivotal role in this. These testing plans describe which learning outcomes and learning objectives are tested and what type of exam is used. The exam type, the learning objective and the teaching format are supposed to relate to each other.

3 Vision on testing and examination

The vision on testing is based on the 'TU/e Exam Framework Exam Policy', the TU/e Fraud Policy, and the Contourennota Toetsbeleid TU/e.³

3.1 Vision TU/e

There are several principles that underlie the vision of the TU/e:

- Testing has two functions: 1) to determine whether the student has mastered the material (summative function); 2) to teach the student how to study (formative function). In the context of the latter function, particular attention is given to the interim tests in the Bachelor College; guidelines are agreed upon to balance the summative and formative function (see 5.3.3.)
- Teachers/examiners have the primary responsibility with respect to reliability, validity and transparency. Therefore, it is required that they are skilled for the competence Testing and Assessment. This competence is part of the University Teachers Qualification.
- The responsibility for the quality assurance system regarding the exam policy is primarily attributed to the departments, acknowledging that this can be done in several ways. The framework which the departmental quality should satisfy (Criteria for regulations and the division of responsibilities and competencies) is defined by the institution in the Framework Exam policy TU/e. Furthermore the institution is committed to providing central support in the implementation of the faculty exam policy.

3.2 Vision of Department of Mathematics and Computer Science

² *Criteria voor academische bachelor en master curricula* / by A.W.M. Meijers, C.W.A.M. van Overveld and J.C. Perrenet with the cooperation of V.A.J. Borghuis and E.J.P.J. Mutsaers. Eindhoven:TU/e, 2005. ISBN 90-396-2267-8.

³ Fraud policy, adopted on April 9th, 2015. TU/e Exam Framework Exam Policy, adopted on October 23rd, 2014

3.2.1 Purpose of assessment

The departmental vision on assessment is for the greater part based on the TU/e vision. The department distinguishes the formative from the summative function. Part of the summative function is to determine whether a first-year student has enough competences to continue the program in the second year.

Summative function: The first function of testing is to determine whether the student has mastered all learning objectives of a course. If the student's performance is sufficient to pass the minimum requirements, the student gets a certificate for this course. All courses are assessed with a method that fits the learning objectives and the learning format of a course. With increasing use of blended learning formats, new types of exams are introduced. Basically, the same policies apply to digital forms of testing, although sometimes specific procedures are needed.

Special attention is given to the Final Projects in the Bachelor and Master programs. These projects should prove that the student operates at the desired competence level. There are separate exam procedures that are adopted in the Exam Regulations of the programs.

Selection function: The Bachelor program also has a selection function in the first year. The student's exam results are used to give a Tentative Study Advice after the first semester and a Binding Study Advice at the end of the first year. This function is implemented in the design of the Bachelor program; the student should have insight into his/her performance as early as possible. In order to give a valid advice, several important, representative program learning outcomes are addressed in tests in the first year.

Formative function: In the Bachelor programs, interim tests are mainly used as a way to inform students about their progress in the course and what is expected from student and teacher to achieve the learning objectives. The purpose is to engage students and teach them how to study.. Timely feedback on these interim tests is of importance for the efficacy of the interim test. In later phases of the study, students are supposed to have learned how to study and formative examination is used less often as a means to engage students.

3.2.2 Quality of exams

The quality of an exam has three dimensions: transparency, validity and reliability.

- *Transparency:* before the exam, students are informed how they are going to be assessed, and on what topics. Afterwards, the student has the right to look into his own exam and the scoring.
- *Validity:* the exam covers the learning objectives. Content (consistent with the learning objectives), level (the degree of difficulty) and a good representation of the subject are key aspects of validity.
- *Reliability:* the exam makes a meaningful distinction between the students who easily meet the learning objectives, and those who do not. The quality of the tests plays a role here (individual ability, minimal chance of guessing the right answers, and lack of ambiguity), as do the circumstances in which the test is held (standardization and objectivity) and the method used for assessing the results (objective, not random, and accurate).

The standards regarding reliability, validity and transparency should be met for summative exams, and for formative exams as far as possible.

Quality of testing is primarily a teacher's responsibility. Therefore, the department invests in competence in the field of examination and assessment. Almost all teachers have the University Teachers Qualification (UTQ =BKO), which includes the competence Testing and Assessment. These teachers can:

- Apply quality standards (based on the guidelines formulated by the Examination Committee) and the regulations of the OER when constructing and scoring tests.
- Develop instruments that are necessary for examination (testing material, scoring models, scoring guidelines).
- Evaluate and analyze the exams.
- Take the regulations and guidelines into account when it comes to constructing, taking, scoring, analyzing and archiving tests and other exams.

The Departmental board facilitates and stimulates teachers to get this qualification (e.g. with the '100% UTQ in 1000 days' project, started in 2013).

The educational management takes measures to monitor and improve the quality of the exams. Quality assurance of exams is part of the quality assurance procedures of the department. These procedures are described in the self-evaluation reports.⁴

Extra quality assurance is achieved with a 'quality assurance committee'. The exam policy of the department M&CS is characterized by the importance that has always been placed on the quality assurance review by the Board of Examiners. Since 2006, the Examination Committee has a 'quality assurance committee' subcommittee, which advises the Examination Committee with respect to the quality of final projects and exams. This quality assurance committee use the course evaluations and the annual reports of the Examination Committee to provide feedback to the Examination Committee and the Program Directors. They also use their own investigation methods.

3.2.3 Preventing fraud

The study yield should be a result of the student's own skills, knowledge and efforts. To ensure this, there are regulations to prevent fraud and plagiarism (see: [chapter 6](#)).

Special attention will be paid to digital exam methods in this policy when they become an integrated part of the testing methods.

3.2.4 Interim tests

Interim tests are preparatory tests for the final test with the exception of professional skills tests as interim tests. According to the guidelines that the Bachelor College provides, the main function of an interim test is formative; the students need to know where they are in the learning process.

⁴ See in Sharepoint <https://sites.win.tue.nl/deof/mso/Shared%20Documents/Forms/AllItems.aspx>.

Therefore, timely feedback after interim tests is of importance; a maximum of 5 weekdays is required (see OER).

The interim tests also have a summative function. For instance: in the Bachelor College the interim tests determine between 30-50% of the final grade (see the Guideline for the TU/e Bachelor College (*Richtlijn TU/e Bachelor College*), adopted by the Executive Board on April 5th, 2012). The teacher can decide that collaboration between students is allowed, if this is in line with the function of the exam.

In general, these regulations will also apply to the master courses. For example, interim tests cannot be retaken, but it is up to the teacher to decide what is most adequate in each situation, since the regulations for the master courses are not (yet) as strict as those for the bachelor courses.

In 2015, new policy at institutional level concerning these interim tests will be developed.

