ENGD STUDY GUIDE 2024-2025

March 20, 2024

UNIVERSITY OF TWENTE.

INTRODUCTION

Welcome to our comprehensive study guide for the five Engineering Doctorate (EngD) programs available at the University of Twente: Business & IT, Maintenance, Energy & Process Technology, Civil Engineering, and Robotics. Whether you're a candidate or a supervisor, this guide is here to support you every step of the way throughout your EngD journey. Inside, you'll find valuable information on program organization, regulations, educational structure, project requirements, milestones, and important contacts. Our goal is to make your academic journey as smooth as possible, so dive in and let us guide you through!

Dr. Hans Voordijk

EngD-coordinator

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DEFINITION OF TERMS

4TU.SAI	Stan Ackermans Institute (its members are Delft University of Technology, Eindhoven University of Technology, University of Twente and Wageningen University & Research)
BIT	Business Information Technology EngD programme
BoE	EngD Board of Examiners
BMS	Faculty of Behavioural, Management and Social Sciences
CANVAS	Learning Management System (LMS) used to organise and support education
CCTO	Dutch Certification Committee for Technological Design Programme ('Nederlandse Certificatie Commissie voor Opleidingen tot Technologisch Ontwerper, CCTO')
CE	Civil Engineering EngD programme
Coursefinder	Course platform listing PhD/EngD generic courses
CTD	Centre for Training and Development
EEMCS	Faculty of Electrical Engineering, Mathematics and Computer Science
EngD	Engineering Doctorate
EngD Charter	Regulations for the EngD programme that results in a Engineering Doctorate Degree. In Dutch 'Statuut voor EngD-kandidaten'
EPT	Energy, Process and Technology EngD programme
ET	Faculty of Engineering Technology
ILO	Intended learning outcome
ITC	Faculty of Geo-Information Science and Earth Observation
M	Maintenance EngD programme
OSIRIS	Course platform listing MSc and EngD disciplinary courses
PhD	Doctor of Philosophy
ROB	Robotics EngD programme
S&T	Faculty of Science and Technology
TGS	Twente Graduate School
T&SP	Training and Supervision Plan
UT	University of Twente

1 INTRODUCTION

1.1 TWO-YEAR ENGD PROGRAMMES AT THE 4TU.SAI (STAN ACKERMANS INSTITUTE)

4TU.SAI, a collaboration of four Dutch universities of technology (Delft, Eindhoven, Twente, and Wageningen), offers two-year EngD programmes focusing on technological design. These post-master programmes enhance both technological expertise and professional skills, boosting career opportunities for EngD-candidates. Graduates enjoy excellent job prospects, thanks to our programme's reputation. Explore more at www.4tu.nl/sai/en/.

The University of Twente currently offers five EngD degree programmes on: Business &IT, Civil Engineering, Energy Process & Technology, Maintenance and Robotics.

1.2 ENGD DIPLOMA AND DEGREE

Upon EngD programme completion, graduates receive a certified diploma and the academic degree of Engineering Doctorate (EngD). EngD graduates are registered as technological designers in the Dutch register maintained by the Royal Institute of Engineers (KIVI). Programme quality is ensured through assessment and certification by the Dutch Certification Committee for Technological Design Programmes ('Nederlandse Certificatie Commissie voor Opleidingen tot Technologisch Ontwerper, CCTO)[1]

2 PROGRAMME ORGANIZATION

2.1 FACULTY PROGRAMME ORGANIZATION

Coordination and organization of the Civil Engineering, Robotics, Maintenance and Energy & Process Technology programmes is accommodated at the Faculty of Engineering Technology (ET) whilst the Business & IT programme is accommodated at the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS).

2.2 TWENTE GRADUATE SCHOOL (TGS)

The post-master EngD programme at the University of Twente is part of the Twente Graduate School (TGS), the university unit which registers doctoral research, teaching and supervision for EngD-candidates, monitors progress and quality, gives administrative support at registration and defence of the dissertation, and organises the graduation ceremony. The TGS is led by the Dean TGS who is accountable to the Doctorate Board.

[1] CCTO is the certification instance at the moment. It is possible that in the future, another (international) organization will be involved in the certification or accreditation of the EngD title.

2.3 SUPERVISORY TEAM

The Faculty Dean is responsible for the approval of the project plan, including the supervisory team and the budget.

The supervisory team must consist of a minimum of two and a maximum of three supervisors, including at least one Scientific Supervisor with the right to confer a doctorate (*ius promovendi*) and at least one Design Supervisor responsible for the daily guidance of the EngD-candidate. Both the Scientific Supervisor and the Design Supervisor are affiliated to the University of Twente. Additionally, one External Supervisor on behalf of the client may be appointed. Please refer to Article 3.5 of the EngD Charter for more information.

The supervisory team ensures that EngD-candidates meet the Intended Learning Outcomes of the programme and thesis acceptance requirements. Periodic meetings should take place between the candidate and the supervisory team. The frequency of these periodic meetings is determined by mutual agreement between the candidate and the supervisory team and must be recorded in the Training and Supervision Plan (Appendix 2.1). A frequency of at least once every two weeks is recommended. Refer to Article 3.6 of the EngD Charter (i.e. Statuut voor EngD-kandidaten) for more information.

2.4 ENGD BOARD OF EXAMINERS

The University of Twente established an EngD Board of Examiners (BoE), operating under the mandate of the Doctorate Board. The BoE acts as an independent authority.

For detailed information on the EngD BoE's tasks and methods, refer to Article 4.2 of the EngD Charter. The BoE includes the Chair (Dean TGS), Vice Chair (EngD-coordinator), Programme Directors and the Secretary (EngD Support Officer TGS).

2.5 USEFUL LINKS AND CONTACTS AT THE UNIVERSITY

Appendix 1 provides a list of useful links. Programme-specific contact information can be found in the Appendices (Business & IT, Robotics, Maintenance, Civil Engineering and Energy & Process Technology).

2.6 SCIENTIFIC INTEGRITY

For information on scientific integrity-related issues, refer to Article 1.4 of the EngD Charter.

3 REGULATIONS

3.1 ENGD CHARTER

The EngD programmes at the University of Twente adhere to rules outlined in the EngD Charter, adopted by the Doctorate Board. The EngD Charter delineates the roles and expectations for EngD-candidates and their supervisors. We therefore strongly advise thorough reading of the EngD-Charter by both candidates and supervisors. Some information from the Charter is also found in this study guide, with the EngD-Charter taking precedence in case of contradictions.

3.2 ENGD MONITORING SYSTEM

After being accepted by the Faculty Dean, EngD-candidates are enrolled in the EngD monitoring system. This system oversees the EngD programme by formalizing and archiving crucial interactions among e.g. candidates, supervisors and

Deans. It exclusively handles formal processes outlined in the EngD Charter. Users receive guidance via emails or can access the Dashboard of the EngD monitoring system with their 'm-number' credentials. The EngD monitoring system sends alerts for upcoming tasks.

4 PROGRAMME GOALS

4.1 TECHNOLOGICAL DESIGN

EngD-candidates are required to contribute to society through the creation of technological designs, aligning with the American Engineering Council of Professional Development's definition of engineering. This involves creatively applying scientific principles to develop various artefacts such as products, structures, processes, transport systems, control systems, and instruments. These artefacts serve economic or societal purposes and are designed systematically and evaluated using scientific analysis methods. The EngD programme focuses on the technological design of artefacts, which can range from complete entities to components or redesigns, also processes and methods. Each project emphasizes different design phases, including requirements, modeling, development, evaluation and validation.

4.2 INTENDED LEARNING OUTCOMES (ILO)

The EngD programme targets individuals capable of creating high-quality, innovative designs to solve complex, multidisciplinary challenges. Upon completion, EngD-candidates should be able to: 1) independently design multidisciplinary artefacts, 2) contribute to comprehensive designs either independently or collaboratively, and 3) execute the project independently to accomplish the design.

The programme's learning outcomes encompass 1) disciplinary design skills, 2) disciplinary technical knowledge, 3) reporting and presentation skills and 4) professional (transferable) skills.

