

Biomechanics and motor control

BIOMEKANIK OCH MOTORISK KONTROLL

15 credits - 15 högskolepoäng

Course code: MBBINK

Level: Master's level

Main Field of Study: Sport Science

Progressive specialization: A1N

Disciplinary Domain: Sports

Subject group: Sport Science

Established by: Utbildnings- och forskningsnämndens kursplaneutskott 2020-11-10

Version: 4

Valid from: Spring semester 2026

Entry requirements

The student should have 90 credits in sport science (or equivalent) including 20 credits in human biology or equivalent.

Intended learning outcomes

The student should be able to:

- Have a deep understanding of the methodology used in biomechanics and motor control, and be able to evaluate the advantages and disadvantages of various methods,
- Integrate and use knowledge to handle complex problems in biomechanics and motor control for sports and everyday movements,
- Demonstrate basic mathematical skills in order to analyze human movements.

Course content

The course includes studies in the following thematic areas:

- Basic mathematical and mechanical theory,
- Motor control of voluntary movements: From neuron to behaviour.
- Basic measurement and analysis methods for force, motion, nerve and muscle function,
- Application of results in relevant research areas, e.g. in sports and health.

The focus of the course is related to the research field, the use

Progression

The course includes studies at an advanced level, which means a deepening of knowledge in relation to undergraduate education level. This means an increased level of complexity and abstraction in theoretical application, higher demands on communication skills, discussion of problems and integration of knowledge and increased independence regarding the implementation of written deepening in a chosen field.

Examination

(P001) 15 hp, Biomekanik och motorisk kontroll, Tregradig skala
(P001) 15 credits, Biomechanics and motor control, Three-grade scale

Modes of assessment:

- Final written examination on the course curricula
- Written and oral presentation of a literature study
- Measurement in the laboratory and oral presentation.

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Course requirements

Attendance at literature review seminars is obligatory. Any absence will result in the student being given a supplementary writing task.

Grades

Possible grades include: Pass with Distinction, Pass or Fail. Students should expect to receive defined criteria at the commencement of the course. Grades will be reported to the study administrator no later than three weeks after the completion of the course.

To obtain a Pass as a final grade the student must receive a Pass for both the final examination, literature review and the measurement in the laboratory. To obtain a Pass with distinction as a final grade, the student must receive a Pass for the literature study and the measurement in the laboratory and a Pass with distinction in the written examination.

The examinations are held during the course as detailed in the course outline, which students should expect to receive at the beginning of the course. Re-examinations will be offered no sooner than three weeks after the student has received results of the original examination.

Reexaminations are held at the earliest three weeks after the completion of the relevant part of the course, before the start of the fall term and / or when the course is next offered.

Student influence and course evaluation

Student participation takes place through student representation in the institution management group.

After completion of the course each student will have the opportunity to evaluate the course and the lecturer will complete a self-evaluation. These evaluations will be returned to the student group and the examiner within 3 weeks.

Type of instruction

Teaching consists of lectures, seminars, laboratory sessions and demonstrations. The students shall individually perform a literature review within a chosen field. The literature reviews will be presented orally and discussed within the group. The students shall in pairs perform a measurement in the laboratory within a self-chosen area using at least one of the following

approaches: analyzing force, motion, nerve- or muscle function. The results and the analysis will be presented verbally within the group.

Teaching is in Swedish or English.

Other information

The course is offered as optional within the Masters program (MABIMO) and as an independent course (FID48A).

Literature and list of references

Compulsory literature and other study material:

Enoka, Roger, M. (2015). Neuromechanics of human movement, 5th ed. Champaign, Ill: Human Kinetics Publishers, Champaign, Ill: 496 s.

Robertson, G. et al. (red.) (2014). Research methods in biomechanics, 2nd ed. Human Kinetics Publishers, Champaign, Ill: 428 s.

Optional literature and other study material:

Ytterligare originalartiklar inom respektive temaområdena i samråd med kursens lärare (ca 100-150 s.).