

# Ensuring the quality of examinations

Board of Examiners, Faculty of Industrial Design Engineering (IDE)

(August 2018)

## Introduction

In this document, the Board of Examiners explains how it carries out its statutory duty to ensure the quality of examinations and degree audits within IDE courses. In 2010, the Boards of Examiners were explicitly assigned these (already implicit responsibilities) duties, when a number of provisions was added to the Higher Education and Research Act (WHW)<sup>1</sup>.

The IDE Board of Examiners is a faculty committee that bears responsibility for the quality of examinations in IDE's Bachelor degree programme, and the Master degree programmes in Design for Interaction (Dfi), Integrated Product Design (IPD), and Strategic Product Design (SPD).

By having the additional duties assigned, IDE's Board of Examiners was prompted to set out its responsibilities in detailed procedures for monitoring, assessing, and reporting on the quality of examinations, and in the determination of any follow-up actions that are required.

In this document, the procedure of ensuring the quality of examinations within courses is described. The procedure to ensure the quality of the Master Final Projects is explained in a different document which is currently being finalised; the results of two pilots are evaluated and the final procedure is now being constructed.

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<sup>1</sup> These additional provisions are to be found in the law on strengthening the management of higher education (10 September 2010).

## Ensuring the quality of examinations in individual courses

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### 1. Starting points for ensuring the quality of examinations in individual courses

Drawing up a course examination<sup>2</sup> that meets the required standard is initially the responsibility of the relevant examiner, with the course coordinator or the core team (only in some courses of IDE's Bachelor degree programme) bearing final responsibility.

The Board of Examiners has a statutory duty to ensure the quality of examinations and degree audits. In order to be able to perform this duty effectively, it instructs each course coordinator to:

1. Have an examination matrix available for his/her course (additional information on the format is to be found in Chapter 3). The course-level examination matrix allows the Board of Examiners to get insight into the validity (in terms of content and definitions) of the examinations within the course, and the curriculum.
2. Devise all examinations (or parts of examinations) in collaboration with other teachers, however the course coordinator bears final responsibility for the examinations. By involving multiple teachers in the composition of each examination, there is a greater guarantee of valid and reliable questions/assignments, by which the quality of examination within the course as a whole is raised.
3. Draw up the examinations at the start of each course run, together with an assessment model in the shape of assessment criteria, and preferably with a scoring rubric, and cutting score. This enhances the transparency of the examination process, and strengthens the quality (validity and reliability) of the assessment and guidance processes (providing specific feedback).

Examinations are directly linked to the learning objectives of a course (the knowledge and skills that students should possess at the end of the course) and the way in which a course is taught (mode of instruction, teaching materials, and supervision). This is what is called the 'constructive alignment'.

The Board of Examiners looks at, and gives its opinion on, the *quality of examinations*; evaluation of the quality of teaching (e.g. content of learning objectives, final attainment levels, education policy) *is not part* of its responsibility. TU Delft's organisation is structured in such way, that the Director of Education (or Programme Manager) is responsible for the organisation, and the monitoring of the quality of the degree programmes. He or she, ensures that the degree programme and the teaching of it, meet the quality standard, manages and monitors the cohesion of the content of the curriculum, and determines the Faculty's education policy. At IDE, this is done by the Board of Education, which consists of the Director of

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<sup>2</sup> At IDE, examination is defined as those methods and activities used to systematically collect information about the degree to which a student has acquired the competences/learning objectives of a study component, with the aim of being able to give the student an assessment or mark. It is about both, formative and summative tests, which can have different shapes (examination, presentation, assignment, report etc.)

Education, the four programme coordinators, and a student member. This is in accordance with the Teaching and Examination Regulations<sup>3</sup>, as laid down by the dean of the faculty.

The new responsibilities (see introduction) have resulted in a more active role of the Board of Examiners regarding teaching, and examinations in particular. The Board of Examiners focuses on the link between the learning objectives of a course as laid down by the Board of Education on the one hand, and the course content and examinations set out by the course coordinator on the other.