An important difference in the final attainment level between a MSc and an EngD graduate is that the latter is educated to create technologically advanced designs, tackling higher complexity and stronger multidisciplinary challenges. EngD graduates possess a broader skill set, including creative thinking, design methodologies, and communication skills. Refer to Article 3.3 of the EngD Charter for the detailed ILO list (i.e. end qualifications) and to Appendix 3 for the competence level guide.

5 EDUCATIONAL PROGRAMME

The EngD trajectory comprises three parallel blocks in its third-phase programme: (1) professional development courses and activities, (2) disciplinary courses and activities, and (3) the technological design project. The education goal is to achieve the Intended Learning Outcomes outlined in Article 3.3 of the EngD Charter. Skills acquired in professional development and knowledge from disciplinary courses are directly applied in the design project. Some professional development courses may also be taken to support the candidate's future career. In principle, an EngD-candidate will follow post-master level courses. Post-master level courses are defined as those which are either:

- an EngD course,
- a PhD course or,

- an MSc course accompanied by an EngD upgrade assignment. Following an MSc course without an upgrade assignment is justified if the EngD candidate needs to broaden knowledge beyond their field of expertise.

5.1 EUROPEAN CREDITS

The EngD programme has a nominal duration of 24 months and requires a minimum course load of 48 ECTS. The average study load per EC is 28 hours.

5.2 TRAINING AND SUPERVISION PLAN (T&SP)

In the first 3 months, EngD-candidates must submit a T&SP education plan using the EngD monitoring system, developed in consultation with supervisors. Refer to Article 3.6 of the EngD Charter for more information. The T&SP lists the knowledge and skills to be acquired, the design project, the supervisor names, the supervision details and a data management plan (if applicable). It is uploaded into the EngD monitoring system by the EngD-candidate and approved by the Scientific Supervisor. This document can be adjusted during the EngD trajectory; revised versions will require formal approval from the Scientific Supervisor. Refer to Appendix 2.1 for the T&SP template.

Upon successfully completing each educational activity, candidates list each activity and upload completion evidence in the EngD monitoring system. Section 7.2 provides a list of the documents to be used as completion evidence per type of activity.

5.3 ENGD EDUCATIONAL PROGRAMME STRUCTURE AND REGISTRATION

A minimum of 48 ECTS credits in educational activities are required. Structurally, activities are categorized as mandatory, elective, or self-regulated.

Below we describe the courses and activities which can be included in the tailor-made EngD educational programme, the workload in credits and their related Intended Learning Outcome (ILO). For the list of ILOs, refer to Article 3.3 of the EngD Charter.

5.3.1 European Credit (EC) qualifying courses and other activities

Table 1: Mandatory courses (all on post-master level, 22.5 EC)

Activity	Type	Total ECs	ILO # (refer to EngD Charter)	Additional notes
Systems Design and Engineering for EngD course (SDE)	Disciplinary	12.0	ILO 1 to 7	**PREFERABLY DONE IN YEAR 1.** OSIRIS course code 202400595.
One programme-specific course	Disciplinary	6.0	To choose from ILO 1 to 7 depending on current knowledge and skills of EngD-candidate.	See course name per programme in Appendix 6. The candidate together with the Scientific Supervisor could choose a different mandatory course if the listed one(s) is(are) deemed unsuitable for the design project.
TGS PhD/EngD introductory workshop	Professional development	1.5	ILO 11, 13	**PREFERABLY DONE IN YEAR 1.** This workshop includes the academic integrity

Activity	Type	Total ECs	ILO # (refer to EngD Charter)	Additional notes
				course. Information and registration is available here.
Data management course (if applicable)	Professional development	1.0	ILO 11	To be done once data to be used is agreed upon. Information and registration is available here. If the design project involves no data, this should be noted down in the T&SP. Subsequently, the candidate and the Scientific Supervisor will identify a relevant replacement professional development course.
Professional effectiveness course	Professional development	2.0	ILO 11 - 12	Composed of the following 4 online courses (1 EC, 28 hours): • Networking for researchers, • Introduction to collaboration, • Participating in a collaboration and, • Advancing your scientific presentations. In addition, this UT course should be also followed (1 EC, 28 hours): • Time management.

Table 2: Elective courses

Activity	Type	Max. ECs	ILO # (refer to EngD Charter)	Additional notes
Additional professional development courses	Professional development	-	ILO 2, 6, ILO 8 to 10, and ILO 12	e.g. Career prospects for young professionals, Career orientation and application, Consortium dynamics, Creative and design thinking, Entrepreneurial researcher, Science communication, Science writing, Systematic literature review, Taste of teaching, Visual storytelling.
Additional disciplinary courses	Disciplinary	-	To choose from ILO 1 thru 7 depending on current knowledge and skills of EngD-candidate.	Choose at least one in consultation with the Scientific Supervisor. See list of popular elective courses per programme in Appendix 6.
Summer/winter school, research school courses, in-company courses, courses at 4TU and other universities	Disciplinary	-	To choose from ILO 1-7 depending on current knowledge and skills of EngD-candidate.	
Language courses	Professional development	3.5	ILO 8-10, and ILO 11-12	

Table 3: Self-regulated courses and activities

Activity	Type	Maximum ECs	ILO # (refer to EngD Charter)	Additional notes
Capita Selecta	Disciplinary	12.0	To choose from ILO 1-7 depending on current knowledge and skills of EngD-candidate.	See requirements on Section 5.3.4
Supervision of BSc/MSc student work or teaching assistance in BSc/MSc courses	Professional development	5.0	ILO 10, and ILO 11-12	The Taste of Teaching course (2.0 EC) should be followed unless the work involves being a lab assistant. Refer to Article 3.4 of the EngD Charter. Marking exams is not part of the education programme; therefore ECs can't be claimed for that.
Conference papers, posters and presentations	Disciplinary	3.0	ILO 9-10	
Presentations at research group seminars	Disciplinary	1.0	ILO 9-10	
Peer-review for a conference or journal	Professional development	2.0	ILO 8	
EngD representative and/or PNUT board member	Professional development	2.0	ILO 12	
Research event organization (conference, seminars)	Professional development	2.0	ILO 12, 13	

5.3.2 Registration for UT courses

Registration for UT disciplinary courses is done in OSIRIS using the student number (s-number). The EngD-candidate should register for the course exams separately. Registration for the professional development courses is done in the Coursefinder using the employee number (m-number).

Courses require a minimum grade of 6 or a pass/fail verdict. Disciplinary master courses end with a post-master upgrade assignment (see Section 5.3.3).

All courses must be completed within the programme's nominal duration. If an EngD-candidate fails to complete a course and meanwhile, the course's content or assessment method changed, they must re-enroll and complete the new course.

5.3.3 Scenarios involving disciplinary master course upgrade assignments

1) If during their MSc programme at UT, an EngD-candidate took a course which is mandatory under the EngD programme, they will only do the upgrade assignment and receive a maximum of 2.5 ECs.
2) An EngD-candidate who never followed a given mandatory course during their MSc programme follows that course, submits the upgrade assignment and receives a maximum of 6.0 ECs.

3) An EngD-candidate may wish to broaden their knowledge by taking a master course without an upgrade assignment. In this case, the EngD-candidate receives the standard ECs granted for the master course. This is only possible if the candidate lacks any knowledge on the topic of the course. A maximum of one master course without an upgrade assignment is allowed.

5.3.4 Capita Selecta

Capita Selecta courses are customized educational activities in the form of post-master level tailored assignments or supervised self-study. The content, amount of work, and the form of the *Capita Selecta* must be set up in agreement with the supervisory team.

A maximum of two *Capita Selecta* courses can be taken during the programme, for a maximum of 12 EC. The programme-specific codes needed for registering the successful completion of *Capita Selectas* in OSIRIS are listed in Appendix 6.

Note that the state-of-the-art or literature review is part of the project, not part of the educational programme. Therefore, ECs can't be claim for that.

5.3.5 Financial aspects

The university covers costs for disciplinary activities at UT. Approval from the Scientific Supervisor for attendance of activities which involve costs is required.

