Technische Universiteit
Eindhoven
University of Technology

Education guide **2011-2012**

Master Program
Electrical Engineering

Where innovation starts

Education guide
2011-2012

Master Program
Electrical Engineering

Welcome

Dear student,

Welcome in the exciting world of Electrical Engineering!

This guide will give you all the relevant information of our Electrical Engineering Master program at Eindhoven University of Technology with information on the structure, content and organization of our two-year program as well as a lot of practical information.

Besides the information in this guide, it is very important to regularly check our education website OASE (owinfo.tue.nl), regarding the actual course schedule, examination schedule and details about each of the Master courses.

If you have any remaining questions, please do not hesitate to visit the "Education Office" (PT 1.26), the student counselor (PT 1.27) or me (PT 1.29).

I wish you a lot of success and pleasure in completing your Master program.

Prof.dr.ir. Bart Smolders | Director of Education, Electrical Engineering.

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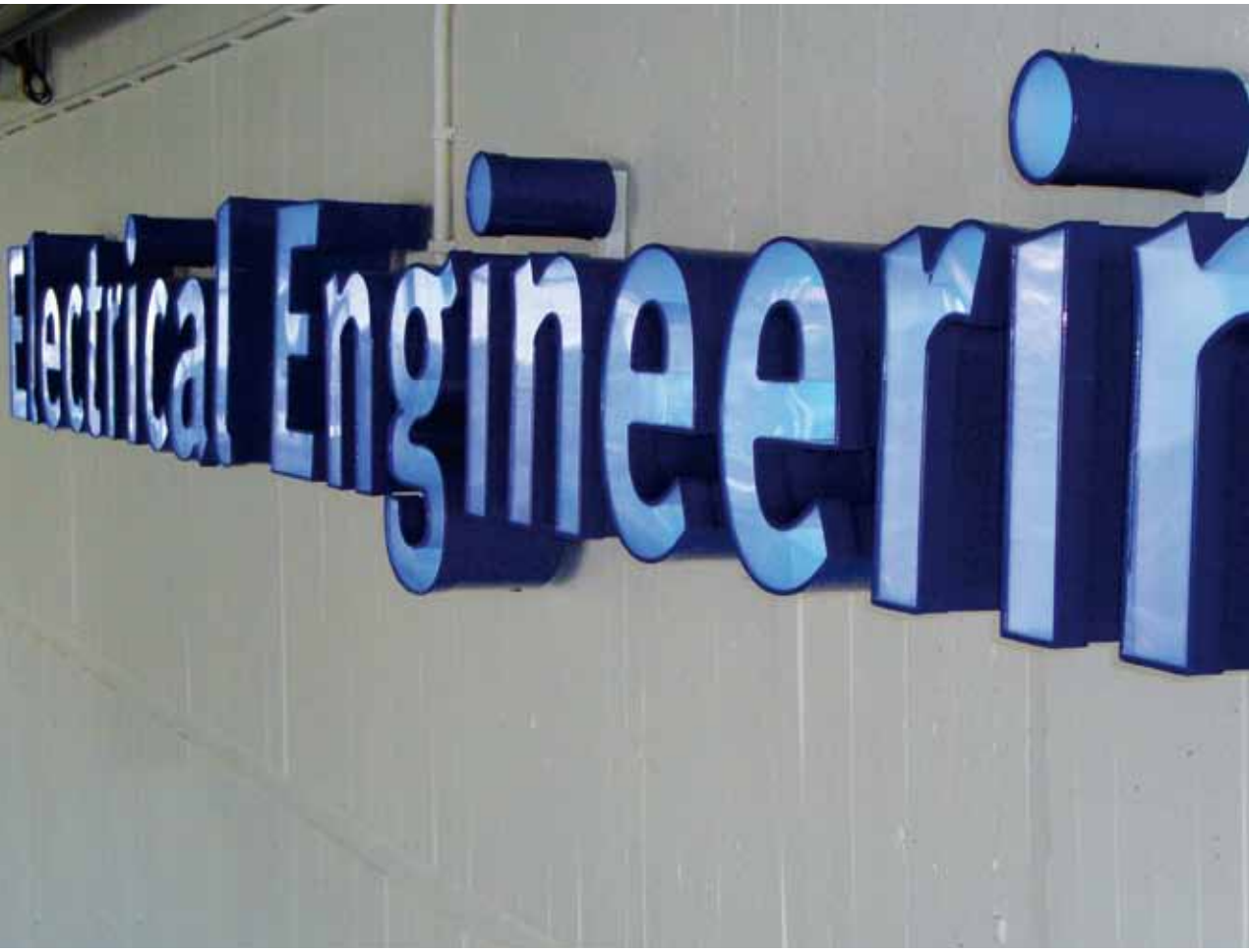
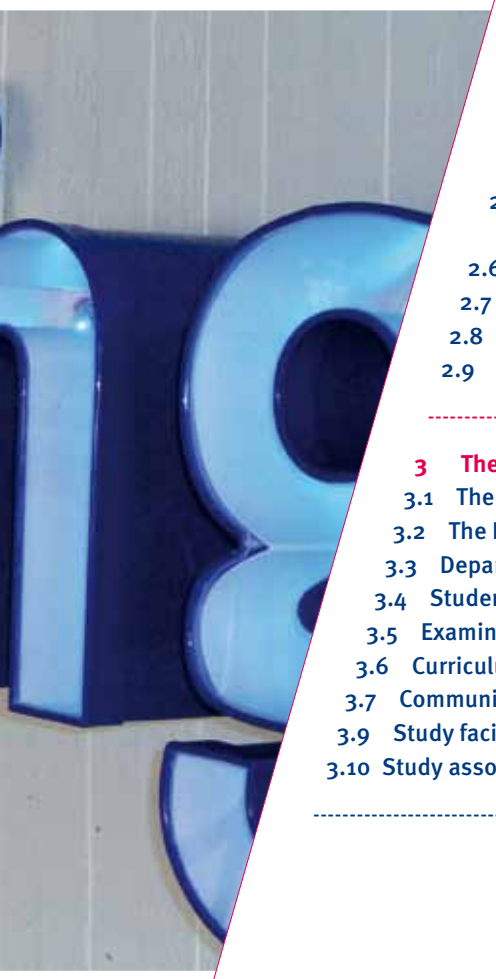




1. The Electrical Engineering Master Program

1.1. What is Electrical Engineering?

Electrical Engineering is about many things that are essential parts of people's lives. It involves power generation, communication, healthcare and the environment, and electrical engineers solve a wide range of problems related to these topics. The department's research is strongly focused on smart, innovative electrical components and on the design of electrical systems, which may become rather complex. We cooperate closely with the regional high-tech industry and with other partners all over the world. The Electrical Engineering discipline is constantly changing. As a graduate of the Electrical Engineering Master Program you will find yourself equipped for researching, discovering and exploring new boundaries and for leading others along that way.

Student Koen Verkerk

"I like plenty of variation in this Master's program. I don't like to focus on one small topic. That's why I like this Master's so much: it's a broadly based program, in which you are free to choose a specialization for your graduation work. Why did I choose Control Systems? Most of all because you can apply the theories to so many different practical situations. In general, the strong links with practice are a big plus point of studying here at TU/e. I like the fact that many of the teaching staff give lectures on a part-time basis, and work in industry the rest of the time. That makes sure the content of the program is always right up-to-date."

1.2 Goals of the Master Program

The purpose of our Master Program is to enable students to work independently on complex research and design projects with the ability to rethink existing concepts and develop new ones. In the final phase of the program students will be able to present the results of their work to an international community. The curriculum of the Electrical Engineering Master Program comprises a compulsory part, electives, one or more internships and finally a graduation project in which the student demonstrates his/her engineering ability to a high standard.

All courses belonging to the program are taught in the **English** language. There is an introduction program for foreign students in August (usually in the week of August 29th). This program will be posted on the Master Program homepage of the Electrical Engineering intranet in due time.

A graduate engineer will have acquired the following specific skills:

- Sufficient **insight into the subject matter**, methods and techniques of each of the specializations within the core subject area to be able to consult international professional literature with successful results;
- The ability to communicate **with specialists** from other core subject areas at a professional level;
- **Deep insight into his own specialism**;
- Such a thorough knowledge of the subject matter, methods and techniques that he can apply it to working out problems and **developing new knowledge** where necessary;
- The ability to read **professional literature** in international journals with a critical eye and find reference points for further development or application;
- Ability to navigate his subject's literature that he can **independently keep his knowledge up to standard** and extend it.