The Board of Examiners considers it as a duty to report its findings on the quality of examinations to the Board of Education. In line with its responsibility, if necessary the Board of Education can take further action to alter or improve the quality of the degree programme, the examination policy and/or the deployment of staff (this is set out in greater detail in Chapter 5).

The Board of Examiners introduced its procedure for ensuring the quality of examinations at course level in 2014-2015, when a pilot was executed during which the procedure was further tuned. From 2015-2016, the (compulsory) courses of the four educational programmes of IDE regularly feature on the agenda of the Board of Examiners (see timetable in Chapter 7), where feedback on the quality of examinations is given. By applying the procedure, the Board of Examiners gains more detailed information with regard to the quality of examinations in courses, and at programme's level, and will be able to identify topics that will need further attention in future.

To give meaning to the starting points, the Board of Examiners asks each course coordinator to share information on the examinations in his/her course, and to provide examination materials. A further elaboration on this is to be found in the next chapter, Chapter 2.

## 2. Provision of relevant materials to the Board of Examiners

Within a few weeks after the start of a course run, the course coordinator of a for assessment evaluation scheduled course, will receive a request to provide the Board of Examiners with the following materials after the course has finished:

- the completed examination matrix of the course (format provided by the Board of Examiners);
- a copy of each summative and formative test (exam, instruction, assignment...);
- two examples of student work, with diverse results (high and low grade) of each summative test;
- answer model(s) and/or scoring rubrics of these tests (including those completed for the examples provided);
- an explanation/description of the structure of the course (e.g. the course manual).

The materials are preferably handed in digitally with the Board of Examiners' assistant for testing assessment, by sending these to: [educationregulations-ide@tudelft.nl](mailto:educationregulations-ide@tudelft.nl), or by handing in a separate data carrier containing the requested files.

Next to the supplied materials, the Board of Examiners will take notice of the most recent course evaluation report, and of the latest course run's pass rate figures.

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<sup>3</sup> The Teaching and Examination Regulations are set down for each degree programme every year.

### 3. Examination matrix at course level

The Board of Examiners expects course coordinators to have an examination matrix available for their course, which is a key component in the assessment framework that the Board of Examiners applies to assess the quality of examinations. The examination matrix format that the Board of Examiners expects course coordinators to complete, is based on Bloom's taxonomy<sup>4</sup>, a taxonomy that is widely used in higher education. Below the format is shown, with an example.

Table 1. Examination matrix with example (in blue)

<b>A. Course name and code: ...</b>							
<b>B. Description of both, formative and summative assessment parts (please, mark formative parts with *):</b> Exam <sup>5</sup> 1: <i>Written test (individual, at the end of the course)</i> Exam 2: <i>Assignment 1; group of 3 students (report)</i> Exam 3: <i>Assignment 2; group of 5 students (report + final presentation)</i>							
<b>C. Exam is devised by:</b> Exam 1: <i>Teacher A, B and C</i> Exam 2: <i>Teacher B and C</i> Exam 3: <i>Teacher A, B and C</i>				<b>D. Exam is assessed by:</b> Exam 1: <i>Teacher A, B and C</i> Exam 2: <i>Teacher B and C</i> Exam 3: <i>Teacher A, B and C</i>			
<b>E. Matrix</b>	<b>Remember</b>	<b>Understand</b>	<b>Apply</b>	<b>Analyse</b>	<b>Synthesise</b>	<b>Evaluate</b>	
1. <i>Learning objective 1</i>		<i>Final test (exam 1)</i>		<i>Assignment 1 (exam 2)</i>			
2. <i>Learning objective 2</i>			<i>Final test (exam 1)</i>	<i>Assignment 1 (exam 2)</i>			
3. <i>learning objective 3</i>					<i>Assignment 2 (exam 3)</i>		
4. <i>etc.</i>							
<b>F. Brief outline of actions to prevent fraud (like free-riding by students):</b> <i>- Different group composition for assignment 1 and 2</i> <i>- Reports of Assignments 1 and 2 are checked with the 'Safe assign' tool</i> <i>- For Assignment 2 the Scorion tool is used</i> <i>- Final test according to IDE rules and regulations for written test (under surveillance)</i>							
<b>G. Brief outline of actions to ensure consistent assessment by various teachers/coaches:</b> <i>- Reports of assignment 1 and 2 are assessed by teacher duos</i> <i>- The final presentations are assessed by a teacher duo from another studio</i> <i>- A meeting with all teachers is organised to tune given grades between studios</i>							
<b>H. Brief outline of determining the final mark (including weighing of components and fail/pass regulations):</b> <i>- The final test and assignment 1 each account for 30% in the final mark, and assignment 2 accounts for 40%. When an assignment is handed in too late, the final grade will be deducted by one point.</i>							