5.3.6 Exemptions

Exemptions for parts of the educational program, for example on the basis of previously acquired competencies, can be submitted by the Scientific Supervisor to the Dean TGS (exemptions-tgs@utwente.nl), who will decide on this (if necessary after consultation with the Programme Director and Faculty Dean). Exemptions above 20EC are submitted to the Doctorate Board (doctorateboard@utwente.nl) for approval.

6 TECHNOLOGICAL DESIGN PROJECT

The design project is defined in consultation with the client organization. The project should be innovative, complex, sufficiently multidisciplinary and should contain sufficient design challenges. The EngD-candidate typically works together with colleagues. The design project should have a workload of at least 60 EC.

6.1 DESIGN PROCESS

The design project constitutes a significant portion (at least 50%) of the EngD programme, serving not only to address engineering challenges, but also to demonstrate the achievement of learning objectives within an industrial or governmental context. It is centered around a technological problem, subject to time, project management, and project deliverable constraints. Assessment criteria for the design project encompass design skills, technical knowledge, professional skills, and reporting/presentation skills. The EngD competence level guide (Appendix 3) details the criteria subcategories for the design process. During the project, it is advisable for the EngD candidate to interact with experienced designers, guaranteeing access to practical expertise, pertinent technical and methodological insights, and familiarity with various stages of the design process.

6.2 ENGD THESIS

For the design project assessment, the EngD-candidate must write an EngD thesis. The thesis is in principle public, unless an embargo period was agreed at the beginning of the process. The thesis format is determined by mutual agreement between the candidate, the Scientific Supervisor, the Design Supervisor and, if applicable, the External Supervisor on behalf of the client and it should focus on the ILOs. Appendix 4.1 provides a thesis template suggestion, which can be tailored to the needs of the project. The minimum requirements for the thesis are:

a) specification of design requirements,
b) description of the design process consisting of the following four stages (or variants of these): investigation, creation, evaluation, impact and utilization and,
c) description of the output of the design research methodology followed: a product or process artefact.

A mandatory title page follows the thesis cover (see template on Appendix 4.2). For additional information about the EngD thesis, refer to Article 5.1 of the EngD Charter.

7 PROGRAMME MILESTONES

Figure 1 presents the key milestones of the EngD-candidate in chronological order. Figure 2 details the last 6 weeks of the EngD trajectory by zooming into the green light meeting and the defence. The following sections provide additional information.

7.1 INTAKE ENGD

Admission procedures are explained in Articles 2.1 thru 2.4 of the EngD Charter.

Upon starting, candidates are invited to an intake briefing with the TGS support office covering the two-year EngD trajectory and its related procedures as well as introducing the EngD monitoring system. The support office arranges access to the OSIRIS course registration platform.

7.2 TRAINING & SUPERVISION PLAN

The personal educational programme designed by the candidate and the supervisory team should conform with the requirements specified on Sections 5.2 and 5.3.

To upload the T&SP, the candidate should follow the link in the email sent by the EngD monitoring system or use the Dashboard (i.e. click the 'Research phase' tab, then the 'T&SP' tab). Upload the document and click 'Submit T&SP for review'.

After the T&SP approval and completion of each activity, the EngD-candidate enters details in the EngD monitoring system individually (i.e. course/activity name, number of ECs rounded to the nearest 0.5 EC[2], start and end dates, organizing institution[3], and course description). The EngD-candidate uploads completion evidence in the T&SP activity tab:

[2] One credit is equivalent to a total workload of 28 hours.

- For UT disciplinary courses: OSIRIS output, lecturer's statement/certificate, or lecture notice (i.e. 'cijferbrief').

  For **master courses with an upgrade assignment**: the EngD-candidate should ask the lecturer to confirm to the EngD-candidate by email that the upgrade assignment was successfully finished. The topic, workload in ECs, learning goals and reason why it can be considered as being on post-master level must be mentioned in the email message. The actual upgrade assignment should be uploaded into the monitoring system too.

Figure 1: Key milestones[4] of the EngD-candidate.
For additional details about the green light meeting and defence milestones, refer to Figure 2.

1. An appointment with the EngD support officer and the candidate is planned within the first two weeks of admission. The EngD support officer informs the candidate about the programme and procedures.

2. To prevent study delay, the candidate should register to (compulsory) courses before the T&SP is approved. Registration for professional development courses is done on https://www.utwente.nl/en/ctd/courses/ and for disciplinary courses via https://osiris.utwente.nl.

3. The T&SP lists the names of supervisors, supervision arrangements, the chosen set of courses, knowledge and skills to be be acquired and how this will be done. It also describes the design project. It should be uploaded within first three months of the start by the candidate and approved by Scientific Supervisor. Refer to Article 3.5 of the EngD Charter.

4. Assessment of whether the technological design proposal is of sufficient level and whether it is likely that the candidate will complete the program on time. Takes place between months 6-9 (3 months extra improvement period in case of failed qualifier). Refer to Article 2.9 of the EngD Charter.

5. An annual interview is held in month 15 (and in month 27 if applicable). Refer to Article 2.10 of the EngD Charter.

6. The candidate lists all disciplinary and professional development activities in the EngD monitoring system and uploads completion evidence and related documents. The Scientific Supervisor approves it. Refer to Article 3.6 and 5.3 of the EngD Charter.

7. Refer to Chapter 5 of the EngD Charter for details of thesis and defence preparation. At least 6 weeks before the intended defence date, the EngD-candidate emails the following documents to engd@utwente.nl:

- the title and a digital version of the draft thesis,
- the written statement by the Scientific Supervisor stating that the draft thesis is approved and free of plagiarism and,
- the list of assessment committee members (via the graduation approval form).

8. The green light meeting with the assessment committee is organized by the Scientific Supervisor. It will take place 4 weeks before the intended defence date. Refer to Article 5.5 of the EngD Charter.

9. The EngD-candidate submits the final thesis to engd@utwente.nl.

10. Defence ceremony. Refer to Article 5.6 of the EngD Charter.

11. The candidate fills in the programme evaluation form and attends an exit interview.

4 Please note that these are milestone numbers rather than month numbers.

- For *Capita Selectas*: the EngD-candidate should ask the lecturer who supervised the activity to confirm to the EngD-candidate by email that the activity was successfully finished. The topic, workload in ECs, the learning goals and related activities (e.g. self-study, tasks, interviews) must be mentioned.
- For professional development courses and non-UT courses: course certificates.
- For conference papers, posters and presentations: the conference programme listing the EngD-candidate as an author and presenter plus the actual powerpoint or poster.
- For presentations at research group seminars: a document listing the attended seminars, an email from the seminars' coordinator confirming the candidate's active participation and the actual powerpoint(s) of the presentations made.
- For peer-review: the peer-review submission confirmation email and the submitted peer review text.
- For teaching/supervision: email from the coordinating lecturer confirming and describing the candidate's involvement.
- For research event organization: email from the conference chair confirming and describing the candidate's involvement.
- For work as EngD representative/P-NUT board member: email confirmation by the TGS support officer.

Once educational activities are documented and evidence uploaded, the Scientific Supervisor will check and approve the final educational portfolio.

7.3 QUALIFIER AND ANNUAL INTERVIEW

The qualifier occurs 6-9 months into the EngD programme and evaluates the design proposal's level and potential timely programme completion. In addition, an annual interview takes place in month 15 (and if applicable, in month 27). Details can be found in Article 2.8 and Article 2.9 of the EngD Charter. Forms are available on this page.

