Faculty of Medicine

BIMB43, Biomedicine: Pathophysiology, Pharmacology and Drug Development, 15 credits

Biomedicin: Patofysiologi, farmakologi och läkemedelsutveckling, 15 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by The Master's Programmes Board on 2023-09-19 to be valid from 2023-09-19, spring semester 2024.

General Information

The course is compulsory in the Biomedicine Programme and is included in semester 4.

Language of instruction: English

Main field of studies	*Depth of study relative to the degree requirements*
Biomedicine	G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

On completion of the course, the students shall be able to:

- account for the basic terminology, principles and mechanisms of action within general pathology and pharmacology,
- account for known and possible molecular, cellular and pathophysiological mechanisms and explain their relationship with organ system related diseases and disorders,
- explain basic pharmacodynamic, pharmacokinetic and toxicological principles,
- account for molecular, cellular and systemic consequences of existing and potential pharmacological interventions,
- account for the different stages of drug development from discovery to product,
- describe how scientific and analytical methods can be used to develop and

implement pharmacological interventions,
- explain how different organ systems are integrated and influenced by pathological conditions and pharmacological interventions.

Competence and skills
On completion of the course, the students shall be able to:

- search, review and compile research publications about pathophysiological and pharmacological mechanisms,
- analyse, evaluate and present scientific findings in pathophysiology, pharmacological and non-pharmacological interventions and drug development,
- act professionally in discussions about pathophysiology, pharmacology and drug development,
- review and give constructive feedback on another students' written assignment in the subject areas of the course and constructively use and answer feedback from their reviewer.

Judgement and approach
On completion of the course, the students shall be able to:

- reflect on how research and ethical issues impact pharmacological and non-pharmacological interventions,
- reflect on how environmental factors and socio-epidemiological factors influence disease development and interventions,
- reflect on how drug development and the use of drugs influence environment and health at the individual, local and global levels, and how this influences the possibilities to achieve the UN Global Goals,
- reflect on their own contributions and development and those of other group members to group assignments about pathophysiology and pharmacology.

Course content

Diseases that integrate physiology, cellular biology and molecular biology with pathophysiology and pharmacology are central to this course. The course aims to provide a comprehensive perspective on organ system related diseases, their complications and treatments at the molecular, cellular and systemic level. The course starts with a focus on basic pathophysiology at the cellular and molecular levels and an introduction to pharmacology with a focus on pharmacodynamics, pharmacokinetics and toxicology. The course covers various aspects such as pathophysiological mechanisms, pharmacological and non-pharmacological interventions, the mechanisms of the impact of drugs at the molecular, cellular and organ level and ethical considerations related to the UN Global Goals from a broad perspective. During the course, different parts of the drug development process are introduced – from the early pre-clinical stages to clinical trials and approval.

Course design

The working methods in the course mainly focus on active student learning, requiring student preparation prior to each teaching component. The students are expected to behave professionally and, just as in future work situations, participate constructively in the working groups to achieve progress. Group assignments are therefore compulsory and only in exceptional cases can complementary assignments be submitted instead.

The course combines lectures, individual preparation, applications and multiple choice questions. In order to achieve the specified skills and to practise attitudes and values, students work on applications in groups, which are presented and discussed.

In parallel to other course activities, an individual assignment in pathology and pharmacology is carried out, which constitutes the backbone to the course portfolio. In this work, the student specialises in pathophysiology and pharmacology and highlights this from perspectives relevant to the course. The student presents their work both orally and in writing. They train their ability to give feedback on the work of others in accordance with instructions and to respond to feedback on their own work.

In the context of all different learning components, students will read, review, evaluate and refer to scientific literature.

Assessment

The course has two examinations:

1. Multiple-choice questions, 5 credits.
   Grading scale:Fail, Pass.
2. Course portfolio 10 credits.
   Grading scale:Fail, Pass, Pass with Distinction. This examination comprises individual work that is presented in writing and orally, feedback on the written assignment by a fellow student, a written reflection and through active participation in group assignments.

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.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To achieve the grade of Pass as a final grade, the grade of Pass is required on all components. For the grade of Pass with Distinction as a final grade, students must also have been awarded the grade of Pass with Distinction on the course portfolio.

Entry requirements

Passed examinations and course components in the Biomedicine Programme's semesters 1-3, comprising at least 60 credits and completion of the course BIMB40 (Biomedicine: Organ Systems and Homeostasis of the Human Body).

Further information

This course replaces the previous courses BIMB41 and BIMB42.

Subcourses in BIMB43, Biomedicine: Pathophysiology, Pharmacology and Drug Development

Applies from V24

2401 Multiple-choice questions, 5,0 hp
Grading scale: Fail, Pass
2402 Course portfolio, 10,0 hp
Grading scale: Fail, Pass, Pass with distinction