4 Procedures and other instruments to assure assessment quality at program level

4.1 General instruments

Chapter 7 of the Higher Education and Scientific Research Act (Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek) includes prescriptions for the organization of higher education programs. According to the Inspection of Education the most relevant testing issues are:

- The Education and Exam Regulations (OER). This document describes for each program or group of programs the content of the program, exams and other assessments. It is the basic document for students, teachers, Examination Committees and management that describes the procedures, and the rights and obligations of the students and the program (art. 7.13 WHW);
- The Examination Committee. The Examination Committee monitors the level of the program by keeping internal supervision on the examinations and also on the content, level and method of examinations. The Examination Committee has the task to determine whether the graduate has achieved the learning outcomes as described in the education and examination regulations (art. 7.12, 7.12a and 7.12b WHW). The Examination Committee meets biannually with the Board about the annual report and the annual plan.
- The Examiners. Examiners assess students, thus making an important contribution to the safeguarding and promoting of the level of the students (art. 7.12c WHW);
- Compliance with internal rules and procedures.

More information on the role of the Examination Committee and the program committees can be found in [chapter 8](#).

4.2 Quality assurance cycle

In order to facilitate the teacher in his/her efforts to achieve the quality required, the rules and guidelines (Examination Regulations) prepared by the Department Educational management and

Examination Committee are actively brought to the attention of the examiners (teachers) and other interested parties. This information is easy to find and access on the [Teachers portal](https://sites.win.tue.nl/ttp/default.aspx) on Sharepoint (<https://sites.win.tue.nl/ttp/default.aspx>).

Quality is measured on a regular basis, making it possible to monitor quality. Important sources of information for the above are the *course evaluations*, reports by the Evaluation Committee, reports on the discussion of the above in program committees, and success rates. If necessary, the first tier of quality assurance will involve the Program Director discussing results with the teacher responsible. If necessary, agreements on the realization of improvements will be made too. The Examination Committee has access to the results of all quality measurements and to the results obtained by the Evaluation Committee. The Examination Committee will use this information when seeking to safeguard quality.

Examples of examination-related questions that are included in the course evaluations follow below:

- Are you satisfied with the method of assessment?
- Were the criteria used for judging/grading the assessment clear to you?
- Was the examination relevant?
- Did you get enough feedback while working on your assignment or afterwards?

If the Examination Committee believes that an exam and/or the assessment procedure is/are not of the quality required, it will discuss this with the Program Director. The same will apply if it is observed that earlier improvement plans have not been successful. The Program Director will then ensure that satisfactory measures are put in place at this time. In the worst-case scenario, the Examination Committee will be able to withdraw the examination authority that has been conferred on the teacher.

4.3 Annual program testing plan

The Program Directors are responsible for ensuring that all program learning outcomes are translated in the various learning objectives and that they are tested in the courses, in accordance with their importance. To this end, they provide a program testing plan. The purpose of this plan is to guarantee students, as well as their future employers, that all learning outcomes are assessed in the study program and that the students are well qualified.

The program testing plan differs from the course testing plan in that it encompasses the whole program and the program learning *outcomes* (instead of the course learning *objectives*). The report shows, if the student has completed the program, that the student can be assumed to have the necessary knowledge and skills. The Examination Committee can use this document to check whether all learning outcomes are included and assessed in the program. An update of this program testing plan is provided with changes in the programs, using the results from the course evaluations and the course descriptions. The plan will be discussed in the Departmental board meetings, the Educational Management meetings and the Program Committees.

This program testing plan consists of:

- A report on how the courses' learning objectives relate to the program learning outcomes and the tests: are all learning outcomes and learning objectives tested? In which course is

which learning outcome assessed and how (interim tests and final exams)? Are all learning outcomes tested in a meaningful way? Is the testing of the learning outcomes in accordance with their importance?

- A general report on how the departmental vision on education and testing is realized in the examination of the courses.

This analysis can result in an action plan to improve the testing.

4.4 Periodical review of the curriculum

The relationship between the program and the learning outcomes is periodically reviewed in the self-evaluation reports. They are reviewed every six years when the programs are audited. If the curriculum has changed during this period, the link with the learning outcomes should be made clear.

Proposed changes, such as change of learning tracks or cancelled courses, are subject of discussion in the program committee, well before the OER is adopted. To keep track of these changes, they are recorded in the annual reports.

5 Procedures and other instruments that assure assessment quality on course level

This chapter describes the instruments, mainly procedures, that are used in the department for assuring assessment quality on course level.

5.1 Step 1: Design and describe examination format

5.1.1 Step 1a: describe basic examination format

The basic information regarding the examination is included in the course information in the digital study information system (OASE). The Education and Examination Regulations (OER) refer to this. Herewith the information is also to be considered as an integral part of the (OER) regulations. For subjects in the Bachelor College a new format has been adopted by the Program Directors on December 4th, 2013. In this regard, M&CS follows the regulations of the Bachelor College. The box below provides an overview of relevant elements for the assessment that are recorded for both Bachelor's and Master's courses.

The relevant basic information about the *final test* (e.g. exam format) should be available to the Program Directors in these course descriptions, on April 1st of the preceding year, at the latest. This information will be published after adopting the OER.

1. The exam formats defined in the Program and Examination Regulations (written final test, oral exam, electronic final exam, quizzes, individual assignment, group assignment, notebook assignment, presentation/reading, peer review, skills exam, report)
2. The exam components and corresponding course codes
3. Weighting of the exam components
4. The quartile in which exams are administered
5. Link to study guide

The dates of and locations for the interim and final exams are set out in the digital learning and working environment (OASE). exams. Annually, before August 1, the Departmental Board shall draw up a timetable for written final tests for the program, which will be published in the first week of August at the latest. The scheduling of interim tests and other exams should be available at the start of the course, where possible. Times and dates can be altered with permission of the Departmental Board. If a scheduled final exam is within 8 weeks, the date and time may not be altered.

5.1.2 Step 1b: Describe more detailed exam information in the course study guide (‘studeerwijzer’)

Detailed information about education, instructional formats and the examination process for each course is provided in its study guide. This information should be available at least one week before the start of the course.

The box below provides an overview of the relevant elements for examination, described in the study guide; for Bachelor College courses a connection should be made to the agreements that have been made about this by the Program Directors Council (“opleidingsdirecteurenoverleg”).

1. Test scheme: Format of interim tests and final tests, connection between learning objectives and exam parts
2. Assessment material
3. Data feedback and/or inspection
4. Planning the times at which feedback is given and how
5. Planning and process of inspection
6. Determination of final grade
 - Procedures for determination of the final grade (weight parts)
7. On assignments:
 - Assessment criteria
 - Return procedure

Thus, before participating in a course, the following will be clear: what will be examined (linked to the objectives for or subjects covered by the course), how students will be examined, when exams will be administered, any consequences when a student passes or fails a test, how the various tests contribute to the final grade for the course, the exam method used (and by whom), etc. A description of this nature ensures that transparency is achieved; it forces teachers to consider in advance how to give shape to the examination process for their particular course and it enables the examination committees to implement their monitoring duties better.

The Study Program Committee (PC) monitors the quality of the course descriptions provided in the TU/e digital learning and working environment. Its checks will always include whether the information provided is complete. Information about exams will be submitted to the Examination Committee (EC). This gives the Examination Committee the opportunity to fulfill the monitoring role it is to play in relation to exams in advance. The PC and the EC also have an advisory role in relation to the OER as a whole, the Departmental Council has right of consent and the OER is ultimately adopted by the Departmental Board (for an overview of the functions of all of the various committees, see [Appendix 2](#)).