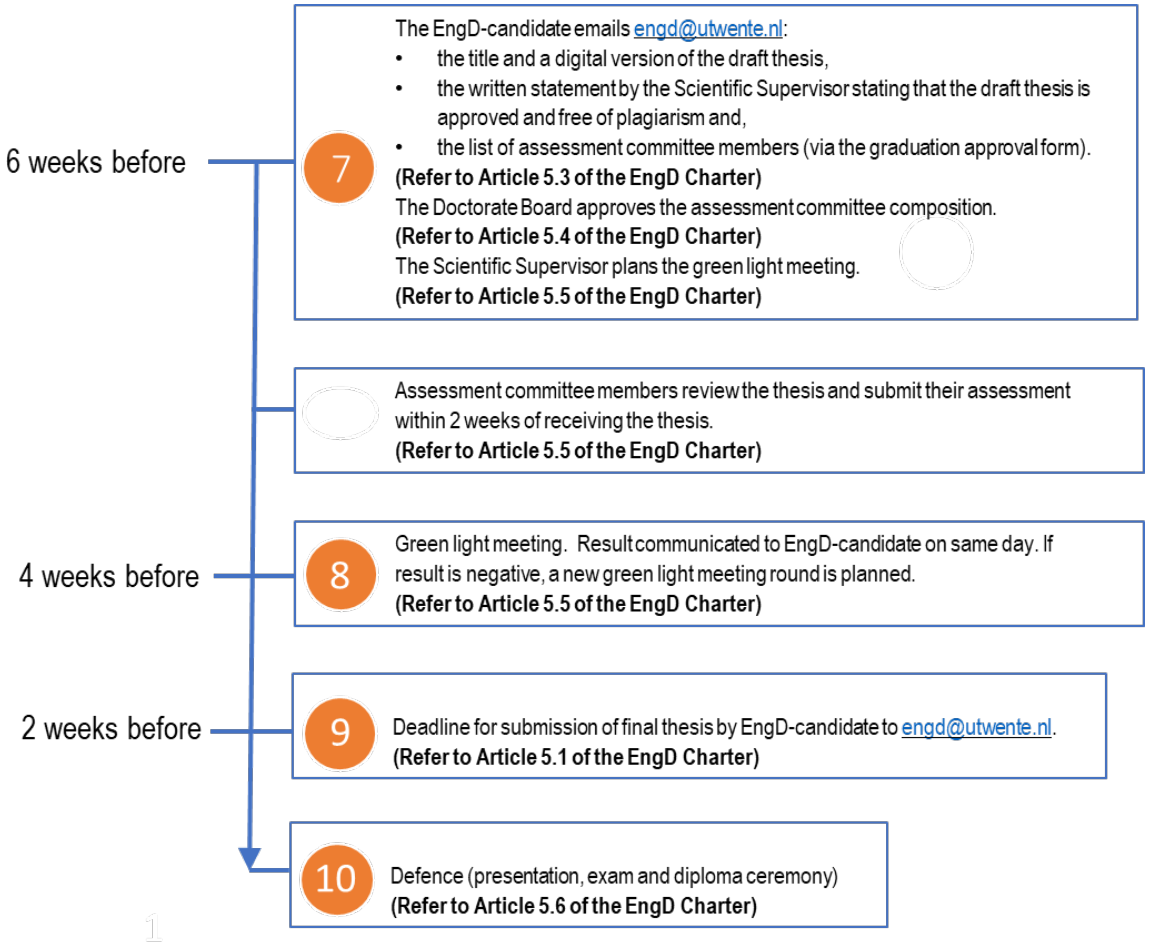
7.4 GREEN LIGHT AND DEFENCE

Defence preparations begin after the Scientific Supervisor informs the candidate that the draft EngD thesis (refer to Section 6.2) is ready and the completed education portfolio is approved in the EngD monitoring system.

Refer to Article 5.5 of the EngD Charter for more information on the green light meeting. Refer to Appendix 5.2.1 for the graduation assessment form which the committee will use to assess the thesis.

Figure 2 presents the timeline of the last 6 weeks of the EngD trajectory and explains the procedures involved in more detail.

Figure 2: Timeline of green light meeting and defence preparations



APPENDIX 1: CONTACTS AND/OR LINKS TO RELEVANT INFORMATION

Academic calendar (check the MSc calendar)	https://www.utwente.nl/en/ces/planning-schedules/academic-calendar/academic-calendars/
Canvas	https://canvas.utwente.nl/
Course catalogue Osiris	http://www.utwente.nl/onderwijssystemen/en/about_the_applications/osiris/
Course schedules	https://rooster.utwente.nl/schedule
Coursefinder (professional development courses)	https://www.utwente.nl/en/ctd/courses/?for=phd-engd
EngD Charter	https://www.utwente.nl/en/education/tgs/currentcandidates/engd/rules-regulations/charter-for-engd-candidates.pdf
EngD information for current candidates	https://www.utwente.nl/en/education/tgs/currentcandidates/engd/
EngD monitoring system	https://horafinita.utwente.nl/
EngD monitoring system information	https://www.utwente.nl/en/education/tgs/currentcandidates/
International candidates	https://www.utwente.nl/en/education/international-students/
Library, ICT & Archive (general page)	https://www.utwente.nl/en/service-portal/services/lisa/
ICT	https://www.utwente.nl/en/service-portal/services/lisa/about-us-contact/#service-desks Email: servicedesk-ict@utwente.nl Telephone: 053 489 5577
Osiris issues	https://www.utwente.nl/en/educational-systems/about-the-applications/osiris/contact/ Email: studentservices@utwente.nl Telephone: 053 489 2124
PhD/EngD Counsellor	https://www.utwente.nl/en/ces/sacc/coaching-counselling/phdcounsellor/ Email: sacc@utwente.nl Telephone: 053 489 2035 (if no answer during office hours; in case of emergency only +316 14 215 498)
University of Twente Campus map	https://www.utwente.nl/download/campusmap.pdf

APPENDIX 2: EDUCATIONAL PROGRAMME AND SUPERVISION AGREEMENTS

2.1 TRAINING AND SUPERVISION PLAN (T&SP)

2.1.1 General information

Pre-education information	
Name candidate:	
s-number (applicable to UT MSc alumni)	
MSc in…	
Year of graduation (MSc):	
Institute/University:	
EngD programme	
EngD programme:	
Scientific Supervisor:	
Design Supervisor (daily supervisor):	
Client organization name:	
External supervisor on behalf of the client (if applicable):	
Supervision agreements: (indicate the 1) agreed mode of supervision including the intended frequency and duration of meetings i.e hours per month), 2) the preferred way of communications and 3) other arrangements (if applicable).	
Start date:	
End date:	

2.1.2 Detailed Educational Plan (minimum 48 ECs)

Professional development (transferable skills) (6-10 EC)

#	Mandatory course	EC
1	Professional Effectiveness	2
2	TGS Introduction Workshop (incl. academic integrity and project management)	1.5
3	Data Management (if applicable)	1
Total		

#	Elective courses	EC
1		
2		
3		
4		
5		
Total		

#	Self-regulated courses and activities	EC
1		
2		
3		
4		
5		
Total		

Disciplinary courses

#	Course code	Mandatory courses	Level (MSc/post-MSc)	Design focus (yes/no)	Upgrade assignment (yes/no)	Period	EC
1	202400595	SDE	Post-master	yes	no	Q	12
2		Programme-specific course[5]				Q	
3						Q	
4						Q	
Total EC's			.. EC	.. EC			.. EC

#	Course code	Elective courses	Level (MSc/post-MSc)	Design focus (yes/no)	Upgrade assignment (yes/no)	Period	EC
1						Q	
2						Q	
3						Q	
4						Q	
Total EC's			.. EC	.. EC			.. EC

[5] For programme-specific mandatory courses (if applicable), refer to Appendix 6.

#	Course code	Self-regulated courses or activities *(if it involves a Capita Selecta, indicate its topic)*	Level (MSc/post-MSc)	Design focus (yes/no)	Period	EC
1					Q	
2					Q	
3					Q	
4					Q	
Total EC's			.. EC	.. EC		.. EC

Upon successful completion, the EngD-candidate must upload proof of completion for all the activities listed in this T&SP. Refer to Section 7.2 for a list per type of activity.

