LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Introduktion till medicin och teknik
Introduction to Biomedical Engineering

EITA01, 12 credits, G1 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED BME
Date of Decision: 2023-04-13

General Information

Main field: Technology.
Compulsory for: BME1
Language of instruction: The course will be given in Swedish

Aim

The aim of the course is to introduce important areas, concepts and method in biomedical technology as well as to provide an understanding of the possibilities and challenges that are associated with measurement, analysis, and intervention of phenomena in the human body.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

know about the different organs in the human body and how they interact with eachother.

have basic knowlege in biomechanics, biomaterials, bioinstrumentation, biomecial sensors and signals, bio informatics and biomedical imaging.

know the basic principles of how different phenomena in the body can be measured and analyzed based on insights in both the mechanical and electrical properties of the body.

know the requirements related to diagnostics and treatment in technical health care systems.

know the basic principles for how to handle moral, ethics and patient safety in the medical field and how this affects the construction of biomedical technology.

Competences and skills
For a passing grade the student must

be able to analyze biomedical systems and see their respective limitations and possibilities.

be able to break down a biomedical problem into smaller subproblems.

be able to make a basic analysis of mechanical and electrical problems related to the body.

be able to apply the knowledge in biomechanics, biomaterials, bioinstrumentation, biomecial sensors and signals, bio informatics and biomedical imaging to describe how different biomedical engineering solutions work.

to coursly be able to judge a biomedical engineering solution from the moral and ethics perspective.

Judgement and approach
For a passing grade the student must

be able to interpret and discuss information from medical literature

be able to communicate with medical personal about technical systems

be able to discuss ethics, moral, and patient safety.

Contents

- Basic anatomy and physiology
- Aspects on moral, ethics, and patient safety
- Basic biomechanics
- Basics in bioinstrumentation, bio sensors and biomedical signal processing
- Basics in bioinformatics and genetics
- Basics in biomedical imaging

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Three written exams (each 3 hp). Project (2 hp). Presence at the seminars (1 hp) as well as completed laborations are required.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0112. **Name:** Written Examination 1.
Credits: 3. **Grading scale:** UG. **Assessment:** According to the assessment for the whole course.
Code: 0212. **Name:** Project.
Credits: 2. **Grading scale:** UG. **Assessment:** The project is assessed by a written report and a poster presentation. Pass is obtained after review by fellow students and teacher. **Contents:** A project concerning a medical engineering application including a theme on sustainable development.

Code: 0312. **Name:** Seminars.
Credits: 1. **Grading scale:** UG. **Assessment:** Participation in seminars and submitted diaries gives a pass.
Contents: Active participation in 6 discussion seminars. A diary of about 1 page is submitted after each seminar.
Code: 0412. **Name:** Laboratory Work.
Credits: 0. **Grading scale:** UG. **Assessment:** Pass after participation in all 4 laboratory workshops. **Contents:** 4 laboratory workshops.
Code: 0512. **Name:** Written Examination 2.
Credits: 3. **Grading scale:** UG. **Assessment:** According to the assessment for the whole course.
Code: 0612. **Name:** Written Examination 3.
Credits: 3. **Grading scale:** UG. **Assessment:** According to the assessment for the whole course.

Admission

The number of participants is limited to: No

Reading list

- Enderle J., Blanchard S.M., Bronzino J., "Introduction to Biomedical Engineering, Third Edition", Academic Press, 2012.

Contact and other information

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