Koen Verkerk

In the area of research a graduate engineer should have acquired the following skills:

- **Analysis of complex problems** and recognition of analogies between complex problems;
- **Formulation of a hypothesis;**
- **Formulation of a working plan** for the testing of hypotheses;
- **Evaluation of the results** of an experiment or confirmation of the results of a hypothesis;
- **Evaluation of the possible conclusions** to be drawn from research results and how far these can be generalized.

Finally, an engineer must be able to communicate in his subject area by:

- **writing a paper in English** on a subject of study (research or design);
- **making a significant contribution to a scientific discussion** on a technical subject.

1.3 Outline of the Master Program

Table 1 Electrical Engineering Master Program outline

Course name	ECTS	Quartile
Mini-program 1	12	Q1 and Q2
Mini-program 2	12	Q2 and Q3
Internship 1	9	any quartile
Professional Development	9	(see below)
Electives	18	any quartile
Internship 2	14	any quartile
Graduation project	46	any quartile

The Education and Examination Regulations of the Electrical Engineering Master Program are available from intranet.

1.3.1 Basic courses (mini-programs)

The Master Program starts with 2 mini-programs, each of which must be selected from a set of five. A mini-program consists of four coherent courses.

1.3.2 Professional development
Professional Development is a set of three courses from various disciplines, relevant for your Master Degree.

1.3.3 Elective courses
The Master of Electrical Engineering consists of at least 18 ECTS of elective courses. Valid elective courses are Master courses or 3rd year Bachelor courses offered by Electrical Engineering, by other TU/e departments or by other universities.

1.3.4 Internships
An internship is a small research project which prepares for the larger graduation project.
The internships are intended to be an orientation within the area of Electrical Engineering.
- One small internship (9 ECTS, 6 weeks), and
- One larger internship (14 ECTS, 10 weeks)

1.3.5 Graduation project
The final part of the Master Program is the graduation project (46 ECTS). It takes 9 months (nominally) to complete the graduation projects. A student is allowed to start his/her graduation project if no more than three electives remain to be completed (9 ECTS in total).

1.4 Types of Education

You will encounter different types of education in the Master of Electrical Engineering. These are described below.

1.4.1 Lectures
During lectures theoretical knowledge is presented and is accompanied by relevant practical applications. The purpose of a lecture is to pass on knowledge and gain insight. In presenting the theory the teachers often make use of slides, which will be made available on the Digital Learn and Work Environment (OASE) (see 1.7) after the lecture has taken place. The lectures are demanding for both teacher and student who will need to prepare for the lecture by reading the material beforehand. It is also important for students to make their own notes during the lecture to highlight the main issues and examples.

1.4.2 Exercise sessions
Many lectures have accompanying instructions to enable application of the theory through exercises. This is mainly an individual task. These instruction groups are smaller to allow the teacher to respond to individual questions. So make full use of this instruction and ask questions. Instructions are recognized as a successful way to get through the course material.

1.4.3 Tutorials
A tutorial is a combination of lecture and instruction whereby theory alternates with exercises.

1.4.4 Video-lectures
Many lectures have been recorded on video. You can watch these lectures at a time that suits you. See http://videocollege.tue.nl.

Alumnus Richard Engelaar
"In my work as a technology consultant at Accenture I don't even use the specialized knowledge from my studies on a daily basis. But every day I still feel I gained a valuable basis at TU/e. The social skills, the way you think, the network you build up there: all these things are a big benefit for your career. Also important was my international internship – I spent six months working in New Zealand. The broader

outlook is greatly valued by employers. I've only been working for one and a half months, but I already find the combination of technology and business very attractive. And my work is very varied: as a consultant you get an inside look at many different companies and organizations. I want to continue doing this for quite a while, I'm already sure of that!"

1.5 Internationalization

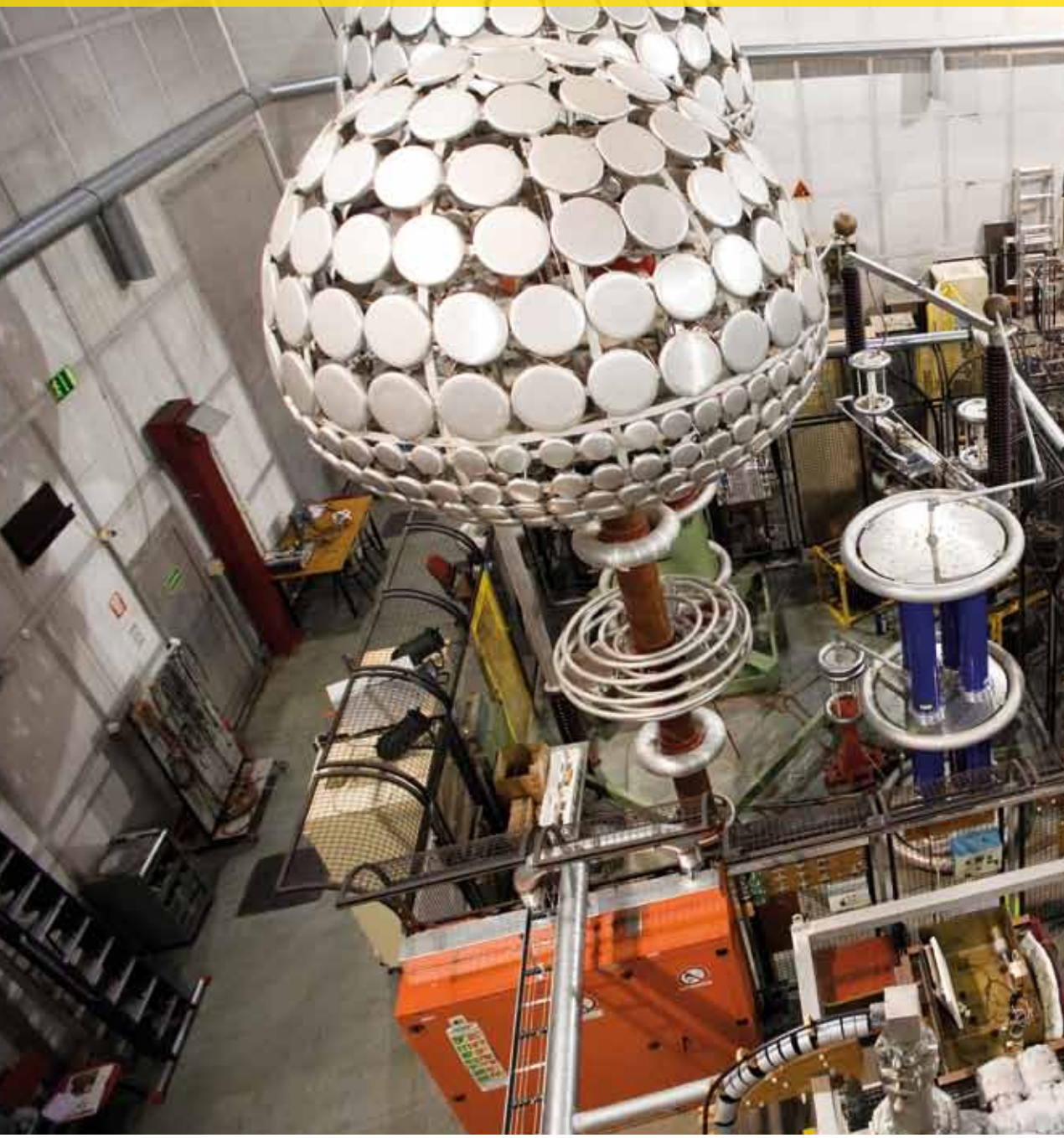
If you wish to study abroad you will have plenty of opportunities, certainly within the Master curriculum. The internships (23 ECTS) and the graduation project can be carried out in many universities and companies abroad through the research contacts of the department. If you are interested, talk to your graduation supervisor about this option. You can also go abroad for some elective courses. You can do this via exchange programs. See the intranet for more information.