2.1.3 Design project

Project title:	Project description
Client organization	
Name:	
External Supervisor on behalf of the client (if applicable)	
Name: E-mail: Telephone:	
Scientific Supervisor at the UT	
Name: E-mail:	
Design Supervisor at the UT	
Name: E-mail:	

APPENDIX 3: ENGD COMPETENCE LEVEL GUIDE

Disciplinary design skills

ILO #	Insufficient (1)	Adequate (2)	Good (1)
1. Formulate problem statements, design objectives and requirements	Has little or no understanding of the problem and can't define design goals. Isn't able to define the requirements. Doesn't consider the whole design cycle. Can't plan and collect the required information.	Can define the problem and the design goals. Can define the requirements with some help. Shows awareness of the whole design cycle. Is able to plan and organize the required information.	Is able to clearly and precisely define the problem, design goals and requirements based on discussions with stakeholders. Gives proper attention to the whole design cycle. Is able to confidently plan, organize and handle the required information.
2. Demonstrate originality in the design solutions by applying creative and innovative thinking	Does not apply creative thinking to the design process. Has not demonstrated any original ideas.	Can demonstrate some creative thinking. The design is original to some extent.	Demonstrates a lot of creative thinking. Has demonstrated several original ideas not initiated by others.
3. Refine designs through analysis and evaluation, ensuring alignment with stakeholder requirements	Develops a design or architecture which insufficiently fits the stakeholder requirements.	Develops a design or architecture which sufficiently fits the stakeholder requirements.	Develops a design or architecture which exceeds the stakeholder requirements.
	Isn't able to link the stakeholder requirements to the analysis and evaluation of the design. Develops a solution without making an analysis and a design or architecture.	Is able to link the analysis and evaluation of the design to the stakeholder requirements with some help. If necessary, performs iterative updates of the design or architecture. Attempts to include qualitative and quantitative measures. Finishes the design or architecture before the implementation or prototyping.	Is able to link the analysis and evaluation of the design to the stakeholder requirements. Is able to identify additional requirements based on the iterative process. If necessary, iteratively updates the design or architecture. Is able to develop a design and architecture which are easily adaptable to future needs.
4. Employ validation methods to substantiate the effectiveness and viability of designs and architectures	Can't provide an empirical proof of the solution.	Provides an empirical proof of solution via a simulation or prototype.	Provides a formal and empirical proof of solution via a simulation or prototype.

Disciplinary technical knowledge

ILO #	Insufficient (1)	Adequate (2)	Good (3)
5. Apply disciplinary technical knowledge to analyze a design problem	Isn't able to analyze a complex problem or challenge. The reasoning and the evidence provided is weak.	Is able to analyze a complex problem in an accurate, complete and appropriate manner. The reasoning and the evidence provided is good.	Is able to analyze a complex problem in detail. The reasoning and the evidence provided is solid.
6. Explore, identify and select technologies via literature searches and expert consultations	Has little or no knowledge of concepts and relevant technologies in the field. Doesn't actively search for information or doesn't approach experts.	Has reasonable knowledge of concepts and of relevant technologies in the field. Expands knowledge through literature search or by approaching experts.	Has excellent knowledge of concepts and of relevant and emerging technologies in the field. Expands knowledge through literature search or by approaching experts.
7. Apply methods, tools, and techniques for design outcomes	Isn't able to identify suitable methods, tools and techniques and to apply them to the project.	Can identify suitable methods, tools and techniques and is able to apply them. Is able to explain why they are suitable.	Can narrow down the best methods, tools and techniques and is able to apply them. Is able to explain why they are the most suitable. Has high-level technical skills.

Reporting and presentation skills

ILO #	Insufficient (1)	Adequate (2)	Good (3)
8. Write a report which is complete, relevant, to the point and well written detailing the design, implementation, technical documentation, and validation of solutions	Isn't able to structure the document. The report isn't structured along the stages of the design cycle.	Is able to structure the document although some sections may be missing or appear in an unsuitable place. The report is sufficiently structured along the stages of the design cycle(s).	Is able to structure the document very well. The reader can navigate throughout the document effortlessly. The report is very well structured along the stages of the design cycle(s).
	Isn't able to write accurately, clearly, concisely and in a well-organized manner. Provides poor figures and layout.	Writes mostly accurately, clearly, concisely and in well-organized manner. However, the reader sometimes requires some effort to comprehend the intended meaning.	Writes accurately, thoroughly, clearly, concisely and in a well-organized manner. The figures and layout are correct and clear, with no more than a few minor flaws. Writes a document which the reader can read smoothly and effortlessly.
	Develops a document which insufficiently explains the design, implementation, technical documentation and validation.	Develops a document which sufficiently explains the design, implementation, technical documentation and validation.	Develops a coherent document which explains in detail the design, implementation, technical documentation and validation. Explains which other options were explored.

ILO #	Insufficient (1)	Adequate (2)	Good (3)
	Doesn't mention the limitations of the design or architecture.	Mentions the limitations of the design or architecture.	Mentions the limitations of the design or architecture. Provides suggestions regarding follow-up work.
9. Deliver oral presentations to technical experts, non technical stakeholders, and the general public.	Presents in an unclear and/or incomplete manner.	Presents in a clear and thorough manner.	Presents clearly and thoroughly. Is able to present to and engage with audiences from varying backgrounds.
10. Respond to questions and feedback during oral presentations	Demonstrates incomplete knowledge by responding inaccurately and/or inappropriately to questions and feedback.	Demonstrates good knowledge by responds accurately and appropriately to most questions and feedback.	Demonstrates excellent knowledge by responding accurately, thoroughly, appropriately and confidently to all questions and feedback.

Professional (transferable) skills

ILO #	Insufficient (1)	Adequate (2)	Good (3)
11. Independently execute a design project	Insufficient or no organization of meetings with sufficient supporting documents.	Organizes meetings, provides an agenda and sufficient supporting documents. Produces a list of action points.	Takes responsibility for organizing meetings, provides an agenda and provides sufficient supporting documents. Produces a list of action points and timely follows up. Effectively coordinates follow-up actions with others.
	Insufficient or no project management plan.	Develops a good project management plan. Planning contains milestones and individual tasks.	Develops a good project management plan. Planning contains milestones, individual tasks. Is able to explain how tasks relate to each other and if necessary, is able to effectively update the plan.
	Doesn't or can't explain the possible effect of risks on the project.	Identifies risks. Can explain the possible effect of risks on the project.	Identifies risks. Can explain the possible effect of risks on the project. Has developed a solid mitigation plan. Implements mitigation measures with confidence.
	Passive attitude. Contributes little during meetings.	Shows responsibility towards the project but requires some guidance. Asks critical questions during meetings.	Clearly owns the project and shows considerable responsibility. Is proactive; confidently takes the initiative and requires minimal guidance. Is keen to ask critical questions during meetings.

ILO #	Insufficient (1)	Adequate (2)	Good (3)
12. Collaborate in diverse teams to achieve common objectives	Has limited or no networking skills. Doesn't do anything to build a network. Misses deadlines and fails to inform stakeholders about progress and challenges that require addressing.	Understands the importance of networking; puts some effort in building or expanding a network. Works well with others. Usually carries out tasks as originally agreed upon. Informs stakeholders about progress and flags issues that need addressing.	Builds and maintains relevant networks and works very well with others. Networks with a future career in mind too. Requires very little support. Always carries out tasks as originally agreed upon. Informs stakeholders about progress in a clear and consistent way. Flags issues and proposes ways to deal with them.
	Limited or no reflection on own behaviour. Doesn't react (or doesn't react well) to feedback given by supervisors. Provides little or no constructive feedback to others.	Shows awareness about the importance of reflecting on own behaviour. Reacts well to feedback received and is increasingly becoming a better professional. Provides constructive feedback to others.	Reflects very well on own behaviour. Reacts professionally to feedback to the point of impressing colleagues. Provides timely, clear and relevant constructive feedback to others.
	Isn't an active listener and often responds quickly without reflecting. Isn't a confident or engaging presenter and lacks experience targeting communication to different audiences. English-speaking skills are basic (e.g. B2).	Listens actively and reflects before responding. Is a confident presenter. Is able to target presentations to different audiences. Has sufficient English-speaking skills (e.g. C1).	Listens actively and expresses ideas and opinions very clearly. Is a confident, inspiring and engaging presenter who is able to target presentations to different audiences. Fluent English-speaker (e.g. level C2).
13. Demonstrate commitment to uphold academic integrity principles	Has limited knowledge of the Netherlands Code of Conduct for Academic Practice. Shows limited reflection on their integrity and behaviour.	Has good knowledge of the Netherlands Code of Conduct for Academic Practice. Demonstrates choices that reflects integrity and responsible behaviour.	Has excellent knowledge of the Netherlands Code of Conduct for Academic Practice. Consistently makes choices that reflect integrity and responsible behaviour.