5.2 Step 2: Construction of exams

Exam procedures are adopted annually in the Program and Examination Regulations (OER) and in examination regulations for programs. For both bachelor and master programs, these can be found on the [Teachers Portal](#) on Sharepoint.

The Examination Regulations are prepared by the Examinations Committee and, besides guidelines for the Examination Committee, also contain guidelines on the preparation, administration, assessment and analysis of tests. The starting point for the above is the model OER and the model Examination Regulations. Other guidelines for the examination process were prepared upon the introduction of the Binding Recommendation (2009) and were updated upon the introduction of the Bachelor College (2012).

An overview of the guidelines for written final tests follows below. In [Appendix 1](#) a short description is given of all instruments that are used to ensure reliability, validity and transparency.

5.2.1 Procedure for constructing written final tests

1. The test is constructed under the responsibility of the examiner that the Examination Committee has appointed. In most cases, this is the teacher. The test has to meet the requirements of article 4.1 of the Examination Regulations and chapter 4 of the Program and Examination Regulations (OER).
2. The learning objectives of the course are the starting point for the test construction. The relationships between the learning objectives of the course and the test items can be made explicit by the teacher. It is advised to use a test matrix for this matter.
3. The verifying colleague checks whether the test is feasible and whether the test meets these requirements of the Examination Regulation (4.1):
 - (1) The test questions and assignments do not go beyond the learning objectives that had to be studied in the course.
 - (2) The test questions and assignments are a balanced representation of the subjects and learning objectives of the course.
 - (3) The time period that is available for the test is reasonably enough to answer all questions and assignments.
 - (4) The questions and assignments in the test are clear and unambiguous. The formulation clearly indicates for students how detailed the answers are supposed to be.

This peer-verification is part of the teacher's responsibility. He/she is expected to organize an independent verification of each final exam by a peer. The Program Director sees to this procedure. The study program secretariat administrates the name of this verifying colleague.

Note: For master courses the nature of this check will depend on the specialized technical expertise that is available.

4. For each test the teacher provides the required cover sheet with information about examination aids that are admitted, the number of points for each question, how the grade is calculated and some rules to prevent fraud. This cover sheet is added to the test.
5. Teachers inform students about the exams in the course description and in the study guide.

6. Students get the opportunity to practice written test questions that are similar to those in the test (e.g. with past tests).

5.2.2 Procedure for constructing final assignments and other types of exams

1. The assignment or exam is constructed under the responsibility of the examiner that the Examination Committee has appointed. In most cases, this is the teacher.
2. The learning objectives of the course are the starting point for the construction of the assignment or exam. The teacher should be able to show the relationships between the learning objectives of the course and the assignment or exam.
3. A verifying colleague checks whether the assignment or exam is feasible:
 - (1) The assignment or exams do not go beyond the learning objectives that had to be studied in the course.
 - (2) The time period that is available for the assignment or exam is reasonable to finish it.
 - (3) The assignment or exam is clear and unambiguous. From the formulation it should become clear for the student what is expected.

This peer-verification is part of the teacher's responsibility. He/she is expected to organize an independent verification of each final exam by a peer. The Program Director sees to this procedure. The study program secretariat administrates the name of this verifying colleague.

Note: For master courses the nature of this check will depend on the specialized technical expertise that is available.

4. Teachers inform students about the assignment or exam in the course description and in the study guide.

The other examination elements for a course may be of such a varied nature that it is not practical to adopt a uniform procedure for their construction. Naturally, the requirements of transparency, validity and reliability will continue to apply for the overall exam. However, interim exams must explicitly be considered as part of their bigger whole.

5.2.3 Procedure of reproduction of written final tests

1. The study program secretariat makes a schedule for the reproduction of the written final tests in each exam period. Each examiner will be informed of the latest date by which an exam has to be submitted to the study program secretariat. The study program secretariat will ensure that the test is reproduced and present at the test location and will archive these tests. The reproduction and storage of the paper and digital tests is done in a secured environment to prevent theft or other criminal acts. (See article 5.1 in the Exam Regulations 2014-2015).
2. The final version of an written final test will be submitted to the program secretariat on time. The relevant examiner will also indicate the name of the verifying colleague with whom the test and, if applicable, the answer model⁵ has been discussed.

⁵ An answer model provides an enumeration of correct – sometimes also partially correct or incorrect answers. And also describes the number of points that are awarded for (partially) correct answers. If various correct answers are possible, the assessment criteria (what distinguishes a perfect answer from a partially correct and incorrect answer) are provided.

5.3 Step 3: Holding an exam

5.3.1 Procedure for holding written final tests

1. The Study program secretariat notifies the teachers who will be expected to be present as subject-matter experts during a written final test. In principle, this will be the examiner. There is a central TU/e organization that ensures that a sufficient number of invigilators are present. The invigilators are instructed thoroughly on the protocols to be observed in relation to written exams (also see 6.4). In the event that the subject-matter expert cannot remain present when the examination period is prolonged, he has to notify the study program secretariat beforehand. This secretariat will secure a replacement invigilator.
2. The study administration is responsible for timetabling written final tests and processing test results. It will ensure that a room is arranged that is appropriate for the number of students participating in the written final test and the nature of the test.
3. If a final test is to be administered as a 'notebook' test, the examiner will be responsible for ensuring that effective additional measures are put in place to prevent fraud. The provision of a 'safe/quiet exams' environment may be one of these measures.
4. After a written final test, the test papers of the students will be collected by the teacher and/or the invigilator. The teacher will then take charge of them or they will be given to a security guard, who will put them in the safe for collection by the teacher.
5. Students may take exam questions and assignments home, unless the examiner has reasonable objections.
6. The examiner has the responsibility to store the test papers in a safe (physical or digital) place, with no unauthorized access for others.

Specific measures to prevent fraud before, during and after the exam are described in [Chapter 6](#).

5.3.2 Procedure for holding an oral final test or Competence Assessment

Guidelines on the administration of oral exams are set out in the Examination Regulations and the OER.

1. Prior to an oral exam, students are informed about the subject matter that will be examined and which criteria apply. It will also be clear to them whether other criteria apply in addition to substantive criteria (answer development and language use, etc.).
2. The examiner ensures that the atmosphere during an oral test is quiet and calm (no telephones, no people walking in and out, etc.), so that both examiners and students are able to concentrate on the test.
3. It is advised that the questions be ready prior to the oral test and that notes are made on the quality of an answer during the oral test itself.
4. After an oral test, the examiner(s) prepares an assessment form and a protocol ('meeting report'). The protocol may consist of an overview of questions and the notes made during the oral test. The examiner will retain this protocol for at least two years.

The OER sets out that in case of an oral examination or oral Competence Assessment component is taken, a second person, who has the power to be examiner, needs to be present. However, the department allows some flexibility in this matter, taking into account teachers workload. The main

goal is that there is some evidence of the examination process, that enables a second opinion in the event that student and examiner disagree about the exam result. This can also be done with the use of e.g. audio recording or detailed reports. Students can request for a second examiner in their first attempt of the exam. Teachers have to notify the students in the study guide of this right. In the event of a re-examination a second person is always required.