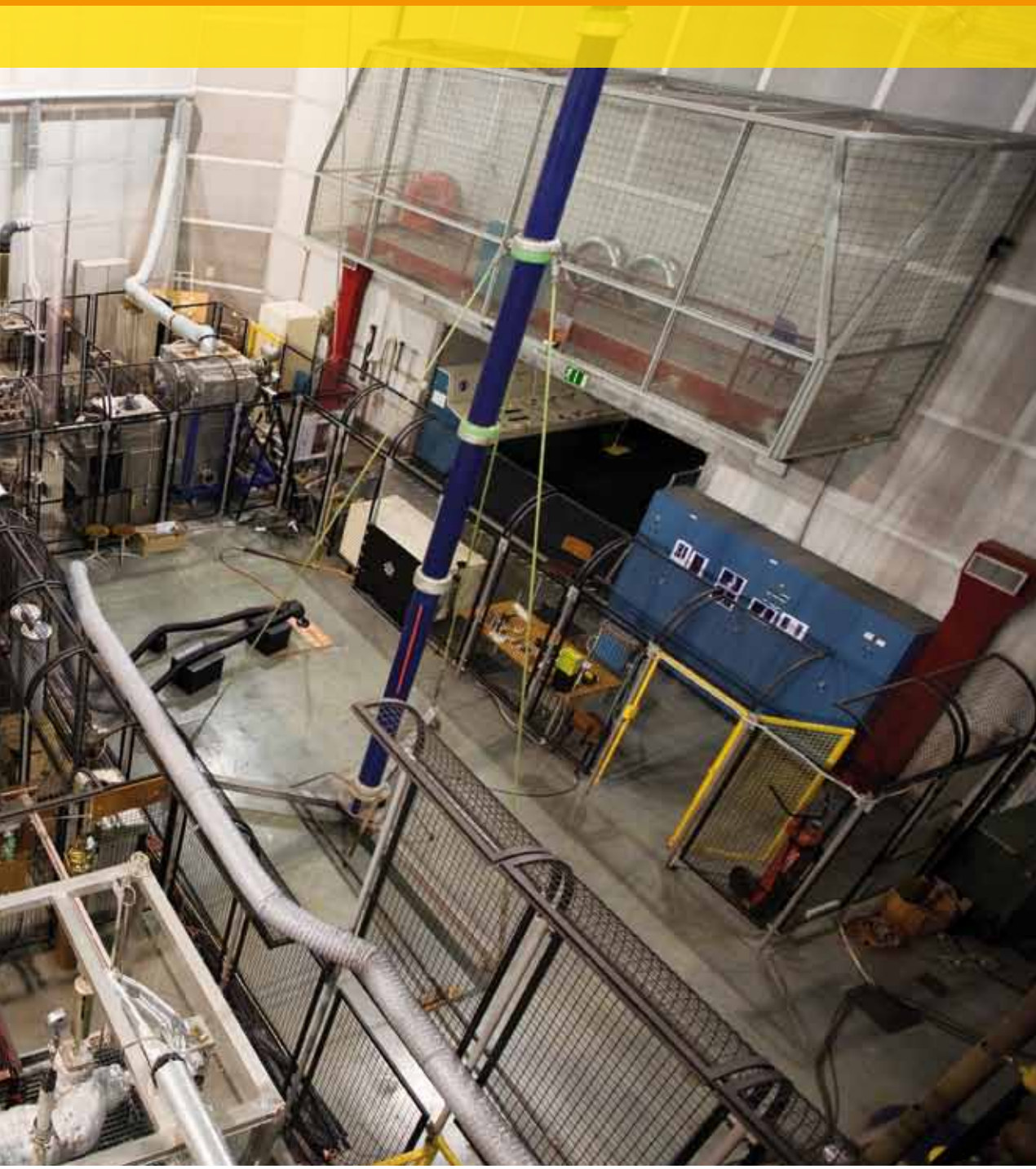
1.5.1 How to organize this?

It is important to allow enough time to prepare well. There are many sources of information, for example the International Relations Office at the TU/e. Talk to your graduation supervisor, if you have one, and try to contact students who have already been abroad before you. In the department of Electrical Engineering you can always contact the study abroad coordinator Lies Termeer e.j.a.termeer@tue.nl, PT 1.26, telephone 040 247 4429.

1.5.2 Language

Whatever country you go to, it is much more pleasant if you can speak the language, at least enough to get by on a daily basis. So take the time to work on this. The TU/e Language Centre has many facilities to help you with this.
Center for Communication, Language & Technology
HG 0.72, P.O. Box 513 5600 MB Eindhoven
phone: 31(0)40-247 2912, fax: 31(0)40-247 5654
ctt@tue.nl





1.6 Examinations

1.6.1 Different kinds of examinations

Two kinds of exams are usual: written and oral. But in the Master Program the teaching staff also frequently makes use of assignments, sometimes in combination with an oral explanation. Which kinds of examination apply to a specific course can be found at http://owinfo.tue.nl.

1.6.2 How and when

The timetable for exams can be found on http://owinfo.tue.nl. A written exam lasts for a maximum of three hours. You have at least two opportunities a year for any course. You need to register for each exam. See below, under Registration for exams. In the case of an oral exam the teacher often schedules a time slot in consultation with the students.

1.6.3 Registration for examinations

If you wish to take an exam, you must register via OASE (see 1.7). Mind the deadline for registration. You can withdraw up to five working days before the exam takes place. If you fail to withdraw you will be registered as a no-show. After three exam attempts for one course you will be blocked from registering for the exam of this course. You need to make an appointment with the student counsellor (see paragraph 3.1) before you will be allowed to retake the exam.

1.6.4 Deadline for Results

The teaching staff should determine the result of a written examination as soon as possible but no later than three weeks after the examination has taken place. This rule applies to all TU/e courses.

1.7 Digital Learning and Work Environment (OASE)

OASE is the digital learning and work environment of TU/e. In OASE you can:

- Request information about curricula, courses, exams and timetables
- Register for exams, courses and groups
- Create your personal timetable
- Consult course information
- Consult your results
- Consult your curriculum/set of courses
- Manage your email and calendar

OASE replaces the former StudyWeb (or DLWO), a term which you may occasionally encounter in older texts.

1.7.1 Log-in

OASE can be found via http://onderwijs.tue.nl/. Log-in with username and password that you use for TU/e email. By logging in, you will usually get access to more information.

1.7.2 Use of OASE

The left-hand corner contains some tabs (News, Activities, Sources, Persons and Search). When you are logged in you see five personal tabs in the bottom right-hand corner: Profile, Email, Agenda, Results and Timetable. These tabs contain all the information that is relevant for you.

News contains all the news about the university and the courses for which you have registered. You can change the news feeds that you wish to receive. Activities provides all the course information. You can also register here for courses and exams. When you are logged in, you can also see a list of the courses for which you are registered as well as a

folder with course material, announcements and timetable for these specific courses.

Sources reveals the library borrowing information and reservations. The Search tab allows you to look for information within OASE.

The personal tabs: Profile allows you to view and alter your personal data; Email guides you to your email; Agenda takes you to your calendar within Outlook; Results shows all your results to date; Timetable shows you your timetable based on the courses for which you are registered.

1.7.3 Other information sources

You may find a couple of other information sources helpful:

- For video courses: http://videocollege.tue.nl
- An alternative (and faster) site for course information and schedules: http://owinfo.tue.nl
- For more detailed program information: http://www.tue.nl and http://w3.ele.tue.nl
- For administrative information and general student services: http://w3.tue.nl/en/services/stu/

1.8 After graduating – PhD & Design program

After graduating, you may continue your education at the university, either via a post-graduate design program or via a PhD position.

The department of Electrical Engineering offers a post-graduate program in Information and Communication Technology (http://www.3tu.nl/en/education/sai/programmes/ict/). Other programs are also available (see: www.3tue.nl)

For a PhD position, check the vacancies at the website.

2. Electrical Engineering Master Program details

2.1 Master Programs

The Master Programs offered by the Department of Electrical Engineering are:

- Electrical Engineering *(120 ECTS)*
- Electrical Engineering for polytechnic *(HBO)* graduates *(30+120 ECTS)*
- Broadband Telecommunication Technologies *(120 ECTS)*
- Care and Cure *(120 ECTS)*

In the **Electrical Engineering Master** you specialize in electrical engineering and information technology on a state-of-the-art research level.

The **Electrical Engineering for polytechnic graduates Master** is based on the Electrical Engineering Master in (with a few small adjustments), but it is preceded by a so-called deficiency program of 30 ECTS. If you are currently a polytechnic student (HBO) you may consider a HBO minor (see http://www.tue.nl/en/education/from-professional-education-hbo-to-university/tue-minor-for-hbo-students/) instead of the deficiency program.

The **Broadband Telecommunication Technologies Master** (formally a Master track) focuses on broadband telecommunication and integrates knowledge from the fields of Electrical Engineering, Mathematics and Computer Science, Applied Physics, Chemical Engineering and Technology Management.

The **Care and Cure Master** (formally a Master track) focuses on care and cure and integrates knowledge from the fields of Electrical Engineering, Mathematics and Applied Physics, Control Engineering and Signal Processing.