APPENDIX 4: THESIS

4.1 THESIS TEMPLATE

This template is a suggestion; it can be therefore tailored to the needs of the project.

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Acknowledgements

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   - Techno-economic feasibility
   - Impact (environment, societal, risk)
8. **Conclusion and Future work**
9. **Literature**
10. **Appendices**

4.2 TITLE PAGE ENGD THESIS

TITLE

EngD Thesis

to obtain the degree of
Engineering Doctorate (EngD) at the University of Twente,
on the authority of the rector magnificus,
prof.dr.ir. A. Veldkamp
on account of the decision of the graduation committee,
to be defended
on Wednesday the Day of Month Year at 12.45 hours

by

Full names

This EngD Thesis has been approved by:

Scientific Supervisor: Name Scientific Supervisor

Design Supervisor: Name Design Supervisor

External Supervisor on behalf of the client: Name External Supervisor on behalf of the client (if applicable)

Graduation committee:

Chair: ……

Scientific Supervisor: ……

Design Supervisor: ……

External Supervisor on behalf of the client: (if applicable)

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APPENDIX 5: GRADUATION

5.1 APPROVAL FORM FOR GRADUATION

Please fill in the information below and ask your Scientific Supervisor for a signature to approve your thesis and educational programme. To obtain the approval of the TGS Dean, email this document to engd@utwente.nl.

Engineering Doctoral candidate		
Name:		
M-number:		
S-number:		
Place of birth:		
Date of birth:		
EngD Programme		
EngD programme:		
Faculty:		
Title thesis:		
Green light meeting date:		
Intended graduation date:		
Pre-education Engineering Doctorate candidate		
Academic Title:		
Discipline:		
Year of graduation:		
Institute/University:		
Graduation committee		
Name including title:	***Affiliation:***	***Role in the committee*:***
1. Dr. 2. 3. 4. 5. 6.	University of Twente	
Signatures		
Scientific Supervisor	***Dean TGS***	
	Prof.dr. A. Need	

*Refer to Article 5.4 of the EngD Charter for details about the assessment committee composition.

5.2 ENGD GRADUATION ASSESSMENT FORM

Name candidate: ……………………………………………………………………… Project title: ……………………………………………………………………… ………………………………………………………………………	M- number: …………………… S-number: …………………… Thesis ECs: …………………… Report: □ public □ confidential, embargo until: …………. (Refer to Article 5.1 of the EngD Charter)
Committee members: …………………………………………………… …………………………………………………… …………………………………………………… …………………………………………………… …………………………………………………… ……………………………………………………	EngD programme: □ Not graduated (F) □ Graduated (P)
Signature Chair: …………………………………………… Signature Scientific Supervisor: ……………………………………………	Date: …………………………………

5.2.1 Thesis assessment form

Intended Learning Outcomes	Mark with an X according to the Competences Level Guide				Comments
	Insufficient (1)	Adequate (2)	Good (3)	Inapplicable	
Disciplinary design skills **The candidate demonstrates the ability to:**					
Formulate problem statements, articulate design objectives, and establish requirements					
Demonstrate originality in the design solutions by applying creative and innovative thinking					
Refine designs through analysis and evaluation, ensuring alignment with stakeholder requirements					
Employ validation methods to substantiate the effectiveness and viability of designs and architectures					
Disciplinary technical knowledge **The candidate demonstrates the ability to:**					
Apply disciplinary technical knowledge to analyze a design problem					
Explore, identify and select technologies via comprehensive literature searches and expert consultations					
Apply suitable methods, tools, and techniques for design outcomes					
Reporting and presentation skills **The candidate demonstrates the ability to:**					
Write a report which is complete, relevant, to the point and well written detailing the design, implementation, technical documentation, and validation of solutions					
Deliver oral presentations to technical experts, non-technical stakeholders, and the general public					
Respond to questions and feedback during oral presentations					

Pass: all criteria are at least rated as ‘Adequate’.

APPENDIX 6: ENGD PROGRAMME-SPECIFIC INFORMATION

6.1 BUSINESS & IT (BIT) PROGRAMME

Programme Management

The coordination of the Business & IT (BIT) programme is done by the Faculty of Electrical Engineering, Mathematics and Computer Science (EEMCS).

The programme director (Dr L. Ferreira Pires, telephone: 053 489 3843) and the coordinator Business & IT programme (A. van Os, telephone: 0534891279) form a team that together strategically develops the EngD Business & IT programme on the one hand and operationally implement it on the other.

A. van Os is the first contact for content, operational, and EngD monitoring system related questions. They handle candidate intake interviews, monitoring via the EngD monitoring system and provides guidance regarding graduation procedures.

Programme committee:

The role of the program committee entails:

- Monitoring the quality of education and quality assurance,
- Advising on curriculum-related matters,
- Providing input and advice regarding the study guide,
- Providing advice, both solicited and unsolicited and,
- Using their network for project recruitment.

Chairman	Dr. L. Ferreira Pires
Members	Prof.dr. G. Heijenk
	Prof.dr. M.E. Iacob
	Prof.dr. W. Jonker
	Dr.ir. M. van Keulen
	Dr. M. Mes
	Prof.dr. A. Rensink
	Dr.ir. M.J. van Sinderen
	Dr. L. Montoya (TGS education manager, non-voting member)
	A.van Os

Table 5. Other BIT programme contacts

Design project issues	Contact your Scientific Supervisor
Canvas issues	E-mail: canvas-eemcs@utwente.nl

Table 6: List of mandatory courses, popular elective courses and *Capita Selecta* codes for Business & IT candidates.

	Osiris course code
Mandatory courses	
Systems Design & Engineering for EngD	202400595
Plus choose 1 out of the following 4 courses:	

Business Process Integration Lab for EngD	202001482
Enterprise Architecture for EngD	202001483
Architecture of Information Systems for EngD	202001484
System Validation	192140122
Popular elective courses	
Topic: E-business Architectures	
Service-oriented Architecture with Web Services	192652150
Information Systems for the Financial Services Industry	194105070
Multi Agent Systems	192320601
Topic: E-business Processes and Coordination	
E-commerce	192320501
Complex Networks	201800222
Stochastics Models in Production & Logistics	191531830
Topic: Security	
Internet Security	201700074
Cybersecurity Management	201500041
Blockchain and Distributed Ledger Technologies	201700079
Topic: Data Analytics	
Data Science	201400174
Research Experiments in Databases and Information Retrieval	201300074
Advanced Machine Learning	201600071
Other activities	
Capita Selecta 1 BIT *Capita Selecta* 2 BIT	202001486 202001522

6. 2 MAINTENANCE (M) PROGRAMME

Programme Management

The coordination of the Maintenance programme is done by the Faculty of Engineering Technology. The persons and committees mentioned in this section are the relevant committees for Maintenance programme candidates.

Prof.dr.ir. M.B. (Matthijn) de Rooij is the programme director. If you have content-related questions, please contact them at m.b.derooij@utwente.nl or 053 489 1178.

Programme committee:

The role of the program committee entails:

- Monitoring the quality of education and quality assurance,
- Advising on curriculum-related matters,
- Providing input and advice regarding the study guide,
- Providing advice, both solicited and unsolicited and,
- Using their network for project recruitment.

Confirmation needed from M. de Rooij regarding the list below:

Chair: Prof.dr.ir. M.B. de Rooij
Members: Prof.dr.ir. T. Tinga
Prof.dr.ir. P.M. Lugt
Prof.dr.ir. L.A.M. van Dongen

Prof.dr. W.H.M. Zijm
Dr. Lorena Montoya (TGS education manager, non-voting member)

Table 7. Other Maintenance programme contacts

Design project issues	Contact your Scientific Supervisor
Canvas issues	Alexander Jansen Email: canvas-et@utwente.nl

Table 8: List of mandatory courses, popular elective courses and *Capita Selecta* codes for Maintenance candidates.

