COURSE SYLLABUS

Prosthetic Management and Biomechanics of the Lower Limb I, 15 credits

Prosthetic Management and Biomechanics of the Lower Limb I, 15 högskolepoäng

Course Code:	HPMK19	**Education Cycle:**	First-cycle level
Confirmed by:	Utbildningsrådet Nov 28, 2017	**Disciplinary domain:**	Medicine
Revised by:	Utbildningsrådet Feb 13, 2024	**Subject group:**	MT2
Valid From:	Spring 2025	**Specialised in:**	G1F
Version:	3	**Main field of study:**	Prosthetics and Orthotics

Intended Learning Outcomes (ILO)

Upon completion of the course students should have the ability to:

Knowledge and understanding

- explain normal and pathological movement in the human body from a biomechanical perspective
- explain how internal and external forces affect the human body
- explain different amputation techniques
- show familiarity with evidence and research within the area of transtibial prosthetics
- explain different treatment options
- explain common manufacturing methods in prosthetics.

Skills and abilities

- show familiarity with the basic surface anatomy and musculoskeletal functions of the lower limb
- use biomechanical methods in analysing and evaluating lower limb prosthetic interventions
- use free body diagrams
- use anthropometric data for biomechanical calculations
- perform biomechanical calculations
- perform patient assessment
- select and provide appropriate intervention with regards to the user
- document performed actions and results according to existing legislation
- show familiarity with frequently used materials and equipment necessary in the production of prosthetic devices
- manufacture prosthetic devices according to regulations of occupational safety and health
- use appropriate outcome measures to evaluate prosthetic interventions
- show ability to communicate professionally with patients and colleagues.

Judgement and approach

- demonstrate empathy towards users and colleagues

- demonstrate an understanding for other health professions and their role in prosthetic interventions
- critically evaluate one's own performance.

Contents

Part 1, Biomechanics 7.5 credits

- basic surface anatomy
- functions of the musculoskeletal system
- normal gait biomechanics
- pathological gait biomechanics
- prosthetic biomechanics
- biomechanical calculations

Part 2, Transtibial Prosthetics 7.5 credits

- prostheses for trans-tibial amputations
- the rehabilitation process for patients, from needs analysis to finished product
- initial gait and mobility training with prosthetics
- current research and evidence within the subject area
- relevant laws and regulations when working with patients
- occupational health and safety
- work hygiene
- stump socket interface forces

Type of instruction

The course is implemented through lectures, group work, seminars and laboratory sessions including patient meetings.

The teaching is conducted in English.

Prerequisites

General entry requirements and completion of the courses Anatomy and physiology, Basic Course, 7.5 credits, Mechanics related to Prosthetics and Orthotics, 7.5 credits and Applied Materials Technology, 7.5 credits.

Examination and grades

The course is graded A, B, C, D, E, FX or F.

Part 1 is examined through one individual written exam and one group seminar.
Part 2 is examined through one individual written report and practical sessions with patient interaction.

A university lecturer serves as examiner for the course.

Registration of examination:

Name of the Test	Value	Grading

Individual written examination	6.5 credits	A/B/C/D/E/FX/F
Seminar	1 credit	U/G
Individual written assignment	6.5 credits	A/B/C/D/E/FX/F
Patient interaction	1 credit	U/G

Other information

Temporary interruption of a course

The School of Health and Welfare may suspend a student's participation in clinical training or other practical activities during the course if a student demonstrates gross unfitness/incompetence when applying skills. A student whose work-based training or other practical activities have been canceled due to gross inadequacy/incompetence may not continue study before the course director or examiner has verified and approved that the student has the knowledge and skills required. In connection with a decision on suspension, the decision will specify the grounds on which the suspension is based. After the decision, an individual plan will be established for the student where knowledge and skills gaps are specified, the degree of support the student is entitled to, and the terms and date(s) for examination(s).

Course literature

Behnke, R. S., & Plant, J. (2022). *Kinetic anatomy* (Fourth edition). Human Kinetics, Inc.

Chui, K. K., Jorge, M., Yen, S.-C., & Lusardi, M. M. (2020). *Orthotics and prosthetics in rehabilitation* (Fourth edition). Elsevier.

Krajbich, J. I., Pinzur, M. S., Potter, B. K., & Stevens, P. M. (2023). *Atlas of amputations and limb deficiencies?: surgical, prosthetic, and rehabilitation principles* (Fifth edition). AAOS.

McRae, R. (2010). *Clinical orthopaedic examination* (Sixth edition.). Churchill Livingstone.

The most recent editions of the course literature should be used.

Additional relevant journal articles will be used.