The oral administration of exams or competency assessments will be in public (as set in the Higher Education and Scientific Research Act, WHW). In practice, it is not desired that students who will take the same oral exam as the candidate within a few months' time, can observe the exam. Their presence is therefore excluded. Further, there is to be no communication about the exam between the examiner and the guests, or the exam candidate and the guests during the exam.

5.3.3 Re-examinations

Students who would like to have a non-regular re-examination have to apply to the study counselor. Teachers can redirect students to the counselor, who will refer the students to the examination committee. The examination committee can mandate the study counsellor to decide if the student is entitled to a re-examination. If so, the study counselor or examination committee can request the teacher to provide a new exam.

If the examiner proposes an exam format that differs from the format described in the study guide (e.g. an oral exam for re-examination instead of a written exam), the examiner needs permission of the examination committee.

5.4 Step 4: Analyzing and scoring

1. The examiner ensures that the examination is assessed uniformly in case of multiple assessors and that scoring procedures are observed. These procedures are described in the OER. This could be achieved, for example, by providing the assessors with an correction model. On request, the examiner is assumed to be able to explain how uniformity is ensured.
2. The grading method is such that the student is able to ascertain how his test results were established. The study guide and the cover sheet of the exam should give clear information about the composition of the grade. The study guide explains which grade is sufficient to pass the course or refers to the OER.

In situations of doubt, a second assessor is consulted. In accordance with BC-OER article 5.7, sub 8:

“ If the final grade for a study component that is part of the student's first-year phase is assessed with a 5, and the result affects the binding recommendation on the continuation of studies, then the final test must also be assessed by a second examiner. The final result is determined after consultation between the first and second examiners.”

This second correction is required for all first-year major courses and all electives at basic level 1, but the department of M&CS considers it important for all courses. Therefore, this second correction is recommended for other final tests in bachelor- and master courses.

3. Upon request, the examiner will be able to provide Program Directors or the Examination Committee with a written insight into how a grade was composed.
4. Where prompted to do so by circumstances, the Program Director and/or the Examination Committee will be entitled to stipulate the use of an answer model, provided it gives reasons for doing so.
5. The student administration registers the grades in the Student Information System (OWIS) and announces this to the students.

5.4.1 Procedure for grading assignments

1. Students are informed about the assessment criteria applicable before an assignment is set.
2. The submission procedure and requirements applicable for an assignment are announced via the study guide.
3. In the first week of a course, the deadline for the final assignment and the interim assignments is communicated to the students via the study guide. The deadline for the final assignment will be considered as the date of the final test.
4. Where courses conclude with a significant group assignment (≥ 2 students), checks will be carried out to identify anyone who is free-riding. These checks could include peer assessments or the requirement for students to set out their individual contributions in a report.
5. A second marker will be consulted if there is any doubt.

5.4.2 Safeguarding the quality of final assignments for BSc and MSc programs

The department has put regulations in place to safeguard the quality of the assessment of Bachelor final projects, internships, and the Master's graduation project in the MSc programs. These 'graduation regulations' were prepared subject to the responsibility of Program Directors, discussed with the program committee in order to obtain its advice and then adopted by the examination committees. Students are kept up-to-date via the study guide. These 'regulations' have been included as an appendix to the Examination Regulations. The protocols are accompanied by lists of criteria, a guide for numerical assessment and the model for the assessment form to be used.

The regulations clearly set out by whom, when and how the individual assessment is to be established (including which aspects are to be taken into consideration and to what extent and which partial assessments can or cannot be compensated by other partial assessments). The procedure to be observed in the event of a 'not satisfactory' assessment is set out too.

The use of the assessment forms based on the model stipulated is compulsory. The Examination Committee has the right to inspect all assessment forms and supervises compliance with protocols. The Education Administration monitors aspects such as the composition of the Graduation Committee.

5.5 Step 5: Procedure administration of grades

Examiners are responsible for submitting test and exam results to the Education Administration on time. The grading periods permitted for exams and practical assignments are set out in the Program and Examination Regulations. Where an exam involves a written test, the Education Administration

will send the teacher participants lists (in a hardcopy and/or digital format) for the target groups in question. The grades can be entered on these lists.

A procedure is in place in the department on the *late* grading of written final tests:⁶

- Two working days before the latest date for submission, the examiner will receive an e-mail from the Education Administration if results have not been submitted yet. The purpose of this e-mail will be to ask when the results in question can be expected. If a situation has arisen that is beyond the control of the examiner, he/she will be able to ask the Examination Committee to grant him/her a longer grading period (cc the Program Director), provided his/her request is accompanied by reasons. The examiner will also inform students that results will be announced later than agreed.
- Shortly after the end of the exam period, the Examination Committee will be sent an overview of final tests, latest submission dates and the submission dates actually achieved. This will give the Examination Committee an insight into the extent of any problem. It will then be able to take action to resolve the situation subject to the powers conferred on it.

5.6 Step 6: Safekeeping of exams

All scored final tests, whether written answers or protocols of oral tests, including the questions and answering models if available, are stored for at least 2 years by the examiners. The same applies to reports of final assignments. The department takes care of storage facilities. The Exam Regulations include guidelines to the administration and archiving of exams.

It is important that procedures concerning the archiving of test papers prevent fraud and are practical at the same time.

5.6.1 Safekeeping of Bachelor's and Master's Theses

Bachelor's and Master's theses, SEP reports and their assessment forms are stored for at least 7 years by the Study Administration (See OER). More details concerning the administrative process and archiving are described in the Exam Regulations.

5.7 Step 7: Procedure of course evaluation

- 1) Evaluation forms: After each course students are asked to fill in evaluation forms. The information resulting from these questionnaires is completed with information on the success rates, information from small discussion groups and the teacher's response to the evaluation. The evaluation forms contain standard questions that enable benchmarking with respect to testing and other things, and leave room for course specific questions. E.g. Are you satisfied with the contents of the tests/assessment? (for example the feedback you received by means of the interim tests, the level of the final test, reflection of the subject material, the relation between practice opportunities, interims tests and the final test, etcetera)

⁶ See the OER for information about grading periods.

- 2) Teachers response: the teachers are asked to respond to the results of the evaluation. This teacher response form includes a question whether the original course design has been followed. E.g. whether there were more or less interim tests in the course than was described in the study guide.
- 3) Evaluation committee: The responses are examined and discussed in the evaluation committee. This committee consists at least of the Program Director, the study counselor, and the quality policy officer. The Program Director has the responsibility to act on these evaluations if necessary and to inform the study program committee of proposed actions.
- 4) Study program committee: In this committee, together with the relevant Educational Advisors the evaluation forms and the reactions are discussed at least twice a year. The Program Director can be advised to act on them, if this has not already happened.
- 5) Examination Committee: collected complaints about examination are discussed with the departmental board every six months.
- 6) Management discussion: the Program Directors discuss trends and special issues in the meetings of the Departmental Board and the Educational Management Team.

6 Fraud prevention policy

The value of an awarded diploma should be above reproach. Therefore it has to be ascertained that a student earns this diploma as a result of his/her own efforts. The department is committed to preventing fraud in order to certify the civil effect of a diploma. Fraud is a serious business. Cases of possible fraud must be dealt with, with extreme care. It is very important for the students to know exactly where they stand. Careful action is needed in case fraud is suspected.