	Osiris course code
Mandatory courses	
Systems Design & Engineering for EngD	202400595
Plus choose 1 out of the following 5 courses:	
Failure Mechanism & Life Prediction for EngD	201600356
Structural Health and Conditioning Monitoring for EngD	201600358
Design for Maintenance for EngD	201600359
Maintenance Engineering & Management for EngD	201600360
Model Driven Engineering for EngD	201800179
Popular electives	
Solids en Surfaces	191155700
Surface Technology	191155710
Adhesion and Bonding Technology	202100228
Elastomer Design and Engineering for EngD	201900038
Plastic and Elastomer Engineering for EngD	201600352
Tribology	191155730
Experimental Methods	201400046
Other Activities	
Capita Selecta 1 EngD M	201400551
Capita Selecta 2 EngD M	201400553

6. 3 ENERGY & PROCESS TECHNOLOGY (EPT) PROGRAMME

Programme Management

The coordination and organisation of the Energy & Process Technology programme is done by the Faculty of Engineering Technology. The persons and committees mentioned in this section are the relevant committees for Energy & Process Technology programme candidates.

Prof.dr.ir. A.K. (Artur) Pozarlik is the programme director. If you have content related questions, please contact them at a.k.pozarlik@utwente.nl or 053 489 2658.

Programme committee:

The role of the program committee entails:

- Monitoring the quality of education and quality assurance,
- Advising on curriculum-related matters,
- Providing input and advice regarding the study guide,
- Providing advice, both solicited and unsolicited and,

- Using their network for project recruitment.

Chair: Prof.dr.ir. A.K. Pozarlik
Members: Prof.dr. S.R.A. Kersten
Prof.dr. A. Blume
Ir. A. Rikhof
Dr. L. Montoya (TGS education manager, non-voting member)

Table 9. EPT programme contacts

Design project issues	Contact your Scientific Supervisor
Canvas issues	Alexander Jansen Email: canvas-et@utwente.nl

Table 10: List of mandatory courses, popular elective courses and *Capita Selecta* codes for EPT candidates.

	Osiris course code
Mandatory courses	
Systems Design & Engineering for EngD	202400595
Plus choose 1 out of the following 6 courses:	
Advanced Chemical Reaction Engineering for EngD	201600151
Process Equipment Design for EngD	201300155
Energy Conversion Technology for EngD	201600019
Plastic and Elastomer Engineering for EngD	201600352
Elastomer Science & Engineering for EngD	201500344
Energy, Sustainability and Society for EngD	201700029
Popular electives	
Advanced Molecular Separation	201300049
Process Plant Design (incl. Thermodynamics & Flowsheeting)	201300045
Thermodynamics & Flow sheeting	193735010
Chemical Reaction Engineering	201600218
Transport Phenomena	191141700
Sustainable Process Technology	201200240
Membrane Process Plant Design	201200118
NIOK courses	External
OSPT courses	External
Solar Energy	201700025
Wind Energy	201700024
Energy from Biomass	201700023
Energy Storage	201600252
Computational Fluid Dynamics (CFD)	191154731
Elastomer Design and Engineering	201500517
Rubber Technology Course	External
RPK-C	External
Advanced Materials	193530020
Solids and Surfaces	191155700
Design, Production and Materials	191121720
System Innovation and Strategic Niche Management	201700030

Energy Transition (MOOC-RUG)	External
Electrical Power Engineering and System Integration	201700026
Other activities	
Capita Selecta 1 EPT	201300173
Capita Selecta 2 EPT	201300174

6. 4 CIVIL ENGINEERING (CE) PROGRAMME

Programme Management

The coordination of the Civil Engineering programme is done by the Faculty of Engineering Technology. The persons and committees mentioned in this section are the relevant committees for Civil Engineering programme candidates.

Dr. S.R. (Seirgei) Miller is the programme director. If you have content related questions, please contact them at s.r.miller@utwente.nl or 053 489 5886.

Programme committee

The role of the program committee entails:

- Monitoring the quality of education and quality assurance,
- Advising on curriculum-related matters,
- Providing input and advice regarding the study guide,
- Providing advice, both solicited and unsolicited and,
- Using their network for project recruitment.

Chair: Dr. S.R. Miller
Members: Prof.dr.ir. E.C. van Berkum
Prof.dr.ir. A.G. Dorée
Dr. J.T. Voordijk
Dr. F. Vahdatikhaki
Dr. Lorena Montoya (TGS education manager, non-voting member)

Table 11. Other Civil Engineering programme contacts

Design project issues	Contact your Scientific Supervisor
Canvas issues	Alexander Jansen Email: canvas-et@utwente.nl

Table 12: List of mandatory courses, popular elective courses and *Capita Selecta* codes for Civil Engineering candidates.

	Osiris course code
Mandatory courses	
Systems Design & Engineering for EngD	202400595
Technology Development and Management for Civil Engineering	201700009
Popular electives	
Structural Health Condition and Monitoring for EngD	201600358
Modelling & Simulation	191211110
Data Science	202300200
Machine learning in engineering	201900097

Other activities	
Capita Selecta 1 EngD CE	201300169
Capita Selecta 2 EngD CE	201300171

6. 5 ROBOTICS (ROB) PROGRAMME

Programme Management

The coordination and organisation of the Robotics programme is done by the Faculty of Engineering Technology. The persons and committees mentioned in this section are the relevant committees for Robotics programme candidates.

Dr.ir. T.H.J. (Tom) Vaneker is the programme director. If you have content related questions, please contact them at t.vaneker@utwente.nl or 053 489 2472.

Programme committee

The role of the program committee entails:

- Monitoring the quality of education and quality assurance,
- Advising on curriculum-related matters,
- Providing input and advice regarding the study guide,
- Providing advice, both solicited and unsolicited and,
- Using their network for project recruitment.

Chair: Dr.ir. T.H.J. Vaneker
Members: Dr.ir. J.F. Broenink
Dr.ir. R.G.K.M. Aarts
Prof. dr. ir. G.M Bonnema
Dr. Lorena Montoya (TGS education manager, non-voting member)

Table 13. Other Robotics programme contacts

Design project issues	Contact your Scientific Supervisor
Canvas issues	Alexander Jansen Email: canvas-et@utwente.nl

Table 14: List of mandatory courses, popular elective courses and *Capita Selecta* codes for Robotics candidates.

	Osiris course code
Mandatory courses	
Systems Design & Engineering for EngD	202400595
Plus choose 1 out of the following 6 courses:	
Automated Production Systems	202000030
Design Principles for Precision Mechanics for EngD	201600355
Industrial Robotics Systems	202000032
Modelling and Simulation	191211110
Modelling, Dynamics, and Kinematics for EngD	202300124
System Identification with Parameter Estimation and Machine Learning	202200111
Popular electives	
Robot Perception, Cognition, Navigation	202200105
Human-Robot Communication	202200102
Machine Learning in Engineering	201900097

Discrete Optimization	191581100
Manufacturing Facility Design	191102041
Flexible Multibody Dynamics	201900037
Control System Design for Mechatronic Systems	201900093
Control System Design for Robotics	202200104
Image Processing and Computer Vision	202200103
Software Development for Robotics	202200108
Advanced Software Development for Robotics	202200109
Other activities	
Capita Selecta 1 EngD ROB	201300176
Capita Selecta 2 EngD ROB	201300177

APPENDIX 7: CODES OF ETHICS, SCIENTIFIC INTEGRITY, PLAGIARISM, FRAUD AND COPYRIGHT

The University of Twente is subject to a Code of Ethics, which provides behavioral guidelines for its university community. The code is not binding but provides the opportunity to hold one another accountable for their conduct. It includes the basic principles for the professional conduct of any individual who, as an employee, candidate or student, is part of the University of Twente and/or represents the university. The objective of this annex is to summarize the regulations and procedures regarding academic misconduct, fraud and plagiarism that apply to all EngD-candidates.

7.1 ACADEMIC MISCONDUCT OR FRAUD

EngD-candidates are trained on the topic of scientific integrity in the mandatory TGS course on Academic Integrity and are expected to apply these standards in their work. The Netherlands Code of Conduct for Research Integrity can be found at the UT website. The rules below are concerned with examinations, assessments and group work of EngD-candidates.

