Technology in Intensive Care and Surgery

Programme course

6 credits
Teknik för intensivvård och kirurgi
TBMT26
Valid from: 2019 Spring semester

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

Date determined
2018-08-31
Main field of study

Biomedical Engineering

Course level

Second cycle

Advancement level

A1X

Course offered for

- Master's Programme in Biomedical Engineering
- Computer Science and Engineering, M Sc in Engineering
- Information Technology, M Sc in Engineering
- Biomedical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, M Sc in Engineering
- Applied Physics and Electrical 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

Anatomy and Physiology, Introduction to Biomedical Engineering

Intended learning outcomes

The student should have knowledge of technologies and systems for intensive care and therapy in highly specialized care. The course also enlightens problems related to monitoring of vital functions and their usefulness from medical and ethical perspectives. The following goals should be fulfilled:

- Exemplify and demonstrate engineering skills regarding monitoring systems and
their clinical applications in intensive care, anaesthesia and ventilation.  
• Be able to assess differences between technologies used and the physiological  
  parameters measured during intensive care monitoring for adults, infants and fetus.  
• Define technical principles and applications of heart pumps.  
• Summarize the operating theatres design, equipment and organization.  
• Have knowledge regarding physical principles of tissue destructive methods in  
  surgery.  
• Have knowledge of instruments and applications for endoscopic surgery.  
• Summarize applications in laparoscopic surgery, cardiothoracic surgery and  
  neurosurgery  
• Be able to reflect on ethical aspects regarding intensive care and therapeutic  
  systems based on ethical principles and Swedish law.  
• Exemplify risks and regulations for medical devices or medical technical products  
  and summarize how to report incidents.

Course content

• Intensive care: Technical systems and clinical applications regarding intensive care,  
  anaesthesia, ventilation, monitoring of vital parameters. Examples of application:  
  fetus and neonatal monitoring, intensive care stations, cardiac/heart pumps.  
• Therapeutic systems: Technical systems for minimally invasive surgery and their  
  physiological background e.g. the operating theatre design and equipment, systems  
  for navigation, simulation and surgical planning, endoscopic surgery, electro- and  
  laser surgery. Applications from e.g. thoracic,- and neurosurgery.  
• Ethics and incidents: Ethical questions regarding intensive care, therapeutic  
  systems, transplantation and incidents.  
• Example of project work: Endoscopic surgery, Heart assistive pumps, Anesthesia,  
  Fetus- and labour monitoring, Neonatal care, Intensive care, Neuronavigation.  
• Laboratory work: The Ventilator, Electrosurgery.

Teaching and working methods

Lectures, demonstrations, symposia, project studies, laboratory work

Examination

| TEN1 | Written examination | U,3,4,5 | 3 credits  
| LAB1 | Laboratory work | U,G | 1 credits  

UPG1  Project assignment  U,G  2 credits

Grades

F, 3, 4, 5

Subject area

Other Subjects within Technology

Disciplinary domain

Technology

Department

Department of Biomedical Engineering (IMT)

Director of Studies or equivalent

Marcus Larsson

Examiner

Johannes Johansson

Education components

Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h