All the education and examination regulations of the Electrical Engineering Master can be found at: http://w3.ele.tue.nl/nl/onderwijs/masteropleiding/master_of_electrical_engineering/rules_regulations/

2.2 The Electrical Engineering Master Program

Degree awarded	Master of Science in Electrical Engineering
Program length	2 years (120 ECTS)
Entrance moments	September and February

2.2.1 Admission

The general requirements for admission to a Master program of the department of Electrical Engineering are:

- A relevant Bachelor degree in Electrical Engineering (or equivalent). The Bachelor program must be of sufficient level and quality to enable you to complete the TU/e Master program.
- A sufficient command of the English language since the language of instruction is English.

A Bachelor degree from our Electrical Engineering department automatically enables admission to all the department's Master programs. For the admission procedures visit the website: http://w3.tue.nl/en/services/cec/study_information/masters_programs/electrical_engineering/admission/.

2.2.2 Mini-programs *(2 x 12 ECTS)*

The Master program starts with 2 mini-programs, each of which must be selected from a set of five. A mini-program consists of four coherent courses. You must choose one program on the first level and one on the second level.

1st level mini-programs: 1st level mini-program courses build on preceding Bachelor electrical engineering program and are intended to acquire a certain level of abstract and model thinking. They include courses in mathematics, physics and electrical engineering.

2nd level mini-programs: 2nd level mini-program courses are a first step to specializing within Electrical Engineering. A prerequisite for 2nd level mini-programs is the completion of a 1st level mini-program.

Compensation: a mini-program is completed when all courses are graded six or higher. There are two exceptions to this general rule: within one mini-program, a five can be compensated by a grade seven or higher. For a grade four, a nine or ten can compensate within the same mini-program.

No approval of your graduation supervisor is needed for the mini-programs. If you are in doubt about what mini-programs to choose, consult with your graduation supervisor or the student counselor.

Video recordings are available for most of the mini-program courses (see paragraph 1.4.7). This is probably the best way to study the mini-programs if you enter the program in February.

The tables on the next page list the 1st- and 2nd-level mini-programs.

Table 2 Electrical Engineering mini-programs

Course code		Quartile
Mini-program 1-1		
2DE08	Functional Analysis	1
5MX00	Dynamical Systems	1
2DE09	Nonlinear Optimization	1
2DE11	Numerical Mathematics	1
Mini-program 1-2		
5MX00	Dynamical Systems	1
2DE07	Discrete Mathematics	1
5MC10	Combinatorial Algorithms	2
5MX10	Modern Physics and Optics	1
Mini-program 1-3		
2DE15	Complex Analysis	1
5ME10	Statistical Signal Processing	1
5ME00	Signal Processing for Communication	1
5MX10	Modern Physics and Optics	1
Mini-program 1-4		
2DE15	Complex Analysis	1
2DE11	Numerical Mathematics	1
5MG00	Mathematics for Electromagnetism	2
5MX10	Modern Physics and Optics	1
Mini-program 1-5		
2DE15	Complex Analysis	1
5MX00	Dynamical Systems	1
3S330	Classical Physics	1
5MI00	Energy Degradation	1

Course code		Quartile
Mini-program 2-1		
5MY00	Adaptive Array Signal Processing	2
5MB20	Adaptive Information Processing	3
5SC20	State Space Control	2
5MB10	Model Reduction	3
Mini-program 2-2		
5MD30	Structured Electronic Design	3
5MD20	Design Automation	3
5MD00	Computer Architecture	2
5MY10	Wireless Communication	2
Mini-program 2-3		
5MF00	Waves & Antennae	3
5MY10	Wireless Communication	2
5MY00	Adaptive Array Signal Processing	2
5TT40	RF Transceiver Electronics	3
Mini-program 2-4		
5MH20	EM Theory Wave Guides	3
5MH00	Computational Electromagnetics	2
5MH10	Electro-optic Devices	2
5MH30	Optical Communication Technologies	3
Mini-program 2-5		
5MJ10	Planning and Operation of Power Systems	2
5MJ00	Electrical Machines	2
5MJ30	Realization of Power Converters	3
5MJ20	Electromagnetic Compatibility	2

2.2.3 Professional Development *(9 ECTS)*

One of the components of the Master of Electrical Engineering is Professional Development. This is a set of three courses from various disciplines that are relevant for your Master Degree.

Project Management (5KK94, 3 ECTS, semester A or B)
Master students act as team leader for one semester. Students may complete this topic in either the first or the second semester. It is necessary to apply via StudyWeb (http://studyweb.tue.nl). The dates will be posted on OWINFO (http://owinfo.tue.nl).

Entrepreneurship (1ZS01, 3 ECTS, Q1)
The course's core consists of the analysis of a business plan of a small start-up high-tech company. It is possible to include the follow-up of this course, 1ZS02 as an elective into the Master program.

Development of (Electro) Technology
(0K411, 3 ECTS, Q3)
This course is offered by the department of Industrial Engineering & Innovation Sciences. Some of the lectures will be given by guest speakers. The central topic will be the professional and societal impact of the electrical engineer in past, present and future.

2.2.4 Two internships *(9 and 14 ECTS)*

Purpose of Internships
An internship is a small research project which prepares for the larger graduation project. The internships are an orientation within the area of electrical engineering. For this reason, students are advised to take their internships in two different groups.
They also prepare for the Master specialization, and provide a first acquaintance with the group in which you will graduate.

Finding an internship
To find an appropriate internship, address one of our staff members, and discuss with him or her what you would like to do, where and when. The better you know your preferences, the more likely it is that one of our staff may be able to find the right project for you. If you try to find an internship in a specific company, ask the company for existing research contacts with the EE department. If you wish to go to a specific


Danail Hristov

country, contact the foreign study coordinator Lies Termeer, e.j.a.termeer@tue.nl, PT 1.26, telephone 040 247 4429.

Standard Internships
The common way of completing the internships is to take one small internship (9 ECTS, 6 weeks), and one larger internship (14 ECTS, 10 weeks). Both internships are supervised by a staff member of the department of Electrical Engineering. They may be carried out within the department (internal), outside it (external), or as a combination. For a (partially) external internship, an external supervisor is also needed for daily supervision. The EE staff member, however, remains formally responsible for the internship.

Combined Internships
As an external internship is difficult to finish within 9 or 14 ECTS, it is possible to combine both standard internships into a single internship of 23 ECTS. This is allowed if a substantial part takes place outside the university.

Consequences for the Graduation Project
A student is free to choose the group in which the graduation project will take place, with one exception. If all internships have been taken in the same group (which is automatically the case if you only take a combined internship), that same group may only be chosen for the graduation project if:

- You take an additional supplementary internship (8 ECTS) within the context of your electives and carry it out in a different group than the other internship(s), or
- You have taken a combined internship which has been carried out abroad, or
- The group chairman argues in a letter to the examination committee that the internship(s) and your graduation project are sufficiently diverse.

To make sure all prerequisites are fulfilled, check with the student administration of the department. For each internship you need to fill out a separate internship contract to be handed in at the student administration PT 1.26 before you start the internship.

Student Danail Hristov

"Making new discoveries, trying new things: that's what makes Electrical Engineering such a challenge. I want to be among the best in my own field, and TU/e gives me the chance to do that because it's one of the world's top universities of technology. The biggest plus-point at TU/e is the international environment in which you live and work. And don't forget the contacts with high-tech industry: I've benefited from those by first doing research at KPN, and then graduating at T-Mobile Nederland. The practical experience you gain is also very valuable; you learn a lot in an organization like that, simply because you want to prove yourself every day. Eventually I'd like to use my knowledge in other parts of the world, for example in my own country Bulgaria."

2.2.5 Electives *(18 ECTS)*

The Master of Electrical Engineering consists of at least 18 ECTS worth of electives. Valid elective courses are Electrical Engineering Master courses or 3rd year Bachelor courses, or course from other TU/e departments or at other universities. Mini-program courses are also valid electives. Where there is doubt, the examination committee will decide if a course is admissible as an elective. Currently, the department offers some 25 elective courses. Some electives will only be taught when there are 10 or more interested students, so do not hesitate to inform the teacher of your interest in time.

The amount of 18 electives is divided as follows:

- a minimum of 10 ECTS for regular electives. These electives need the approval of the graduation supervisor. Your graduation supervisor will consider the relevance of the electives for the Master project and for your Master degree as a whole.
- a maximum of 8 credits for free electives. For these electives you do not need approval of your graduation supervisor.

For these free electives you may choose from the regular courses, but you may also take:

- a supplementary internship (8 ECTS) after filling out the required internship contract http://w3.ele.tue.nl/fileadmin/ele/onderwijs/Master_formulieren/Internship_Contract.xls;
- 1ZS02 Business Plan Development (this is an extension of Entrepreneurship);
- 5N490 Management Activities.