<sup>4</sup> Bloom's original taxonomy dates from 1956. Since then, various attempts have been made to revise the work, of which not all have been underpinned by empirical research. The actual teaching at IDE and the OC Focus modules for teachers/UTQ programme, feature different variations of Blooms' taxonomy. For example, the 'synthesis' category is sometimes replaced by 'create', and occupies the 'evaluate' position. A framework is required to enable assessing the way in which examination in a course is related to its learning objectives, and to enable mutual communication on the matter between lecturers and the Board of Examiners. For pragmatic reasons, the IDE Board of Examiners decided to use Bloom's original taxonomy as the assessment framework. Discussions on 'which taxonomy' to apply, and 'which is the correct version', are expected to be avoided in this way.

<sup>5</sup> The word 'Exam' here, is supposed to cover anything that contributes to assessment (of students) in the course, including tests, instructions, assignments, etc...

## Guidelines for filling out the matrix format

Below is a *point-by-point* explanation of the various aspects of the examination matrix, indicated with capitals in the matrix format.

### A., B., C., and D.

At A. factual information is required: the *name and code of the course* should be filled in, followed by a *list of assessment parts* that are used in the course (B.), and which can be both formative and summative examinations (mark formative examinations).

At C., and D. fill in the *names of the teachers* who were involved in devising the examinations, and *the names* of those who were involved in assessing these.

### E-1.

Enter the course's *learning objectives* (LO's) in the 1<sup>st</sup> column (description of what a student should be able to after successfully completing the course). Use the LO's as formulated in Course Base. Each LO should be entered in a separate, numbered cell.

On the horizontal axis, the various levels of the cognitive processes are shown to an increasing degree of complexity. In other words, the levels of cognitive complexity are ranked; a continuum from *concrete* to *abstract*. For example; a student is only able to analyse, if the required subject material is understood and the student is able to apply it. In principle, **the way in which a learning objective is formulated prescribes the proficiency level on which it should be examined**, bearing in mind that a *higher level of proficiency implies that the lower levels are already covered* (see Bloom's taxonomy).

The table below includes additional information on the six levels of the cognitive process.

<i>Types of objectives</i>	<i>Explanation</i>	<i>Operationalisation (examples of verbs)</i>
<b>Remember</b>	Reproduce facts	categorise, describe, distinguish, recall, rephrase, ...
<b>Understand</b>	Comprehend, interpret	characterize, illustrate, explain, ...
<b>Apply*</b>	To apply knowledge and insights (the former categories) into new situations	deal with, calculate, use, choose and follow a procedure, translate, ...
	<i>*Given the content of the programmes, competence of the learning objectives is often demonstrated by students in a report or oral presentation. In the case that 'communication' is the focus of the learning objective, it is important to determine whether the focus is on communicating the content (applying), or the content itself. If the latter is the case, often a higher cognitive process is at stake (analyse, synthesise or evaluate). The learning objective should be categorised on the corresponding cognitive process of the examination matrix.</i>	
<b>Analyse</b>	Tackle a (complex) situation with knowledge and insights, divide it into sub-parts, reduce problems to a pattern or underlying problem	argue, examine, compare, discuss, (re)define, verify,...
<b>Synthesise</b>	Combine parts into a coherent and functional whole	build, compose, design, make, model, solve, suggest ...
<b>Evaluate*</b>	Make judgements based on criteria and standards	advise, appraise, decide, comment upon, evaluate, test, value, ...
	<i>*This cognitive process is <u>not</u> about (self) reflection. Since self-reflection is a form of meta-cognitive knowledge, and can be applicable to any level of the cognitive process. For example, after performing a calculation (applying), a student can conclude to use another method from now on. To be able to evaluate as meant in Bloom's taxonomy, is to be able to <u>make judgements</u> based on criteria and standards.</i>	