6.1 Definition of fraud

Fraud is defined in TU/e Fraud Policy as: all acts or failures to act by or on behalf of a student, whereby forming a correct judgment of the students' knowledge, understanding and skills is wholly or partly made impossible for the examiner and / or deliberately influencing (parts of) the examination process with the aim of influencing the outcome of the examination. This is particularly relevant for tests, other exams and applications for exemptions.

Examples of fraud: (from Examination Regulations)

- Plagiarism: products of students which are (partly) copied from others without referring to the original author.
- actively cooperating in giving his/her own work to others, who could submit said work for assessment as their own work;
- when a student chooses not to use his/her own clicker or to use more than one clicker during an exam;
- using non-permitted sources during an exam.

6.2 Fraud prevention

The fraud policy of this department is based on the TU/e fraud policy and the Exam regulations. The core of this policy is to guarantee that students are reliable, trustworthy, responsible, and independent scientists, who know how to handle scientific-ethical situations well. Therefore, motivation, rationalization and possibilities of fraud should be discouraged. Following the university policy, there are four ways to prevent or act on fraud:⁷

- 1) Inform: Students and teachers know the rules and regulations regarding examination and scientific integrity, and sanctions that are imposed if fraud regulations are violated. The department is responsible for actively informing the student about this.
- 2) Prevent: situations that provoke fraud are prevented.
- 3) Detect: situations where fraud has been committed, or where there is a suspicion of fraud, are detected and acted upon. Clear procedures improve the chance of detecting fraud.
- 4) Impose sanctions: clear procedures are to be followed if fraud has been suspected, including similar sanctions for similar offences. The Examination Committee has an important role in this respect (see Chapter 9).

6.3 Inform students about regulations and scientific integrity

To inform students is not only to reduce motivation to conscious fraud, but also to prevent unconscious fraud. Appropriate behavior is described in the Code of Scientific Conduct ('TU/e Gedragscode Wetenschapsbeoefening'). Fraud is defined in the Exam regulations, as are the sanctions.⁸

Students are informed about this Code in several ways:

First, the Code of Scientific Conduct is mentioned on several occasions during their study:

- In the students' introduction into the department and the program, this information is given.
- PhD and Master's students that have not followed the Bachelor program at the TU/e need to sign the Code of Scientific Conduct at the start of Graduate School.
- The Code is mentioned in a prescribed text at all diploma ceremonies.

Furthermore,

- Regulations are mentioned on the websites of the study programs, in the Student Statute and in the OER.
- Teachers describe some specific relevant regulations concerning their courses in the study guide and refer to Exam Regulations and the OER.
- The Bachelor program includes lessons on the importance of scientific citations and how to use them. This is part of the professional skills program (see OER BC).
- For students who start with a Master's after having studied elsewhere, scientific citations and integrity etc. forms part of the introduction of the department.

⁷ See page 6 in Fraud Policy Education TU/e

⁸ http://static.studiegids.tue.nl/uploads/media/BMSc_RR_inf_2014-2015.pdf

- Teachers are informed about the rules and regulations with respect to fraud in the UTQ-track.

6.4 Prevent situations that provoke fraud

In order to prevent fraud in exam settings, several measures are taken depending on the nature of the assessment. For instance, teachers develop tests that include measures to prevent fraud (e.g. different versions).

Every year the testing system is evaluated and improved. This is done at university level and/or by the Examination Committees and by the Program Directors.

If the use of digital or blended assessment continues to increase as expected, this exam policy will be made more specific on the use of digital devices, webcams, online cooperation etc.

6.4.1 Written tests taken on paper or using a digital device

Most exams are written tests. The university board facilitates this kind of testing and is responsible for the practical organization of final written tests. For these final tests, rules and regulations are described in the Regulation Central Exams TU/e ('Regeling centrale tentamenafname TU/e'). Rules with respect to fraud are for example:

- Every written final test is provided with a cover sheet with information about the allowed aids, the most important rules and some examples of fraudulent behavior. The teacher is responsible for this cover sheet. A template is available.
- Students have to identify themselves in case of written final tests. Then, the examiner ascertains that the student that is present, is actually taking the test.
- General services (DAZ) prepares the rooms in a way that does not provoke fraud.
- For exams with digital devices the TU/e has developed a 'quiet assessing' digital test environment, to prevent that students can use programs and connections that are not allowed.

6.4.2 Assessing assignments

With assignments, fraud usually happens in two different ways:

- o Texts are taken from the Internet without mentioning the source.
- o Texts are copied from other students.

In the latter case there is a fine line between student collaboration and copying texts. This lack of clarity is often enlarged in the event that group assignments are given prior to the final assignment. Thus it is essential to clearly communicate to students that this last assignment must be carried out individually. The final assignment must be formulated clearly along those lines, so that it can be assessed whether the student did indeed work independently on the final assignment.

An exam is a means to determine the knowledge, insight and skills of a given student, as well as a way to assess the results of this research. The idea is to assess each student individually. During a written test, the student cannot expect to receive support from the examiner. It is important for students to know that the same applies to an assignment. In preparation for the assignment, students can be given help with practice exercises. It must be clear to students when the actual examination will start (the moment you make the assignment available) and when the examination will be completed (the final deadline for submission of the final assignment).

Group assignments

For group assignments, cooperation with other students is allowed and expected. An important issue relevant to these types of assessments is social loafing, whereby some students put substantial less effort into the assignment than others. Therefore it is stated that for program parts where groups assignments (≥ 2 persons) are 40% or more of the final grade, measures should be taken to ensure that all students have an individual part in the group product. E.g. with peer assessments or by making clear what part of the assignment is done by which student.

6.5 Detection of fraud

Alertness is expected from the teachers, examiners and invigilators during an exam.

Teachers are informed about how to act with fraud; this information is available at the Teachers portal on Sharepoint (<https://sites.win.tue.nl/ttp/default.aspx>).

6.5.1 Detecting plagiarism

Plagiarism is copying text of other authors without references to the right sources. Digital tools are available to lecturers to check whether assignments and other work have been published elsewhere inside or outside the university. In 2015 a new temporary plagiarism detection system is available (Ephorys), which teachers can use.

Teachers are advised to first check whether Bachelor's and Master's Final Project Reports are not (partly) copied products, before grading the project.

6.5.2 University measures for early detection of fraud

The university provides facilities to prevent fraud. For instance, there are professional invigilators. Their professionalism is ensured by screening their attitude, by regular training and monitoring.⁹

6.5.3 Procedure if student is suspected of fraud

This procedure is described in the document 'Fraud policy TU/e Education'. In short:

- Examination Regulations: If a student is caught performing fraudulent behavior or there is a suspicion of fraud, then the invigilator or examiner must make a written report and ask the student to cooperate in collecting evidence. The suspected student is given the chance to

⁹ See Fraud Policy TU/e Education, April 9th 2015

add written comments next to the report of the invigilator. This report and the comments are submitted to the Examination Committee of the program of the student in question.

- The student is allowed to finish the exam or assignment.
- The Examination Committee examines the case and the evidence and concludes whether the student committed fraud or not.