The chosen electives are listed on the graduation contract that needs to be filled out and approved before starting your graduation project. The graduation contract can be downloaded from the intranet.

2.2.6 Graduation Project *(46 ECTS)*

The final part of the Master program is the graduation project. It takes nine months (nominally) to complete the graduation projects. A student is allowed to start his/her graduation project if a maximum of three electives remain to be completed (9 ECTS in total). The rules and regulations for the graduation project can be found at the intranet. They specify all the details of carrying out a graduation project.

Finding a suitable Graduation Project

Before December of your 2nd year, but preferably sooner, you must select your graduation supervisor. You take the initiative to contact him/her yourself and together you need to agree upon the topic of the graduation project. The approval of your graduation supervisor is also required in determining the ten or more credits of regular electives.

The essentials of the graduation project are stipulated in a graduation contract between student and graduation supervisor and should be filled out and signed before actually starting your project. You can find this contract on the intranet (http://w3.ele.tue.nl/nl/onderwijs/.

Paper
The graduation project is concluded by writing a graduation paper of between 8 and 12 pages (in line with the IEEE Publications format), which describes the project and its results, and is ready to be submitted as a regular contribution to a periodical. Mrs. Meerbach takes care of the distribution of the graduation papers. The website contains an example of such a paper.

Panel
To evaluate and grade the graduation project, the examination committee appoints a graduation panel of four or five staff members for a student who is about halfway through the graduation work. The student's graduation supervisor will be part of the panel as an advisory member, and therefore has no say in the grading. When the project has been finished, the panel meets with the student, giving him/her the opportunity to present and defend the graduation work. At the end of the meeting, the panel determines the student's grade.

Graduation
In order to graduate you need to register through OWINFO (owinfo.tue.nl) for the final examination. The deadline is about four weeks before the examination date. For the exact dates see OWINFO/timetables/ exam timetable. Registration always refers to the first forthcoming session of the examination committee.

The examination committee discusses the student, determines a final grade for the graduation project, checks whether all the Master obligations have been fulfilled and, if so, sets the date for presentation of the diploma.

To graduate "cum laude" (with distinction) you need to have:
- an overall (unweighted) grade average of 8.0 or higher for all the courses that are part of the program;
- a graduation project grade of 9.0 or higher;
- no program courses graded below 6.0.

Alumnus Pim Jacobs
"Have you ever visited a power station or stood next to a high-voltage pylon? That really gives me a kick! What I like about Electrical Engineering in general, and my specialization of energy technology in particular, is that you're really making something physical. As well as that, choices in energy technology have a big impact on society. For my graduation project I did research at KEMA in Arnhem into a method for measuring the condition of medium-voltage cables while they are still in normal operation. Now, as a network strategist at TenneT, I'm responsible for the future development of the high-voltage grid. It's good to know that my work contributes to a sustainable future for energy supplies."

2.3 The Broadband Telecommunication Technologies Master track

Degree awarded	Master of Science in Electrical Engineering with Certificate Broadband Telecommunications Technologies
Program length	2 years *(120 ECTS)*
Entrance moments	September and February

Telecommunication technology is a key enabler for today's information society. The rapidly increasing demand for speed and capacity, which more than doubles every two years, together with the increasing need for mobility, makes it a field with strong dynamics and frequent introductions of new technologies in the network.

Telecommunication technology is one of the broadest specializations; it integrates knowledge from the fields of:

- Electrical Engineering
- Mathematics and Computer Science
- Applied Physics
- Chemical Engineering
- Technology Management

After successful completion of the 120 ECTS you receive your Master of Science in Electrical Engineering and a Certificate for completing the Broadband Telecommunication Technologies program.

Table 3 Broadband Telecommunication Technologies Master Program outline

Course name	ECTS	Quartile
Mini-program 1/BTT Preparation	12	Q1 and Q2
Mini-program 2/BTT Core Program	12	Q2 and Q3
Internship 1	9	any quartile
Professional Development	9	(see below)
Electives/BTT-Broadening	12	any quartile
Electives	6	any quartile
Internship 2	14	any quartile
Graduation project	46	any quartile

2.3.1 Admission

Refer to 2.2.1 for admission details.

2.3.2 Mini-programs *(2 x 12 ECTS)*

The two mini-programs for BTT are pre-determined by the department.

Table 4 Broadband Telecommunication Technologies mini-programs

Course code		Quartile
Mini-program	**BTT-1**	
2DE11	Numerical Mathematics	1
5MX10	Modern Physics and Optics	1
5ME00	Signal Processing for Communication	1
2DE14	Queuing Networks	3
	BTT-2	
5MF00	Waves & Antennae	3
5MY10	Wireless Communication	2
5MH10	Electro-optic Devices	2
5MH30	Optical Communication Technology	3

2.3.3 BTT Broadening *(12 ECTS)*

You must select four of the following seven elective courses:

Table 5 Broadband Telecommunication Technologies broadening electives

Course code	Course name	Quartile
5MH20	EM Theory of Wave Guides	3
5TT40	RF Transceiver Electronics	3
5MY00	Adaptive Array Signal Processing	2
0EL70	Regulations and Standards for Wireless Communication	4
5TT30	Photonic IC Design	3-4
5TT60	Photonic Integration Technology	3
5TT00	Optical Communication Networks	4

2.3.4 Professional Development *(9 ECTS)*
The general EE rules apply for the Professional Development courses. Refer to 2.2.3 for details.

2.3.5 Two internships *(9 and 14 ECTS)*
The general EE rules apply for the two internships. Refer to 2.2.4 for details.

2.3.6 Electives *(6 ECTS)*
The remaining 6 credits for electives can be chosen without need for supervisor approval. Apart from that, the general EE rules apply. Refer to 2.2.5 for details.

2.3.7 Graduation Project *(46 ECTS)*
The general EE-rules apply for the graduation project. Refer to 2.2.6 for details.

2.4 The Care & Cure Master track

Degree awarded	Master of Science in Electrical Engineering with Certificate Care & Cure
Program length	2 years *(120 ECTS)*
Entrance moments	September and February

The health industry is a growing employer of electrical engineers. The Care & Cure Master track prepares for a career in this specialization. After successful completion of the 120 ECTS you receive your Master of Science in Electrical Engineering and a Certificate for completing the Care & Cure program.

Table 6 Care & Cure Master Program outline

Course name	ECTS	Quartile
Mini-program 1/C&C Preparation	12	Q1 and Q2
Mini-program 2/C&C Core Program	12	Q2 and Q3
Internship 1	9	any quartile
Professional Development	9	(see below)
Electives	18	any quartile
Internship 2	14	any quartile
Graduation project	46	any quartile

2.4.1 Admission

Refer to 2.2.1 for admission details.

2.4.2 Mini-programs *(2 x 12 ECTS)*

The two mini-programs for C&C are predetermined by the department.

Table 7 Care & Cure mini-programs

Course code		Quartile
Mini-program C&C-1		
5ME10	Statistical Signal Processing	1
5MG00	Mathematics for electromagnetism	2
5MX10	Modern Physics and optics	1
2DE15	Complex Analysis	1
	C&C-2	
5MY00	Adaptive array signal processing	2
5MB20	Adaptive information processing	3
5MH00	Computational Electromagnetics	2
5SC20	State-space control	2

2.4.3 Professional Development *(9 ECTS)*

The general EE rules apply for the Professional Development courses. Refer to 2.2.3 for details.

2.4.4 Two internships *(9 and 14 ECTS)*

The general EE rules apply for the two internships. Refer to 2.2.4 for details.

2.4.5 Electives *(18 ECTS)*

The 18 credits for electives can be chosen as specified in 2.2.5.

2.4.6 Graduation Project *(46 ECTS)*

The general EE rules apply for the graduation project. Refer to 2.2.6 for details.

2.5 The Electrical Engineering Master Program for HBO-graduates

Degree awarded	Master of Science in Electrical Engineering
Program length	2.5 years *(150 ECTS)*
Entrance moments	September and February

The Electrical Engineering Master program for HBO graduates is based upon the general EE Master program. To resolve deficiencies, mainly in mathematics, a set of Bachelor courses is added to the program. On the other hand, fewer credits need to be taken in internships. Table 8 outlines the program. It is possible to follow one of the EE tracks (see 2.3 and 2.4) instead of the general Master program; in that case the mini-programs and the electives for BTT as well are governed by special rules.

