



**LUND**  
UNIVERSITY

Faculty of Medicine

## **BIMB20, Biomedicine: Biochemistry and Cellular Metabolism, 7.5 credits**

*Biomedicin: Biokemi och cellulär metabolism, 7,5 högskolepoäng*  
First Cycle / Grundnivå

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### **Details of approval**

The syllabus was approved by The Master's Programmes Board on 2020-09-08 to be valid from 2020-09-15, spring semester 2021.

### **General Information**

The course is compulsory at the Bachelor's Programme in Biomedicine, and is included during semester 2.

*Language of instruction:* English

*Main field of studies*

Biomedicine

*Depth of study relative to the degree requirements*

G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

### **Learning outcomes**

#### **Knowledge and understanding**

On completion of the course, the student should be able to:

- account for the general function and regulation of enzymes with regards to 3D-structure, reaction rate, and environment,
- account for physiologically important carbohydrates and lipids and how differences in their chemical structures and bindings explain the biological effects,
- account for the general structure and biological importance of glycoproteins and proteoglycans,
- account for how different substrates are used and metabolized in cells,
- explain how energy is transferred in biological systems and the mechanisms behind cellular production of ATP,
- explain the mechanism behind biosynthesis, oxidation and metabolism of fatty acids and cholesterol, how these are transported and stored, and how they

- contribute to cellular function,
- account for how vitamins contribute to biological function and how deficiency of these can lead to disease,
- account for metabolic changes in cells in some common diseases.

### **Competence and skills**

On completion of the course, the student should be able to:

- apply regression analysis to receive  $K_m$ -,  $V_{max}$ -, and  $k_{cat}$ -values for the Michaelis-Menten equation,
- plan, carry out, document and summarize laboratory work, in writing, in a scientific way,
- extract content from research publications and summarize this in an oral presentation based on a given problem,
- statistically process and present data obtained from laboratory sessions and evaluate how data are presented in research publications.

### **Judgement and approach**

On completion of the course, the student should be able to:

- reflect on scientific issues in biochemistry and cellular metabolism from a social and ethical perspective,
- reflect on learning, individually and in groups, as well as on the own contribution to constructive feedback in order to improve the work of the group.

### **Course content**

The course covers basics of biochemistry and cellular metabolism. Specifically, the course aims to address questions around catabolism and anabolism, i.e. general principles for metabolism of intermediate products and energy. The functions of enzymes from an organic chemistry perspective will be highlighted. Special focus is put on regulation of enzymatic activity and on absorption and metabolism of nutrients such as carbohydrates, lipids and amino acids. The role of vitamins in health and disease is illustrated from a biochemical perspective.

### **Course design**

Throughout the course, the pedagogy strategy is centered at student-active learning, where students are prepared ahead of planned joint teaching activities. Laboratory experiments around biochemical problems are planned and carried out. The results are compiled in writing in the form of a scientific report. Research publications are reviewed and presented in groups with discussion and critical review around the contents. Included in the course is a seminar series that aims at identifying signs of mental illness as well as support and guide people who show such signs to adequate support. All group tuition, laboratory components, seminar series with a focus on mental health, and lectures that are associated with laboratory sessions are compulsory.

## Assessment

The examination consists of two different components.

1. Course portfolio 5 credits (Fail/Pass/Pass with distinction)
2. Multiple-choice questions 2.5 credits (Fail/Pass)

The course portfolio includes participation in group assignment, seminars and laboratory components, scientific report and presentations. Multiple-choice questions test knowledge and comprehension goals.

If there are special reasons, other forms of examination may apply.

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 Pass in final grade, all components should be approved. To achieve the grade Pass with distinction in the final grade, the scientific report in the course portfolio should achieve the grade Pass with distinction and the other components should achieve Pass.

## Entry requirements

The overview in BIMB10 or completed courses of at least 7.5 credits in cell biology and 7.5 credits in basic chemistry.

## Subcourses in BIMB20, Biomedicine: Biochemistry and Cellular Metabolism

Applies from V21

- 2101 Course portfolio, 5,0 hp  
Grading scale: Fail, Pass, Pass with distinction
- 2102 Multiple-choice questions, 2,5 hp  
Grading scale: Fail, Pass