6.5.4 Impose sanctions

The Examination Committee also imposes sanctions if necessary. Sanctions should be similar for similar cases. Therefore this is a point of discussion in the Advisory committee for Exams Bachelor (ACB) en Advisory committee for Exams Master (ACM) meetings.

7 Options for complaints and appeal

Students that do not agree with or do not understand the scoring or the testing, or do not agree with sanctions that are imposed in the case of fraud, can take the following steps:

1. The first step is to ask the examiner. Students can have a look into their exams and the scores, to learn and to check the scoring. The responsible teacher announces at the latest with the publishing of the grades, when, how and where students can look into their exams.
2. If the student and the examiner do not agree, the next step would be to appeal to the Examination Committee and ask for a second opinion. The Examination Committee decides whether the examiner has taken the right decision.
3. If the student does not agree with the decision of the Examination Committee or sanctions that are imposed, it is possible to appeal to the Examination Appeals Board ('College van Beroep voor de Examens'). Further appeal is possible at the Appeals Tribunal in the field of Higher Education ('College voor Beroep voor het Hoger Onderwijs').¹⁰ The Appeals Tribunal gives a final ruling on such an appeal.

All relevant information about regulations, including the OER, the Student Statute, the complaints regulations (on the examination process and related aspects) and possibilities for appeal, is available to students and easy to find and consult.

8 Responsibilities of the Examination Committee and Departmental Board

The Program Committee The Program Committee is responsible for monitoring-related activities. It advises on the Program and Examination Regulations (OER), amongst other things. It also assesses implementation of the OER on an annual basis. It does this by monitoring the quality of education in its own program, amongst other things.

¹⁰ <http://www.cbho.nl/>

8.1 The Examination Committee

Their duties and powers are laid down in the Department Regulations.¹¹

8.1.1 Duties and powers:

- 1 **Legal responsibility to safeguard quality.** The Examination Committee plays a specific role in the quality assurance cycle for final exams given the legal responsibility it has to safeguard the quality of all exams and final exams in higher education.
- 2 **Monitor quality and processes.** It monitors the exit level for the program and the quality of the examination process within a program.

The Examination Committee implements this legal responsibility by:

- safeguarding the quality of the exit level for the program
 - establishing whether an exam participant meets the conditions that make it possible to award him/her a degree
 - identifying risks that could damage the quality of the examination process and putting forward proposals on the limitation of these risks to the competent authority.
 - monitoring developments within and outside the organization that could improve the quality of the examination process.
 - The Examination Committee submits an annual report to the Departmental Board and the central committee for quality care in education (CCKO). Every six months there is a meeting with the chairman of the Examination Committees and the Departmental Board.¹² The chairmen report back to the committee.
 - The annual report will contain an annual plan for the Examination Committee. The annual plan sets out the intentions of the Examination Committee for the year following the year to which the reporting period relates. These intentions will involve the further implementation or improvement of quality assurance.
- 3 **Examining quality assurance.** The Examination Committee could assess processes and procedures that the educational management use to monitor and improve the quality of the examination process.
 - 4 **Power to appoint.** The Examination Committee also has the power to appoint examiners.

8.1.2 The place of the Examination Committee in the organization

- The Examination Committee is an implementing and advisory body that forms part of the Departmental Board. This committee has the authority to establish whether a student meets the conditions set out in the OER in terms of the knowledge, understanding and skills necessary to obtain a degree, and the authority to award degrees. The Departmental Board

¹¹ See <http://www.win.tue.nl/reglementen/FacRegIW&I.pdf>

¹² in FBO/e

adopts the OER subject to which the Examination Committee carries out the duties conferred on it. The composition and working methods adopted by the Examination Committee guarantee its independent and expert performance.

- The Examination Committee reports its findings on the quality of examination to the Departmental Board and other interested parties.
- The Examination Committee has ultimate responsibility for ensuring the quality of exams and final exams. The chairman, vice-chairman, members and secretary are appointed by the Departmental Board.

8.1.3 Composition of Examination Committee

M&CS observes the model regulations, in which the following starting points apply:

- (a) M&CS has four examination committees: one for mathematics education (BTW+IAM), one for computer-science education (BTI+CSE) and two separate committees for the multidisciplinary, interdepartmental Master's programs (BIS and ES). An examination Committee consists of a chairman, a vice-chairman, one external member and one or more programs teachers. A secretary supports the committee. Advisors can be consulted, e.g. experienced students.
- (b) The TU/e has created a profile that describes the required competences and qualities of the committee members and the statutory duties they have.¹³ The department has to base their member profile on this document to ensure that all legal obligations are covered
- (c) In the interest of alignment, one chairman has been appointed for all of the computer-science examination committees.
- (d) To be able to perform its duties as optimally as possible, the majority of seats in an examination committee will be held by experienced teachers with subject-matter expertise. The composition of the committee as a whole must reflect the areas of expertise set out in the Department Regulations section 2.10B and Examination Regulation Appendix 4 (also see Appendix 3 in this policy document). Each committee will also have an external member, as referred to in art 1.2 of the Examination Regulations.
- (e) A reserve member will be appointed for each member.
- (f) Given the expertise required, the Departmental Board for M&CS strives to secure the long-term involvement of the (vice) chairman and members of an examination committee. Therefore, members and (vice) chairmen will generally be re-appointed after two years. If possible, members will have varying lengths of service.

8.1.4 Facilities for examination committees

Various training, advice and support possibilities are available to examination committees. The chairmen and secretaries¹⁴ of the examination committees for the Department of M&CS participate in university-wide consultation bodies, namely the Advisory Committee for Bachelor's Examinations (Adviescommissie Examens Bacheloropleidingen (AEB)), the council for the chairmen

¹³ This document was adopted on December 12th 2013.

¹⁴ At the current time, all four examination committees have the same secretary.

of examination committees (*overleg van voorzitters van examencommissies*) and the council for secretaries of examination committees (*overleg van secretarissen van examencommissies*).

8.1.5 Quality assurance committee

The exam policy of the department M&CS is characterized by the importance it has always placed on the quality assurance review by the Board of Examiners. Since 2006, the Examination Committee has a quality assurance subcommittee, which advises the Examination Committee with respect to the quality of final projects and exams. They provide feedback to the Examination Committee and the Program Directors.

Section 2.1(4) of the Examination Regulations for M&CS dictates the following in this respect:

“ The Examinations Committee shall also use course evaluations to investigate the quality of examinations. This regular form of evaluation shall be supplemented by further investigation based on random samples and possibly in response to other information (e.g. specific complaints). If necessary, the Examinations Committee will request the Program Director to take appropriate action. Activities shall be reported in the annual report. “

8.2 Departmental Board

The Departmental Board has a final responsibility for the quality of the assessments. Its duties are:¹⁵

- 1 To determine the profile of the Examination Committee and its members. In particular, it appoints Examination Committees that includes all relevant expertise. The board ensures that this committee can work independently.
- 2 To organize at least two meetings each year with the chairmen of the Examination Committees to discuss their annual report and their intentions. The educational management is also invited to attend these meetings.

¹⁵ See Department Regulations

9 Appendix 1: Measuring results: tools used to measure examination-related quality

Examination questions must be **valid**. Table 1 contains an overview of the tools that can be used when measuring the representativeness (content-validity) of exam questions. The table also shows departmental policy on these tools.