Table 8 Electrical Engineering Master Program for HBO-graduates outline

1st year	**ECTS**
General bachelor courses	33
Specialization bachelor courses	9
Professional development	9
Internship	9
2nd year	
Mini-program 1 & 2	24
Electives	20
Graduation project	16
3rd year	
Graduation project	30
Total	**150**

Formally, the program is divided into a 30-ECTS pre-Master program and a 120-ECTS Master program. Students need to complete the pre-Master program before being allowed to enter the Master program. For details about the pre-Master program, see 2.5.6.

2.5.1 Admission

This Master program is open to students with a Polytechnic (HBO) Bachelor degree in Electrical Engineering or equivalent. If in doubt, consult the coordinator of the program, Jan Vleeshouwers (j.m.vleeshouwers@tue.nl). Students with foreign equivalent diplomas need to apply through the formal admissions procedure for foreign students, see http://w3.tue.nl/en/services/stu/ and select “Master admission”.

With a regular HBO bachelor diploma in Electrical Engineering, the Master Program is as outlined in Table 8. In order to speed up the transition from HBO to university, some HBO schools allow an HBO semester to be traded for the initial part of the EE Master Program (the so-called HBO minor). For details contact our HBO program coordinator, Jan Vleeshouwers, or see the intranet: http://www.tue.nl/en/education/from-professional-education-hbo-to-university/tue-minor-for-hbo-students/

2.5.2 General Bachelor courses *(33 ECTS)*

Each HBO graduate needs to pass the Bachelor courses listed on the next page (33 ECTS, each course is 3 ECTS). The table lists the quartiles in which the courses should be followed depending on the moment of entrance. Courses marked with “V” must be followed via video recordings (see paragraph 1.4.7).

Table 9 Electrical Engineering Master Program for HBO graduates – general Bachelor courses

Course code	Course name	Quartile	
		September entrance	February entrance
2DL03	Basic Calculus	1	3
2DL06	Linear Algebra	1	3
5LL90	Introduction Telecommunication	1V	3
5EE20	Electrical Power Engineering	1	3V
2DL04	Calculus A	2	4
5CC35	Digital Signal Processing	2	4V
5BB05	Electrical Networks HBO	2	4
2DL05	Calculus B	3	1
2DL07	Probability & Stochastics	3	1
5EE60	Electromagnetic Fields	3	1V
5LL00	Basic Electromagnetism	4	2V

2.5.3 Specialization Bachelor courses
(9 ECTS)

An HBO graduate also needs to pass an additional set of four courses, depending on the group in which he or she wishes to do the graduation work. The table below specifies the courses to be taken. Courses marked “R” are obligatory, the remainder must be chosen from the courses marked “C”. A graduation supervisor may deviate from this table, for as long as four courses are taken from this set. When planning the courses from this table, make sure to check the necessary pre-knowledge and check for available video recordings of the courses (see paragraph 1.4.7). They may allow you to study more efficiently.

Table 10 Electrical Engineering Master Program for HBO-graduates – specialization Bachelor courses

Course name and code	Quartile	Pre-knowledge	ES	EPS	CS	EES	MSM	SPS	ECO	OED	EM
Electromechanics (5EE10)	2	3		R		R					C
Power Electronics (5EE30)	3	2	C			R					
Control (5CC50) 3	2	C	R	R	C	R	R	C		C	
Telecommunication Systems (5LL91)	3	2	C						C		C
Waves and Radiation (5GG40)	3	4				C			C	R	R
Information Theory (5K020)	3	3	C						C		C
Electronics: Basic circuitry (5GG20)	4	3	C	R	R	C	R	R	R	R	C
Adaptive Systems (5CC70)	4	3	C			C					
Performance Analysis (5CC80)	4	3	C								
Communication Theory (5JK10)	4	2	C						C		C
Computer Networks (5JJ90)	4	1	R						C		C
Optimization (5DD05)	4	1			R	C					
Computational networks (5JJ50)	4	1	R								
System Electronics (5GG70)	4	4	C			C	R		C		C
Glass Fiber Communication (5LL40)	4	4	C						R	R	C
Digital Signal Processing 2 (5CC60)	4	3	C			C		R	C		

2.5.4 Scientific internship *(9 ECTS)*

A scientific internship is a small research project which prepares for the larger graduation project. The internship is an orientation within the area of Electrical Engineering. For this reason, students are free to take this internship in the group of their choice (see 2.6). When doing an internship and a graduation project in the same group, make sure to choose topics which are sufficiently different. The internship is worth 9 ECTS (approximately six weeks' full-time work), is supervised by a staff member of the department of Electrical Engineering and is carried out within one of the department labs. To make sure all prerequisites are fulfilled, check with the student administration of the department. Before you start the internship, you need to fill out an internship contract and hand it in at the student administration PT 1.26.

2.5.5 Professional Development *(9 ECTS)*

The general EE rules apply for the Professional Development courses. Refer to 2.2.3 for details.

2.5.6 Pre-Master program

The pre-Master program includes the 30 ECTS of subjects which cannot be included in the Master program (because of its formal maximum size of 120 ECTS). The pre-Master program must be finished before a student is allowed to register as a Master student and take Master courses. The Electrical Engineering pre-Master program consists of the mathematics courses listed below, and 15 ECTS to be chosen from the other first-year courses (general and specialization Bachelor courses, professional development and internship), see Table 8.

Table 11 Electrical Engineering Master Program for HBO-graduates – required pre-Master courses

Course code	Course name	ECTS
2DL03	Basic Calculus	3
2DL06	Linear Algebra	3
2DL04	Calculus A	3
2DL05	Calculus B	3
2DL07	Probability & Stochastics	3

2.5.7 Mini-programs *(2 x 12 ECTS)*

Refer to 2.2.2 for details about the general mini-programs. For the BTT track refer to 2.3.2, for the C&C track, refer to 2.4.2.

2.5.8 Electives *(20 ECTS)*

HBO Bachelor students who follow the Master of Electrical Engineering have 20 ECTS available for electives and these are chosen in consultation with the graduation supervisor.

Valid elective courses are Electrical Engineering Master courses or 3rd year Bachelor courses, or courses of other TU/e departments or from other universities. Mini-program courses are also valid electives. Where doubt exists, the examination committee will decide if a course is admissible as an elective.

The electives can be listed on the graduation contract that needs to be filled out and approved before starting your graduation project (see 2.2.6 for more details about the graduation contract).

2.5.9 Graduation project *(46 ECTS)*

The general EE rules apply for the graduation project. Refer to 2.2.6 for details.

2.6 Research Groups

The Department of Electrical Engineering has organized its research into nine research groups, see the table below. For more information on these groups, visit our website: http://www.tue.nl/en/university/departments/electrical-engineering/research/

Table 12 Research Groups

Group	Chairman
Electrical Energy Systems (EES)	prof.ir. W.L. Kling
Electromechanics and Power Electronics (EPE)	prof.dr.ir. E. Lomonova
Electronic Systems (ES)	prof.dr.ir. R.H.J.M. Otten
Mixed-Signal Micro-electronics (MsM)	prof.dr.ir. A.H.M. van Roermund
Control Systems (CS)	prof.dr.ir. P.P.J. van den Bosch
Signal Processing Systems (SPS)	prof.dr.ir. J.W.M. Bergmans
Electro-optical Communication (ECO)	prof.ir. A.M.J. Koonen
Opto-Electric Devices (OED)	prof.dr. M.K. Smit
Electromagnetics (EM)	prof.dr. A.G. Tijhuis

2.7 Timetable and class hours

To view your personal timetable consult the OASE site (see paragraph 1.7). When you register for a course you can view your personal week or monthly timetable, changes in which are posted on the Education News of the department intranet, which has an RSS feed. A printed version of this Education News is posted on the bulletin board next to PT 1.26. Sometimes the information will also be sent to you by email.

Table 13 TU/e class hours

hour	from	until
1	08:45	09:30
2	09:45	10:30
3	10:45	11:30
4	11:45	12:30
5	13:45	14:30
6	14:45	15:30
7	15:45	16:30
8	16:45	17:30

2.8 Calendar of the Academic Year 2011-2012

The four tables below are the calendar of the academic year 2011-2012 (date: feb.2011). An up-to-date version may be found on OWINFO (owinfo.tue.nl).

