Hanze

Programme

Qualification awarded
Bachelor of Science

Length of the programme
48 months

ECTS credits
240

Level of qualification
Bachelor

Mode
Full-time

Language
Dutch, with parts in English, English

School
Institute of Engineering

Locations
Groningen

Electrical Engineering Major Mechatronics

Profile of the programme

This is a Bachelor's degree with a professional orientation applied to the theory and practice of Electrical and Electronic Engineering. The overall aim of the degree programme is to prepare students to become qualified electrical and electronic engineers who are specialists in analogue and digital technology, telecommunication, medical technology, and computer technology. Students learn how to design and build electronic equipment and systems.

In the major Mechatronics mechanical systems are optimised by adding smart hardware and software. Important themes include dynamics (motion theory), measurement and control systems and mechanics (robotics).

Learning outcomes

The graduate of the Bachelor of Electrical and Electronic Engineering programme can demonstrate that s/he has achieved the following learning outcomes:

1. Ability to analyse. The graduate demonstrates this by:
• selecting relevant information with respect to a problem statement;
• indicating possible effects on business economics, society, and the field;
• formulating a clear problem statement, goal, and task on the basis of the client's wishes;
• drawing up a list of technical and non-technical requirements;
• modelling an existing product, process, or service.

2. Ability to design. The graduate demonstrates this by:
• thinking up and selecting solutions on the basis of the list of requirements;
• creating detailed designs on the basis of the selected solution;
• taking into account the feasibility and testability of the design;
• verifying the design on the basis of the list of requirements;
• selecting appropriate design tools;
• compiling documentation about the product, service, or process.

3. Ability to realize. The graduate demonstrates this by:
• making proper use of materials, processes, methods and standards;
• assembling components into an integral product, service, or process;
• verifying and validating the product, service or process on the basis of the list of requirements;
• documenting the realization process.

4. Ability to operate. The graduate demonstrates this by:
• implementing, testing, integrating, and commencing the operating of a new product, service, or process;
• contributing to operating systems and/or maintenance plans, both corrective (monitoring and optimising) and preventive (anticipating);
• testing the performance of a product, service, or process on the basis of quality standards;
• providing feedback in case of changes in the circumstances and/or performance of a product, service, or process.

5. Management skills. The graduate demonstrates this by:
• setting up projects, estimating the amount of time and money involved, considering and estimating risks, setting up project documentation, and organising resources people and means);
• monitoring and adjusting activities in terms of time, money, quality, information and organisation,
• communicating task- and process-oriented;
• managing staff members, encouraging collaboration and delegating tasks;
• communicating and working together with others in a pluralistic, international and/or multidisciplinary environment and meeting the requirements of participating in a labour organisation.

6. Ability to advise. The graduate demonstrates this by:
• imagining him/herself in the position of the client;
• clarifying the client's need;
• translating the client's need into technically and economically feasible solutions;
• underpinning the advice and convincing the client;
• adequately maintaining relations with clients.

7. Research skills. The graduate demonstrates this by:

• formulating the goals of an intended research on the basis of the research question;
• independently selecting (scientific) literature and other sources of information in order to study the question in more depth, and to assess the reliability of the information sources;
• summarizing, structuring and interpreting results and draw conclusions with regard to the research question;
• reporting the results according to the rules of the field; critically evaluating the selected approach on the basis of the results obtained in the study, and providing suggestions for future research.

8 Professional skills. The graduate demonstrates this by:
• independently selecting and pursuing a learning goal and strategy, and reflecting on the extent to which a learning goal has been achieved;
• having a flexible attitude in various professional duties;
• weighing the pros and cons in professional and ethical dilemmas and taking decisions that take into account generally approved values and standards;
• providing and receiving constructive feedback;
• reflecting on his/her own actions, thoughts, and results;
• using various forms and means of communication to communicate effectively in both Dutch and English .

Programme

Electrical Engineering Major Mechatronics	**credits**
Year 1	60
Semester 1	*30*
ELVP22PRJ1 - Project 1	*5*
ELVP22AE1 - Circuit Analysis and Electronics 1	*5*
ELVP22APH - Applied Physics	*5*
ELVP22DE - Digital Electronics	*5*
ELVP22EMP - Embedded Programming	*5*
ELVP22PUY1 - Power Up Yourself 1	*5*
Semester 2	*30*
Semester 2	*25*
ELVP22PRJ2 - Project 2	*5*
ELVP22AE2 - Circuit Analysis and Electronics 2	*5*
ELVP22AMAT - Applied Mathematics	*5*
ELVP22PLC - PLC Programming	*5*
ELVP22PUY2 - Power Up Yourself 2	*5*
Elective	*5*
selection of following courses	
ELVP22SET - Sustainable Energy Technology	*5*
ELVP22AMEC - Applied Mechanics	*5*
ELVP25SPA - Sensor Principles and Applications	*5*
Semester 3	60
Control Systems	*30*
ELVB25CSYS - Control systems	*15*
ELVB25DCDP - Data Communication and Data Processing	*15*
Dynamic Systems	*30*
ELVB24DSYS - Drive systems	*15*
ELVB25ROB - Robotics	*15*
Year 3 Electrical Engineering major Mechatronics	90
Internship	*30*
ELVB24STG - Internship	*30*
Electives Electrical Engineering	*60*
Year 4	30
Graduation Project	*30*
ELVB24GRAD - Graduation Project	*30*

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