Table 1: Tools and policy relating to the measurement of the *content-validity* of exam questions.

Tool	By whom	Policy at M&CS
Before: The preparation of a test matrix.	Teacher	This tool is being used more and more, particularly by teachers that have completed a course on exam construction as part of their basic university teaching qualification (' BKO'). Is encouraged as an aid.
Before: Peer assessment	Verifying colleague	A review by at least one peer is compulsory
Before: Teach teachers how to construct exams	Teacher	Testing and assessment is part of UTQ
After: analysis of exam questions on the basis of exam results.	Teacher/ Exam expert/ Quality assurance employee	Central and departmental support can be obtained if necessitated by the results obtained.
After: Course evaluations, feedback from circle meetings, program committees, the GEWIS education advisor	Quality assurance employee, program committee, evaluation committee, students	The course surveys ensure that any complaints about representativeness come to the attention of the program and examination committees. These committees may ask Program Directors to put effective improvement measures in place. The Examination Committee receives complaints from students; these are dealt with by the Examination Committee itself or via Program Directors.

Transparency is an important starting point for examination-related quality. Transparency in the context of examination relates to the procedures and processes in place. These processes and procedures must be easily accessible to students. Students must be in a position to familiarize themselves properly with both. Table 2 provides an overview of the tools that can be used when measuring the quality of exam administration; policy on these tools is specified too.

Table 2: Tools for and policy on the measurement of exam *transparency*.

Tool	By whom	Policy at M&CS
Before: Compulsory exam instruction.	Teacher	Instructions for students and invigilators are provided on the cover sheet of each written final exam.
Before: Clarity is provided about grade composition in study guides.	Teacher	compulsory
Before: The quality of course descriptions and study guides is monitored	Program committee	The Program Committee (PC) monitors the quality of the course descriptions and corresponding study guides. It checks whether information is complete, amongst other things. Information about exams will be submitted to the Examination Committee and the Program Director.
Before: Practice exams are provided.	Teacher	In the Bachelor College, Week 8 of each quarter is reserved for exam preparation (teachers do not deliver any new education, but organize question hours and hand out practice exams, etc.). Agreements have been made with the GEWIS board for the collection of practice final exams and their availability to students. In the study guide, teachers look at practice questions and make the answers to at least one final exam available.
Before and during exam: information about fraud prevention policy	Teacher/ department	Information (on cover sheet, for example) about what is permitted and what is not.
After exam: inspection and option for second correction	Teacher/Student	Dates of inspection should be clear for the students. If the student doesn't agree with the teacher, he or she can ask for a second opinion.
After: Course evaluations, curriculum evaluations, feedback , success rates	Program committee, evaluation committee, quality assurance employee, students	Evaluations are discussed in the evaluation committees. Discussions also take place in the Program Committee and Exam Committee. The Examination Committee receives complaints from students; these are dealt with by the Examination Committee itself or via Program Directors.
After: After each exam period,	Real Estate	If necessary, the teacher in question will be

Program Directors and the Exam Committee will receive a report on any irregularities that occurred during exams (based on reports from invigilators).	Management	contacted via the Examination Committee or Program Directors.
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When grading exams, the question of **reliability** is particularly important.

Reliability is linked to the extent to which the exam represents a consistent measurement regardless of the object applicable. According to traditional test theory, the measurement-related correctness or reliability of an exam can be interpreted in two ways:

- 1) the extent to which conformity is achieved between assessors;
- 2) the extent to which the scores achieved are consistent for a repeated measurement involving the same assessor.

Table 3 provides an overview of the tools and policy that M&CS use to measure the reliability of exams.

Table 3: Tools and policy on the measurement of the exam *reliability*.

Tool	By whom	Policy at M&CS
Answer model	Teacher	Is encouraged via the basic university teaching qualification (BKO). Teachers can use this as an aid when developing their exams. The preparation of an answer model (correction regulations/model development) can be stipulated by the Program Director and/or Examination Committee.
Consultation between assessors	Teacher team	Where there are a number of assessors, the examiner will be responsible for ensuring the uniformity of assessment. He/she will achieve this by providing answer models that feature a sufficient amount of detail, on the basis of consultation between the assessors and/or by means of other suitable resources. When requested to do so, the teacher must be able to indicate how this uniformity is achieved.
Analyze exam	Teacher/Exam expert	Is encouraged via the basic university teaching qualification (BKO). Where prompted by results or evaluations, this tool can be brought into use at the request of the teacher, Program director or the Examination Committee.

10 Appendix 2: Roles and qualifications

Exam policy responsibilities			
Preconditions	Parties responsible	Harmonization/relationship with	Requirements
Composition of and appointments to examination committee	Dean	Program Director + Examination Committee	WHW, Section 7.12, 7.12a and 7.12b, and Departmental Regulations model, Article 2.10B and 2.11B
Appointment of examiners	Examination Committee	Program Director + Dean	WHW, Section 7.12c paragraph 1
Examination committee annual report	Examination Committee	Program Director + Dean	WHW, Section 7.12b paragraph 5, and Departmental Regulations model, Article 2.13B
Program and Examination Regulations program	Executive Board + Dean	Program Director + Dean + Program Committee	WHW, Section 7.13 and Section 7.14
University-wide exam policy	Executive Board + Dean	Program Director + Dean + AEB + ACB	TU/e exam policy framework
Program exam policy	Program Director	Examination Committee + Program Committee + Dean	TU/e exam policy framework
Examination regulations (assessment guidelines)	Examination Committee	Program Director + Program Committee + Dean	availability of Program and Examination Regulations + WHW, Section 7.12b paragraph 1b
Quality of examiners	Dean	Examination Committee + Program Director + Dean	TU/e exam policy framework
Safeguarding the quality of testing	Examination Committee	Program Director + Program Committee + Dean	Examination Regulations (WHW, Article 7.12b)
Teaching and examination process	Parties responsible	Harmonization/relationship with	Requirements
Program descriptors	Program Director	Examination Committee + Program Committee + Dean	Dublin descriptors or ACQA (legal)
			Accreditation (WHW, Section 5a.8, 5a.10a, 5a.13f and 5a.13g)
			WHW, Section 7.13 paragraph 2c
			Program and Examination Regulations