Table 1. Explanation of Blooms Taxonomy

**E-2.**

Next, state *for each learning objective* what *examination method* is used or in which exam the LO is being assessed, also indicate *the level of cognitive process* the LO is being assessed on. If possible, enter the weight of the (summative) examination in the final mark.

**F.**

State briefly what measures are taken to prevent fraud. Fraud is e.g. cheating during an examination, free-riding on the work of others during group assignments, improper use of someone else's ideas, or committing plagiarism when writing reports.

**G.**

State what activities are organised during the course, to ensure consistency in assessment by different teachers/coaches.

**H.**

State how the final mark for the course is determined. Include the weighing factors for the different components, as well as any bonus-malus arrangements. Indicate the pass/fail rules, and whether students are allowed to improve a grade and if so, how.

**4. The Board of Examiners' check points when assessing examination quality**

The following aspects of the material provided are evaluated by the Board of Examiners:

Check 1	Is each learning objective examined in the course? (Consistency of Course Base description with examination matrix and examinations)
Check 2	Do the levels of proficiency (cognitive process) on which is examined correspond with the way in which the learning objectives are formulated? (Consistency of completed examination matrix with Bloom's taxonomy and the examinations)
Check 3	Does the method of the examinations correspond with the indicated learning objectives/levels of proficiency? (Consistency of the examinations/course manual with completed examination matrix)
Check 4	Does the weighing assigned to the learning objectives correspond with the related learning activities/examination methods? (See examination matrix and course evaluations/pass rates)
Check 5	Are the assessment criteria, and the way in which (partial) grades are determined for each examination clear and fit for purpose? (See the answer models/assessment forms/scoring rubrics that are provided)
Check 6	Has the examination been constructed by more than one teacher? If this is not the case, is there a proper explanation for this? (See provided information on the examination matrix)
Check 7	Are adequate measures been taken to prevent students from committing fraud during examinations of the course? (See provided information on the examination matrix)
Check 8	Have adequate measures been taken within the course to ensure consistency in the assessment by different teachers/coaches? (See the additional information on the examination matrix)

The Board of Examiners prepares written feedback on its findings for the course coordinator. In *Appendix A* the feedback form used by the Board of Examiners is to be found.

Table 3. Overview of feedback by Board of Examiners about quality of examination

*The feedback by the Board of Examiners in reference to the quality of examination is defined as:*

1. **Take action**, to secure the quality of the examination of the course;
2. **Consider action**, or ways to further improve and ensure the examination of the course;
3. **To continue** the way of working, because it is part of thorough examination

*The defined feedback is further explained on the form.*

The course coordinator is asked to respond to the findings of the Board of Examiners, and to provide any additional information, before the feedback will be established as being final (see also the next section).

## 5. How the Board of Examiners operates

The Board of Examiners' assistant for testing assessment has a key role in the contact with the course coordinators, in collecting the requested examination materials, and in preparing the assessment procedure for the appointed members of the Board of Examiners. The appointed members of the Board of Examiners examine the materials in small teams, and prepare preliminary feedback on the perceived quality of the examinations as input for discussion with the full Board of Examiners.

When having discussed the preliminary feedback in a meeting of the full Board, the assessment will be set down as concept feedback, and as such be provided to the course coordinator.