Table 14 Academic Year 2011-2012 Quartile 1
Semester A - Quartile 1 | 5 September 2011 - 13 November 2011

	Sep 2011	Sep 2011	Sep 2011	Sep/Oct 2011	Oct 2011	Oct 2011	Oct 2011	Oct 2011	Oct/Nov 2011	Nov 2011
week	36	37	38	39	40	41	42	43	44	45
Mon	5 Sep start sem. A opening acad. year	12 Sep	19 Sep	26 Sep	3 Oct	10 Oct	17 Oct	24 Oct	31 Oct	7 Nov
Tue	6 Sep	13 Sep	20 Sep	27 Sep	4 Oct	11 Oct	18 Oct	25 Oct	1 Nov	8 Nov
Wed	7 Sep	14 Sep	21 Sep	28 Sep	5 Oct	12 Oct	19 Oct	26 Oct	2 Nov	9 Nov
Thu	8 Sep	15 Sep	22 Sep	29 Sep	6 Oct	13 Oct	20 Oct	27 Oct	3 Nov	10 Nov
Fri	9 Sep	16 Sep	23 Sep	30 Sep	7 Oct	14 Oct	21 Oct	28 Oct open day	4 Nov	11 Nov
Sat	10 Sep	17 Sep	24 Sep	1 Oct	8 Oct	15 Oct	22 Oct	29 Oct open day	5 Nov	12 Nov
Sun	11 Sep	18 Sep	25 Sep	2 Oct	9 Oct	16 Oct	23 Oct	30 Oct	6 Nov	13 Nov

Table 15 Academic Year 2011-2012 Quartile 2

Semester A - Quartile 2 | 14 November 2011 - 5 February 2012

	Nov 2011	Nov 2011	Nov/Dec 2011	Dec 2011	Dec 2011	Dec 2011	Dec/Jan 2011/2012	Jan 2012	Jan 2012	Jan 2012	Jan 2012	Jan/Feb 2012
week	46	47	48	49	50	51	52	1	2	3	4	5
Mon	14 Nov	21 Nov	28 Nov	5 Dec	12 Dec	19 Dec	26 Dec TU/e closed	2 Jan	9 Jan	16 Jan	23 Jan	30 Jan
Tue	15 Nov	22 Nov	29 Nov	6 Dec	13 Dec	20 Dec	27 Dec TU/e closed	3 Jan	10 Jan	17 Jan	24 Jan	31 Jan
Wed	16 Nov	23 Nov	30 Nov	7 Dec	14 Dec	21 Dec	28 Dec TU/e closed	4 Jan	11 Jan	18 Jan	25 Jan	1 Feb
Thu	17 Nov	24 Nov	1 Dec	8 Dec	15 Dec	22 Dec	29 Dec TU/e closed	5 Jan	12 Jan	19 Jan	26 Jan	2 Feb
Fri	18 Nov	25 Nov	2 Dec	9 Dec	16 Dec	23 Dec	30 Dec TU/e closed	6 Jan	13 Jan	20 Jan open day	27 Jan	3 Feb
Sat	19 Nov	26 Nov	3 Dec	10 Dec	17 Dec	24 Dec	31 Dec	7 Jan	14 Jan	21 Jan open day	28 Jan	4 Feb
Sun	20 Nov	27 Nov	4 Dec	11 Dec	18 Dec	25 Dec	1 Jan	8 Jan	15 Jan	22 Jan	29 Jan	5 Feb

Table 16 Academic Year 2011-2012 Quartile 3

Semester B - Quartile 3 | 6 February - 22 April 2012

	Feb 2012	Feb 2012	Feb 2012	Feb/Mar 2012	Mar 2012	Mar 2012	Mar 2012	Mar/Apr 2012	Apr 2012	Apr 2012	Apr 2012
week	6	7	8	9	10	11	12	13	14	15	16
Mon	6 Feb start sem. B	13 Feb	20 Feb Carnival	27 Feb	5 Mar	12 Mar	19 Mar	26 Mar	2 Apr	9 Apr Easter Monday	16 Apr
Tue	7 Feb	14 Feb	21 Feb Carnival	28 Feb	6 Mar	13 Mar	20 Mar	27 Mar	3 Apr	10 Apr	17 Apr
Wed	8 Feb	15 Feb	22 Feb	29 Feb	7 Mar	14 Mar	21 Mar	28 Mar	4 Apr	11 Apr	18 Apr
Thu	9 Feb	16 Feb	23 Feb	1 Mar	8 Mar	15 Mar	22 Mar	29 Mar	5 Apr thu=fri	12 Apr	19 Apr
Fri	10 Feb	17 Feb	24 Feb	2 Mar	9 Mar	16 Mar	23 Mar	30 Mar open day	6 Apr Good Friday	13 Apr	20 Apr
Sat	11 Feb	18 Feb	25 Feb	3 Mar	10 Mar	17 Mar	24 Mar	31 Mar open day	7 Apr	14 Apr	21 Apr
Sun	12 Feb	19 Feb	26 Feb	4 Mar	11 Mar	18 Mar	25 Mar	1 Apr	8 Apr	15 Apr	22 Apr

Table 17 Academic Year 2011-2012 Quartile 4
Semester B - Quartile 4 | 23 April - 8 July 2012

	Apr 2012	Apr/May 2012	May 2012	May 2012	May 2012	May/Jun 2012	Jun 2012	Jun 2012	Jun 2012	Jun/Jul 2012	Jul 2012
week	17	18	19	20	21	22	23	24	25	26	27
Mon	23 Apr	30 Apr Queen's Day	7 May	14 May	21 May	28 May Whit Monday	4 Jun	11 Jun	18 Jun	25 Jun	2 Jul
Tue	24 Apr	1 May	8 May	15 May	22 May	29 May tue=mon	5 Jun	12 Jun	19 Jun	26 Jun	3 Jul
Wed	25 Apr	2 May	9 May	16 May	23 May	30 May	6 Jun	13 Jun	20 Jun	27 Jun	4 Jul
Thu	26 Apr	3 May	10 May	17 May Ascencion Day	24 May	31 May	7 Jun	14 Jun	21 Jun	28 Jun	5 Jul
Fri	27 Apr dies natalis	4 May	11 May	18 May	25 May	1 Jun	8 Jun	15 Jun	22 Jun	29 Jun	6 Jul
Sat	28 Apr	5 May Liberation Day	12 May	19 May	26 May	2 Jun	9 Jun	16 Jun	23 Jun	30 Jun	7 Jul
Sun	29 Apr	6 May	13 May	20 May	27 May	3 Jun	10 Jun	17 Jun	24 Jun	1 Jul	8 Jul

2.9 Master Graduation

The table below gives the diploma ceremony dates as planned in February 2011. An up-to-date list may be found on the intranet.

Master diploma ceremony

August 30	2011	15.00 & 17.00	Blauwe Zaal
November 29	2011	16.00	Auditorium 5
February 16	2012	16.00	Blauwe Zaal
May 1	2012	16.00	Blauwe Zaal
July 10	2012	16.00	Blauwe Zaal
September 4	2012	15.00 & 17.00	Blauwe Zaal

3. The Educational Institute

3.1 The Educational Institute

Education Office
The Education Office manages the administration and logistical aspects relating to education. In addition, the Education Office identifies bottlenecks in the education program, takes care of planning and course scheduling and provides information to students and teachers.

Contact: ***Annelies Meerbach*** *(student administration), PT 1.26, telephone 040 247 3537, email a.t.meerbach@tue.nl /* ***Lies Termeer*** *(coordinator for education information), PT 1.26, telephone 040 247 4429, email e.j.a.termeer@tue.nl*

Education Information Desk
The Education Information Desk is there to answer all student questions s with regards to the education of the Department of Electrical Engineering. It is open every Tuesday and Friday from 12.30 until 13.30 and is located at the student administration office in PT 1.26.

Contact: ***Education Information Desk,*** *PT 1.26, telephone 040 247 4429, email onderwijsloketEE@tue.nl*

Director of Education
This position is filled by Prof.dr.ir. Bart Smolders. He is responsible for the organizational structure and execution of the curriculum. Each year he proposes the education and examination regulations (curriculum, including content and educational structure). He discusses the content of the courses with the Professors responsible. The Director of Education is advised by the Curriculum Committee. He is also responsible for appointing the necessary lecturers within the budget specified for this purpose. He selects the lecturers from the research programs which are relevant to the subject matter of the course.

Above all, the Director of Education is responsible for the quality of the curriculum. He informs the Curriculum Committee of his proposals with respect to the curriculum and about the quality of the education being offered. He advises the research programs if action is needed to improve quality.

Contact: ***Bart Smolders,*** *PT 1,29, telephone 040 247 3094, email a.b.smolders@tue.nl*

Student Counselor
The Student Counselor for Master's students is dr.ir. Jan Vleeshouwers. His job is to supervise, advise and provide information. He identifies bottlenecks in the system and analyses information on individual students with respect to study progress.