Program exam plan (learning trajectories/learning objectives based on descriptors)	Program Director	Examination Committee + Program Committee + Dean	TU/e exam policy framework
Learning objectives for each course	Program Director	Examiners + Examination Committee + Program Committee + Dean	
Making sample exams available	Examiner	Co-examiners + Examination Committee	
Exam matrix/exam schedule	Examiner	Co-examiners + Examination Committee	Exam policy and program exam plan
Exam + exam quality	Examiner	Co-examiners + Examination Committee	Examination regulations, at least: - Transparent - Valid - Reliable
Assessment procedures and model	Examiner	Co-examiners + Examination Committee	
Determining the pass mark	Examiner	Co-examiners + Examination Committee	Program and Examination Regulations, and Examination Regulations, at least: - Make clear in advance how pass mark is determined; - Opportunities for modifications later are clear; - How to deal with borderline cases.
Assessment	Examiner	Co-examiners + Examination Committee	Examination regulations
Exam analysis and evaluation	Examiner	Co-examiners + Examination Committee	
Organization of testing	Parties responsible	Harmonization/relationship with	Requirements
Registering for scheduled exams	Student	STU + Department + Dean	Program and Examination Regulations
Holding an exam	Student	STU + Department + Dean	Program and Examination Regulations
Scheduling of exams	Program Director	Examination Committee + Department	Examination regulations
Fraud and complaints	Parties responsible	Harmonization/relationship with	Requirements
Fraud and detection of plagiarism	Examiner	Examination Committee	Program and Examination Regulations and/or Examination regulations

			and TU/e fraud policy
Dealing with cases of fraud	Examination Committee	Examiner	WHW, Section 7.12b paragraph 2, procedure for cases of fraud that affect more than one department
Dealing with complaints in relation to exams	Examination Committee	Examiner and/or Examinations Appeals Board	WHW, Section 7.12b paragraph 3 and 4 Program and Examination Regulations
Exemptions and degree certificates	Parties responsible	Harmonization/relationship with	Requirements
Exemptions	Examination Committee	STU + Department	WHW, Section 7.12b paragraph 1d
Degree certificate	Examination Committee	STU + Department	WHW, Section 7.11
Module certificate	Examination Committee	STU + Department	WHW ...

11 Appendix 3: TU/e Examinations Committee Profile

Adopted by Executive Board on December 12th 2013

Purpose of the Examinations Committee

- The responsibilities of the Examinations Committee include safeguarding the quality of final examinations and assessment. The Examinations Committee fulfills this responsibility by:
- Safeguarding the quality of the final attainment level of the program.
- Ascertaining whether an examinee meets the conditions for obtaining a diploma.
- Identifying risks that threaten the quality of final examinations and assessment and making proposals to the competent authority for minimizing such risks.
- Monitoring developments within and outside the organization that can improve the quality of final examinations and assessment.

Position of the Examinations Committee within the organization

The Examinations Committee is an executive and advisory body of the Departmental Board which is authorized to ascertain whether a student meets the conditions stipulated in the Program and Examination Regulations (OER) with regard to the knowledge, understanding and skills necessary to obtain a degree and be awarded a diploma. The Departmental Board lays down the OER, according to which the Examinations Committee carries out its duties. The Examinations Committee is structured and works in such a way that guarantees it can operate in an independent and expert manner.

The Examinations Committee annually reports its findings on the quality of final examinations and assessment to the Departmental Board and other interested parties.

The Examinations Committee is ultimately responsible for the safeguarding of the quality of all examinations and assessments at interim and final level. The chair, vice-chair, members and secretary are appointed by the Departmental Board.

Composition of the Examinations Committee

The Examinations Committee comprises a chair, vice-chair, members and a secretary. The Examinations Committee can take advice from advisers.

Knowledge and skills of the Examinations Committee

Together, the Examinations Committee has the following knowledge and skills at its disposal:

The Examinations Committee has knowledge of:

- the legislation and regulations that apply to TU/e and the program
- the educational vision, teaching methods and final requirements of the program
- the quality of testing (testing expertise)
- the systems of assessment used within the program to ensure the quality of tests and examinations
- the system of examination and assessment at the interim and final level
- the management of the examinees' personal information and examination results
- the rules and procedures applied by the organization with regard to the awarding of diplomas and certificates
- the job profile of an examiner

- complaints procedures
- fraud prevention

The Examinations Committee is able to:

- determine whether the final examination (or all the individual exams combined) is/are representative of the final requirements for the program in terms of content and complexity and advise the Program Directors in this regard
- assess whether the final examination meets the criteria laid down in the relevant assessment system to ensure the quality of examinations
- establish and evaluate rules and procedures with regard to assessment at the interim and final level and suggest improvements
- provide advice in cases where competing considerations of quality and cost management need to be balanced
- evaluate the expertise and working method of those involved in final examinations and assessment and subsequently propose improvement measures and provide feedback to those involved
- provide accountability to ensure that the decision to award a diploma was/will be taken on justified grounds
- make decisions in the event of fraud, complaints, situations of force majeure, requests for exemption or alternative forms of assessment and other unforeseen circumstances relating to final examinations and assessment
- communicate and consult clearly and in detail with the management of the organization, the Educational Inspectorate, examinees and other stakeholders and parties involved
- communicate correctly, both orally and in writing, in Dutch and possibly also in another language if the duties require it
- prioritize, plan, execute and evaluate its work and propose improvements, as well as holding effective meetings.

Examinations Committee member profile

On the basis of their expertise and background, all Examination Committee members are expected to contribute to the shared knowledge and skills described above and must be capable of:

- operating as part of a team in an examinations committee
- modifying their own working methods in the light of changing educational visions, feedback, criticism, training and/or self-reflection
- arguing their own position and defending it as required
- observing confidentiality in dealing with examinees' personal details and issues relating to final examination and assessment
- adopting a constructive but critical approach to the parties involved
- operating independently and impartially with regard to management/directors, examiners and students

Chair and vice-chair of the Examinations Committee

Job description

The chair is ultimately responsible for ensuring that the Examinations Committee operates in an independent and expert manner and can be called to account in this regard.

The chair of the Examinations Committee:

- is accountable for and defends the policy and the decisions taken vis-à-vis internal and external parties
- signs the degree certificate
- advises the Dean on the appointment of Examinations Committee members on behalf of the Examinations Committee
- prepares meetings together with the secretary
- chairs Examinations Committee meetings
- compiles the annual report, including the annual plan

In his or her absence, the chair can be substituted by the vice-chair of the relevant committee. In that case, the latter will have the same duties and powers as the chair, but can only sign degree certificates with the words b.a. (p.p.), indicating that the chair is absent. In view of the need for external representation, it is preferred that the chair be a professor or associate professor. The chair is ultimately responsible for the decisions taken by the Examinations Committee.

Profile

The chair must have expertise with regard to the following:

- consulting at various administrative levels
- developing and formalizing implementation policy
- making decisions at the request of students and staff, in consultation with other committee members
- negotiating on settlements with students and other parties involved
- providing substantive leadership to the Examinations Committee
- focusing on quality
- conducting the defense in the Examination Appeals Board

The chair must also:

- display vision and strategic insight
- be skilled in consultative relationships
- be determined and decisive

Examinations Committee Secretary

Job description

The secretary is an administrative secretary and is not entitled to vote. The secretary supports the activities of the Examinations Committee. The work comprises the following:

- organizing and managing the secretariat, including archiving
- organizing Examinations Committee meetings, including support and minute-taking
- preparing and handling Examinations Committee decisions on requests and complaints from students and third parties

- handling correspondence
- providing secretarial support in appeals cases

Profile

The secretary has specific expertise in the following:

- communicating clearly and carefully in the Dutch and English languages, both orally and in writing
- (administrative) organization
- organization of meetings
- preparing and handling Examinations Committee decisions regarding requests and complaints from students and third parties and handling correspondence

The secretary must also:

- be a good listener and be able to distill essential information
- record agreements and decisions quickly and effectively
- be accurate and meticulous
- be able quickly to become conversant with all relevant information relating to the program and the associated OER