The working methods and responsibilities are set out in more detail below, ordered according to the tasks of the full Board of Examiners, and the Board's assistant for testing assessment.

### Ensuring the quality of examination of individual courses; duties and responsibilities

#### A. Of the assistant for testing assessment:

1. Preparing annual planning, and allocation of courses to be checked among the members of the Board of Examiners (\*). Submitting the annual planning to the Board of Education for approval.
2. Inviting the course coordinators by e-mail, and offering the possibility to make an appointment for any additional information concerning the procedure and the information that is requested.
3. Responsible for collecting the requested examination materials from course coordinators, for collecting the Course Base description, the most recent course evaluation results, and the pass rate figures of the most recent course run (obtained from Osiris), for the course in question. Preparing the assessment, and providing the information package to the appointed members of the full Board of Examiners.<sup>6</sup>
4. Preparing concept feedback based on the discussed preliminary feedback, as set down in the full Board of Examiners meeting. (see also Table 4)
5. Provide concept feedback to the course coordinator, and ask for a written response to that feedback and the indicated considerations and actions, to be received within a few weeks. The course coordinator is also given the opportunity to make an appointment in order to have the concept feedback further explained.
6. Collecting the written response of the course coordinator, and provide this response to the members of the full Board of Examiners to have it discussed in a full Board's meeting.

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<sup>6</sup> If necessary, obtaining information from the course coordinator that was not provided/is missing, to enable a thorough evaluation and drawing up of feedback. If the available information is insufficient to provide decent feedback, the course will be rescheduled to the following year.

7. After discussing the written response of the course coordinator;
  - setting down the final feedback; correcting factual inaccuracies, and adding the response to the initial concept feedback, or
  - invite the course coordinator for a meeting, in which the feedback of the Board and the course coordinator's response both can be further elaborated on, after which final feedback will be drawn up.
8. Providing the final feedback to the course coordinator.
9. Informing the Board of Education on the established final feedback. The purpose of this is to set down the feedback, and to enable the Board of Education to take action if necessary; prioritising the actions to be taken, and facilitating its implementation by the course coordinators.
10. Publishing the annual planning on the Assuring of examination quality webpage, and in due time also publish general findings with regard to the quality of examinations at programme level on the website.
11. If applicable, returning the examination materials to the course coordinator.
12. Archiving the completed examination matrix and the final feedback form.

**B. Of the members of the full Board of Examiners:**

1. Confidential handling of the examination materials provided by the course coordinator, and of the feedback forms completed by the Board of Examiners. The materials are only used for evaluation purposes by the Board of Examiners, and its advisors/support staff, and for providing feedback to the Board of Education; they are not made available to third parties<sup>7</sup>.
2. Preparing provisional feedback on the perceived quality of the examination in courses assigned to the Board's member teams (based on the course materials provided by the assistant for testing assessment, and completed on the standardised feedback form).
3. In clear terms, writing down information, feedback, actions to be taken, considerations, and aspects to be continued with, on the feedback form, for the purpose of making it easy to understand for the course coordinator and the Board of Education.
4. Drawing up points for discussion/of attention in preparation for setting down the assessment as concept feedback in a full Board of Examiners meeting.(\*\*)
5. When required, participate in a meeting scheduled with a course coordinator to further elaborate on the feedback drawn up.

(*)	Conditions for allocating courses to be evaluated to the members of the Board: <ul style="list-style-type: none"><li>- Members of the Board of Examiners do not assess the examinations in their own course(s)</li><li>- Examinations are assessed by a team of Board members from which at least one member is not involved in the course, or in the learning path, to assure the examinations are always evaluated by at least one 'outsider'.</li></ul>
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(**)	When many points of action are proposed in the feedback, the course in question will again be selected for assessment evaluation the following year. In the planning, there will be room left to anticipate on specific requests of course coordinators, the Board of Education or the educational advisor.
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<sup>7</sup> An exemption to this rule has to be made in the situation of Accreditation and Programme Assessment. When the assessment panel needs to get insight into IDE's quality assurance procedures, the assessment of examination quality materials together with the final feedback forms will be made accessible to the panel members.