Examinations and assessments

Examinations are assessments of the knowledge, insight and/or aptitude of the participating candidates, including an evaluation of the results of that assessment (article 7.10 of the WHW). A test or examination may consist of several parts. Cheating, plagiarism and fraud are actions or omissions on the part of a candidate that preclude an accurate assessment of their knowledge, understanding and aptitude.

Cheating encompasses the following actions:

1. **Unauthorized Use of Resources**: This includes using any prohibited resources or devices (electronic or otherwise) during a test or examination. Such resources are those explicitly prohibited by the examiner before the start of the study unit or examination, or those that candidates knew or should have known were prohibited.
2. **Academic Misconduct**: Conduct by candidates deemed as academic misconduct by the examiner before the start of the study unit or examination. This includes actions such as:
    a. Procuring copies of a test or examination before it takes place.
    b. Cheating through methods such as:
        I. Using cheat sheets or crib sheets.
        II. Copying the work of others.
        III. Allowing others to copy one's work.
        IV. Sending or receiving (text) messages during the test or examination.
    c. Communicating about the exam content with anyone other than invigilators while the test or examination is ongoing, including through electronic devices.
    d. Impersonating another person during a test or examination, or having someone else impersonate them.

Fraud encompasses, but is not limited to:

1. Manipulating research data in (group) assignments.
2. Falsifying data, such as completing questionnaires or answering interview questions oneself.
3. 'Free-riding', which involves not contributing equally to a group assignment (see below).

Plagiarism is defined as using someone else's work or one's own work without proper citation, encompasses, but is not limited to:

1. Using (parts of) other people's work, including original terms, ideas, results, conclusions, illustrations, or prototypes, and presenting them as one's own. Plagiarism occurs if parts of another text (printed or digital) are used without attribution, even if minor changes are made.

2. Using visual or audio material, test results, designs, software, and program codes without attribution, thereby presenting them as one's own original work.
3. Using verbatim citations without attribution or clear indication, such as omitting quotation marks, indentation, or leaving white space, creating the false impression that (part of) these citations are one's own original work.
4. Citing literature that one has not personally read, for instance, using references taken from someone else's work.
5. Using texts written in collaboration with others without explicitly mentioning this collaboration.
6. Submitting work that has already been published in whole or in part elsewhere (e.g. work from other courses or educational programs) without referencing the original source.

In instances of cheating, plagiarism, or fraud, the candidate's work will not be evaluated, and the EngD Board of Examiners (EngD BoE) will be notified. The EngD BoE retains the authority to bar the candidate from participating in the respective exam for a maximum duration of 1 year. In cases of premeditated fraud, the examination board reserves the right to disqualify the candidate from participation in any exams for a maximum period of 1 year.

Regulations regarding fraud and plagiarism in written work and (group)assignments

Individual assignments

There is one author who will receive a grade based on the assignment. If passages are included or information is used which are/is derived from other people's work, the EngD-candidate must clearly indicate, e.g. by:

- which passages these are (e.g. by printing them in italics or between quotation marks);
- where they come from (by providing a clear source reference: a formal literature reference or a phrase such as "verbal information from XX person").

Group assignments with explicit individual contributions

Different group members are responsible for different components of the assignment.

- clearly list which group member was responsible for which component of the assignment;

If passages are included or information is used which are/is derived from the components written by other group members, the EngD-candidate must clearly indicate, e.g. by:

- which passages these are (e.g. by writing them in italics or between quotation marks);
- where they come from (by providing a clear source reference: a formal literature reference or a phrase such as "verbal information from XX person").

Group assignment without explicit individual contributions

The group collectively bears responsibility for the entirety of the report, even if individual members contributed different components to the assignment. In such instances, specifying each member's contribution is unnecessary. It is important to note that when incorporating external sources, the guidelines for individual assignments also apply.

Literal copying or paraphrasing of someone else's work without proper source referencing constitutes plagiarism. Both the act of copying without appropriate attribution and permitting one's work to be copied are deemed instances of plagiarism/fraud. During collaborative group assignments, the entire group may be held accountable for any fraudulent activity.

Free-riding behavior

Free-riding behavior occurs when an EngD-candidate benefits from the efforts of others while delivering little or no proportional contribution to a group assignment. They may gain a positive grade from the group's efforts despite making minimal input. Contribution in this context can encompass knowledge, skills, or effort.

Possible consequences and sanctions for free-riding include:

- Insufficient development of skills needed to complete individual assignments.
- Risk of receiving a lower grade compared to other group members.
- The examiner may report the behavior as potential fraud to the Examination Board.
- The examiner may assign the EngD-candidate a new or additional task, which could also be part of the sanctions imposed by the EngD Board of Examiners.

If candidates observe free-riding within their project group, they can take the following actions:

- Discuss the issue in a group meeting, utilizing their own skills and knowledge of providing and receiving feedback.
- Address group members directly, referencing the documented distribution of tasks and any observed lack of collaboration.
- If the situation does not improve, timely contact the course coordinator/lecturer for assistance.

7.2 PROCEDURE IN CASE OF FRAUD OR PLAGIARISM

If an examiner or invigilator has a motivated suspicion of fraud before, during or after an exam, the examiner/invigilator makes a note of this on the EngD-candidate's exam (test). The examiner also notes the circumstances surrounding the irregularity and fills out the Notification of Fraud and Irregularities form. This notification is submitted to the EngD BoE.

- The examiner/invigilator has the right to temporarily confiscate devices and other resources whose use is not permitted during an exam;
- The candidate has the right to finish the exam;
- The examiner/invigilator reports the suspicion of fraud in written (by filling in a Notification of Fraud and Irregularities form) to the candidate, their Scientific Supervisor and to the EngD BoE. This rule also applies in case of a suspicion of fraud in a (part of a) unit of study, such as an assignment, presentation or essay;
- The written report should at least contain the following information (to be mailed to the EngD BoE):
    a) Name of the candidate involved including EngD-candidate's number;
    b) Course name and course code. If necessary, the specific component/part of the course in which the fraud was detected should be mentioned;
    c) Written information on the suspected fraud detected and/or what conduct or misconduct occurred during the exam;
    d) Additional information (e.g. evidence from plagiarism software)
- The examiner should notify the candidate involved of the suspected fraud;
- The assessment of the assignment/exam needs to be put on hold.

7.3 MEASURES AND SANCTIONS

The EngD BoE decides which sanction the candidate receives if fraud is actually determined. The EngD BoE may give the candidate a warning or exclude a candidate who commits an academic offence from sitting the exam, test or other part of a unit of EngD programme involved.

In cases of fraud the candidate can be excluded from the exam up to a maximum of one (1) year. If a candidate commits repeated fraud, the EngD BoE may lodge a request at the Doctorate Board to end the candidate's enrolment in the programme at the University, with effect from the month following the month the fraud passed a final judgement and was made known to the EngD-candidate.

For the right to appeal against a decision taken, based on these regulations, Article 6.2 of the EngD Charter applies.

7.4 COPYRIGHT

EngD-candidates may come into contact with copyright rules, for example, because they use publications (journals and streams) that are subject to copyright. The person who holds the copyright is usually indicated on the first page or in the publishing details. In some cases, it is permissible to make photocopies or otherwise copy existing texts and images without permission of the copyright holder. However, certain rules are applicable under the provisions of or pursuant to the Dutch Copyright Act. This includes:

- When making photocopies from books, magazines, newspapers and other written materials, only a small section may be copied. Short articles that have been published in daily or weekly newspapers and magazines may be copied in their entirety (Article 16b, paragraph 1 of the Dutch Copyright Act);
- It is permissible to cite directly from a publication in one's own work, provided the original source and author are included. The maximum permitted size relates to the purpose of making the copy (Article 15a of the Dutch Copyright

Act).

Lectures are copyrighted work. The University of Twente holds the copyright to lectures and may decide whether an EngD-candidate may film them; this also applies to audio recordings. Permission from the member of teaching staff concerned is therefore required before an EngD-candidate may film or record a class or lecture. If the staff member gives their permission for a lecture to be recorded, the recording must remain for the personal use of the EngD-candidate; dissemination of the film is not permitted. Privacy legislation means that fellow EngD-candidate may not be filmed when recording a lecture.