Biomedical Engineering

Programme course

6 credits

Medicinsk teknik

TBMT18

Valid from: 2017 Spring semester

Determined by
Board of Studies for Electrical Engineering, Physics and Mathematics

Date determined
2017-01-25

Main field of study
Biomedical Engineering

Course level
First cycle

Advancement level
G1X

Course offered for
- Biomedical Engineering, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Basic mathematics and physics. Anatomy and physiology.

Intended learning outcomes
The course aim is to introduce the interdisciplinary field of biomedical engineering. The student should be able to identify and explain aspects of technology in diagnostics and therapeutics. After passing the course the student should be able to:

- Apply and use a language appropriate for the biomedical engineering area.
- Explain and illustrate how important functions of the human body are studied using principles of engineering and quantitative methods.
- Record biomedical signal data and identify the underlying processes.
- Apply biomedical engineering knowledge on physiological problems and questions.
- Describe the use of medical data and the principles of medical decision-making.

Course content

The course is subdivided into the following themes:
Theme 1: Introduction: terminology, life and death, health care process.
Theme 2: Biopotentials: measurements of ECG, EMG and EEG.
Theme 3: Biofluids and respiration: circulation, respiration, metabolism.
Theme 4: Medical images: radiation physics, CT, MRI, ultrasound.
Theme 5: Medical data: the medical data record, telemedicine.
Theme 6: Biomaterials, biomechanics
Theme 7: Rehabilitation engineering

Teaching and working methods

The course comprises lectures/demonstrations and seminars (42 h) and laboratory work (8 h).

Examination

LAB1	Laboratory work	2 credits	U, G
UPG1	Hand-in assignments	4 credits	U, G

Grades are given as ”Fail” or ”Pass”.

Grades

Two-grade scale, U, G

Other information

Supplementary courses: Most courses within the program of Biomedical Engineering

Department

Institutionen för medicinsk teknik

Director of Studies or equivalent

Marcus Larsson

Examiner

Neda Haj-Hosseini

Course website and other links

https://www.imt.liu.se/edu/courses/TBMT18/index.html

Education components

Preliminary scheduled hours: 56 h
Recommended self-study hours: 104 h

Course literature

Additional literature

Books

Bertil Jacobson, (2006) *Medicin och teknik*
ISBN: ISBN 9144047606
John D. Enderle and Joseph D. Bronzino (eds), (2010) *Introduction to biomedical engineering*
ISBN: ISBN 9780123749796

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.