The evaluation on quality of examinations of a course, and establishing the feedback is set up in three clear steps:

1. **Preliminary feedback:** drawn up by teams of two or more members of the Board of Examiners. The team prepares preliminary feedback for discussion in the full Board;
2. **Concept feedback:** as a result of discussing the preliminary feedback in a full Board meeting, the feedback will be processed to concept feedback, and sent to the course coordinator who is asked for a response;
3. **Final feedback :** a combination of the concept feedback, and the written response of the course coordinator.

## 6. After providing final feedback to the course coordinator; follow-up

The Board of Examiners submits its findings on the quality of examinations within a course to the Board of Education after the final feedback was sent to the course coordinator. The Board of Education receives the final feedback form together with a summary of findings of the Board. Annually, or after a significant number of courses within a programme have been evaluated, findings are summarised on the level of the programme. The Board of Examiners will draw up recommendations for requested actions from the Board of Education to take, in order to further strengthen the quality of examinations. The Board of Education in turn, will give its response and sets out how it will deal with the recommended actions.

## 7. Considerations in course planning

The Board of Examiners draws up a planning for quality assessment of examinations, and submits it to the Board of Education to inform them, and to receive feedback on the proposal. The Master Final Project has its own quality cycle and does not feature in this planning. In principle, every course will be addressed once every four years, with reservation of programme changes.

When courses are new in the programme, or important changes (e.g. in course organisation) were implemented recently, the planning might change. Next to that, the Board of Examiners wants to comply with special requests from e.g. the Educational Board (\*\*).

A course will be checked more often than in the regular cycle if:

- there have been significant changes to the examination methods;
- many points of action were formulated during previous checks;
- a reasoned request to that was made to the Board of Examiners, by a teacher, a course coordinator, the Board of Education, the educational advisor or an employee/student representative body.

## Appendix A

### Standardised assessment quality feedback form – IDE Board of Examiners

Course code / course name:	
Course coordinator:	
Course offered in:	20xx – 20xx, quarter x
On behalf of the Board:	Date

#### A. Summary of preliminary feedback assessment quality – Board of Examiners IDE

Briefly summarised, in the opinion of the Board of Examiners...

#### B. Feedback on checks, explanation, and formulated actions

Feedback is formulated as: *take action*, *consider action*, and *continue* way of working

Check on:	Feedback:	Explanation:
1- Are all learning objectives examined within the course? (Consistency Course Base description with examination matrix and examinations.)		
2- Do the levels of proficiency on which LO's are examined correspond with the formulation of the learning objectives? (Consistency examination matrix with Bloom's taxonomy and examinations.)		
3- Do the examinations correspond, content wise, with the filled out learning objectives/levels of proficiency? (Consistency provided examinations/course manual/syllabus with examination matrix.)		
4- Does the weight that is assigned to a learning objective correspond with the associated learning activity(ies)/way(s) of examination? (See examination matrix and course evaluations/success rates.)		
5- Are the assessment criteria and formation of the (partial) grades clear and adequate for every examination? (See provided answer model/assessment forms/rubrics.)		
6- Is the examination constructed by more than one teacher (See filled out clarification on the examination matrix.)		
7- Have adequate measures been taken to prevent students from practising fraud within the examinations in the course? (See filled out clarification on the examination matrix.)		
8- Are adequate activities organised		

within the course to assure consistency in assessment by different teachers/coaches? (See filled out clarification on the examination matrix.)		
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**C. Formulated actions:**

The Board of Examiners deems to **take action** necessary on the following points – to assure the quality of assessment:

1.

The Board of Examiners asks to **consider action** on the following points – to further improve the quality of examination:

1.

The Board of Examiners advises to **continue** the following points – as these demonstrate a solid examination:

1.

**D. Reaction course coordinator:**