

# Introduction in Electrical Engineering elective package

Introduction in Electrical Engineering	
<b>Offered by</b>	Department of Electrical Engineering
<b>Language</b>	English
<b>Primarily interesting for</b>	All students, but most relevant for students with background in AT, EE, ME, AP, CSE, SI
<b>Prerequisites</b>	Required courses: check individual courses below Recommended courses: check individual courses below
<b>Contact person</b>	ing. M.J.M. van Eerd (M.J.M.v.Eerd@tue.nl)

## Content and composition

Electrical engineering has an enormous impact on society and has been the fastest growing field in engineering over the past fifty years. Just think of the tumultuous rise of computers, the introduction of mobile telephony and key medical innovations, like the MRI scanner. The study of electrical engineering focuses on the applications of electricity and magnetism, which include renewable energy systems, telecommunication, robotics, automotive, medical equipment and computers. The field embraces both analog and digital systems in which hardware and software are equally important. Electrical engineering has a large societal impact. That's why the department puts emphasis on three social themes:

- The Connected World: the future of communication
- Care and Cure: Electrical Engineering in health care
- Smart & Sustainable Society: handling energy in a sustainable way

This elective package will give you a hands-on experience of Electrical Engineering. It includes projects in which you will work in a team of 6-8 students.

Course code	Course name	Level classification
5XFA0	Rock your baby design project	1.
5XIB0	Venus exploration design project	1.
5XWF0	Design project on wireless charging	3.

There are no precedence relationships within the package.

## Course description

### Rock your baby design project (5XFA0)

A feasibility study on the development of a bio-feedback controller for an electrically powered cradle for babies. The idea is to investigate the feasibility of the development of an 'intelligent' baby bouncer. This device should search, on the basis of a limited number of input parameters, for a rocking pattern that ensures that the baby's heart rhythm quickly recovers and the crying stops. A first order approximation is to control, on the basis of two input signals (crying intensity and heart rate), an electrically powered cradle seat, which contains a prepared baby doll.

Prior knowledge: 5ECA0 – Circuits, incl. sufficient grade for labs (EE)

5XCA0 – Fundamentals of electronics, incl. sufficient grade for labs (AT/Other)



# Introduction in Electrical Engineering elective package

## **Venus exploration design project (5XIB0)**

During this design project (OGO) you will be working in a team to design and build a system that is used to explore the planet Venus. You will develop robots equipped with sensors and actuators which drive over the surface of the planet. These robots need to cooperate with each other to complete several challenging tasks. For this purpose you will design your own wireless communication system.

Prior knowledge: 5ECA0 – Circuits (or similar course); knowledge of C programming

## **Design project on wireless charging (5XWF0)**

In the project teams of 7-8 students design, manufacture and test a system for the wireless charging of vehicles. The design includes several power electronic converters, transformer and inductor design and control of power flows in the system. The power for the charging system is supplied by a wind turbine. The system should be able to detect the presence of a chargeable vehicle. ,

Prior knowledge: 5EWA0 Electromechanics (compulsory)

5APA0 Power Electronics (recommended)