Contact: ***Jan Vleeshouwers,*** *PT 1.27, telephone 040 247 3217, email j.m.vleeshouwers@tue.nl*

3.2 The Departmental Board

The Electrical Engineering Departmental Board consists of three members: the dean (prof.dr.ir. Ton Backx), the board member with a research portfolio (prof.dr.ir. Arthur van Roermund), and the business managing director (drs. Suzanne Udo). The Director of Education (prof.dr.ir. Bart Smolders) is advisor to the board. There is also a student advisor, who attends meetings and, if necessary, is the voice of

the students. The College Board appoints the members and student advisor. The departmental board is mandated by the College Board to organize education and research in the field of Electrical Engineering as well as draw up contracts for personnel & finance.

Contact the secretariat of the Board: ***Monique Hunck,*** *PT 1.09, telephone 040 247 5427, email M.D.M.Hunck@tue.nl / Greetje van Gemert, PT 1.09, telephone 040 247 3195, email G.v.Gemert@tue.nl*

3.3 **Departmental Council**

The Electrical Engineering Departmental Council is the advisory body of the department of Electrical Engineering of Eindhoven University of Technology. Its task is to follow the affairs of the department closely and submit proposals to the departmental board. Members of the departmental council are chosen from among the personnel (every two years) and students (every year) of the department. The employees and students have five seats each on the council. For questions directed towards the departmental council, please contact the chairman, Guus Pemen.

Contact: ***dr.ing. Guus Pemen,*** *CR 1.14, telephone 040 247 4492, email a.j.m.Pemen@tue.nl*

3.4 **Student Body** (Studentenburo)

The StudentBuro (SB) is the part of the department of Electrical Engineering that looks after the interests of students. The SB consists of three students, who serve as a contact for students on educational matters. With their daily contact with students, the StudentBuro often notices educational issues before others. If you want to know more, please visit their website.

Contact: ***Studentenburo,*** *PT 2.33, telephone 040 247 3534, email sb@sb.ele.tue.nl*

3.5 Examination Committee

The Departmental Board appoints the Examination Committee to coordinate and organize the exams within the Department of Electrical Engineering. The members of this Examination Committee are appointed by the Departmental Board. All of these members are involved in teaching within the Department.

The Examination Committee appoints examiners to examine the students. The following persons can be appointed as examiners: teaching staff from within the Department of Electrical Engineering as well as experts from outside the university. For smooth operation during the exams the Examination Committee has drafted rules and regulations about the exam in the 'OER' (Education and Examination Regulations). The Examination Committee will make a decision in consultation with the student and teaching staff in question.

Contact: ***Annelies Meerbach,*** *PT 1.26, telephone 040 247 3537, email a.t.meerbach@tue.nl*

3.6 Curriculum Committee

The curriculum committee (in Dutch: Opleidings-commissie, OC) is appointed by the Departmental Board. Its legal tasks are:

- To advise the study program manager and the Departmental Board about the education and examination regulation (B) of both the Bachelor and Master programs
- To make an annual assessment of the execution of the education and examination regulation (M) of Bachelor and Master programs
- To advise the study program manager and Departmental Board, solicited and unsolicited, about all matters regarding the education in both the Bachelor and Master programs.

The committee focuses on the following activities:

- Monitoring and evaluation of courses
- Actions deriving from the evaluations
- Maintaining the overall view and cooperation between parties
- Preparation, initiation, execution and analysis of experiments in the education program
- Curriculum optimization and innovation
- Advice and reporting to the Faculty Board

OC meetings take place once every month. On the department website you can find information about the staff members.

Contact the curriculum committee: secretariaat.e@tue.nl

3.7 Communication Office

The communication department of the Department of Electrical Engineering is concerned with:

- study education
- pre-university college
- organizing activities like symposia
- drafting brochures
- the website and the Wall of Fame
- Connecthor and UPDAT/e
- Communication advice and communication projects

Contact: ***Pauline van Gelder,*** *communication assistant, PT 1.15, telephone 040 247 4644, email p.e.r.v.gelder.hoen@tue.nl /* ***Jan Vleeshouwers,*** *study advice, PT 1.27, telephone 040 247 3217, email j.m.vleeshouwers@tue.nl*

Connecthor
Connecthor, is the magazine of the Department of Electrical Engineering, together with the study association Thor. The magazine, published four times a year, is interesting for employees, students and alumni. More information on the website. If you have questions for the editorial staff, would you like to publish an article or want to contact the editors for any other reason, please send an email.

Contact: connecthor@tue.nl

3.9 Study facilities

Library
A selection of the book collection will move to the Central Library in De Hal. The literature collection specializes in the various scientific areas relating to the research subjects and education curriculum of the department. The Central Library is open on work days from 08.30 to 17.00. During these opening times everyone is welcome to borrow books and ask for information. PT 2.06 (former Library of the department of Electrical Engineering) will be refurbished as a study room. The plan is to create one central library for the entire university. More information can be found on the website.

Education Student Service Center (STU)
The Education and Student Service Center (STU) is located in the main building of Eindhoven University of Technology. STU provides information on student administration, internationalization, and study guidance to students, designers, PhD students and employees. More specifically STU provides the following services:

- Registration and de-registration of (foreign) students
- Payment, administration and information concerning notebook computers
- Grants, scholarships and financial support for study delay and Career advice
- Study assistance
- Ombudsman
- Admission, visa and accommodation for foreign students
- Notebook computers and education

STU is also active in policy preparation and development in the field of education law and regulations, internationalization and alumni.

Contact: ***Education Student Service Center,*** *open Monday till Friday 8.30 – 17.00, HG 0.72.*

Notebook Service Center
TU/e students can buy a notebook computer at a considerably reduced price. This subsidy falls under the Notebook Regulation scheme. First-year students who are registered for the Bachelor's or Master's curricula can make use of this offer – once only. At this moment in time more than 95% of the students are participating in the scheme. The notebook is issued with an extensive set of accessories: back-pack case, mouse, safety cable, RSI notebook stand, separate keyboard and network cable. The notebook is user-ready, i.e. including software installation. More information can be found at the Notebook Service Center (NSC) in de Hal.

3.10 Study associations

THOR
Electrical Engineering has its own study association, named THOR. It was founded in 1957 and is accessible for all Electrical Engineering students of the TU/e. THOR has three sub-associations:

- ODIN, for telecommunication technique
- ESRAC, for radio communication
- WALDUR, for three-phase current and energy technique

THOR makes things easier for students by providing a number of services. For instance, they sell study guides to Bachelor students, organize activities to prepare students for life after university, such as excursions to electro-engineering companies, study trips, symposia and meetings with graduates who talk about their career. THOR also organizes the Introduction, various informal activities, and great parties.

Contact: www.thor.edu

Walhalla
The Walhalla is a place where students and employees can meet outside work or study time. Apart from the cozy atmosphere, the Walhalla offers low-priced drinks. The Student Union THOR regularly organizes activities in the Walhalla and the department often

uses it for social occasions and drinks after work. The Walhalla is open on work days from 16.30 – 19.00.

Contact: www.hetwalhalla.nl

IEEE Student Branch Eindhoven
IEEE (the Institute of Electrical and Electronics Engineers, Inc.) is an international organization by and for electro technology and information technology engineers. Worldwide, there are more than 330,000 members.

The primary tasks of the IEEE are organizing conferences, publishing literature and publishing standards. Special sub-branches, the Societies, focus on a specific area of expertise and publish magazines, among other things.

IEEE SBE is the student branch at the TU/e. It is the most active branch of IEEE in Europe. Every year, it organizes a wide range of activities and so prepares students socially, culturally and professionally for their future. More information on IEEE SBE, its activities and memberships can be found on the IEEE student branch website.

Contact: www.ieee.tue.nl

Tech United
The robot soccer team Tech United plays in the mid-size league, the top league of the Robocup competition in which a team of five autonomous robots plays together on the pitch. In 2010 Tech United won the unofficial European Championships and came second in the World Championships. Quite a job to get a winning team. All separate design components have to be integrated into one Tech United robot soccer team that plays together. This knowledge comes into the team through a large group of people, many from the Electrical Engineering and Mechanical Engineering departments.

Contact: www.techunited.nl

University Racing Eindhoven
This team takes part each year in the Formula Student Competition, an international competition for universities and polytechnics involving around 450 teams. The electric class was launched in 2010: Formula Student Electric. URE is taking part in the first electric Formula Student race with a car from the Benelux. Races are at famous circuits such as Hockenheim and Silverstone. The team has around sixty students, many from Electrical Engineering, who work on the race car in their spare time. The team designs almost all the components itself.

Contact: www.universityracing.nl

Technische Universiteit
Eindhoven
University of Technology

More information about Master Program Electrical Engineering
tel. +31 (0)40 247 3217
e-mail: voorlichting.e@tue.nl
www.tue.nl/masterprograms/ee