



**LUND**  
UNIVERSITY

Faculty of Science

## **BIOR85, Biology: Immunology, 15 credits**

*Biologi: Immunologi, 15 högskolepoäng*

Second Cycle / Avancerad nivå

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### **Details of approval**

The syllabus was approved by Study programmes board, Faculty of Science on 2019-01-31 to be valid from 2019-01-31, autumn semester 2019.

### **General Information**

The course is an optional second-cycle course for a degree of Bachelor or Master of Science in Biology and Molecular Biology. The course is also offered as a single subject course. The language of instruction is English.

*Language of instruction:* English

*Main field of studies*

Biology

Molecular Biology

*Depth of study relative to the degree requirements*

A1N, Second cycle, has only first-cycle course/s as entry requirements

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### **Learning outcomes**

The aim of the course is that student should obtain an understanding of the immune system in mammals, primarily mice and humans, as well as practical and theoretical knowledge about a selection of immunological methods. During the course the students also practice to compile, analyze, report and discuss scientific material with immunological orientation. The course will prepare students for further studies at the master's level, mainly in molecular biology.

### **Knowledge and understanding**

On completion of the course the student shall be able to:

- describe and compare different components and processes in the immune system of mammals

- describe how the immune system protects against infections
- describe host-pathogen interactions and their consequences
- briefly describe immune-related diseases, vaccines and the evolution of immune systems
- account for basic immunological methods

### **Competence and skills**

On completion of the course the student shall be able to:

- apply a number of basic immunological methods, as well as interpret results from immunological studies based on these methods
- search and compile immunological literature (review articles and original articles)
- conduct written and oral reporting of material with immunological content, with particular regard to scientific content, language use, structure, figures, tables and reference management
- discuss immunological issues with adequate terminology, i.e. in level with the course literature plan
- plan and carry out work based on given time frames

### **Judgement and approach**

On completion of the course the student shall be able to:

- scientifically evaluate and assess the relevance of immunological results and immunological studies
- work in a group in a constructive and results oriented way
- reflect on others' work and provide constructive feedback on written and oral presentations with immunological content

### **Course content**

The course covers the structure and function of the immune system, as well as immunological processes at different levels (organism, organ, cell and molecular levels). The following topics are treated:

- Innate immunity, including e.g. anatomical barriers, cells, receptors, complement system.
- Antigen presentation
- Lymphocyte development and differentiation
- Antibody structure and function
- Defence against infection
- Infection biology
- Host-pathogen interactions
- Vaccine
- Mechanisms of immune-related diseases (autoimmunity, hypersensitivity)
- Evolution of immune systems in animals, as well as a selection of immunological methods (e.g. immunoblotting, flow cytometry, isolation and activation of immune cells, ELISA)

### **Course design**

The teaching consists of lectures, seminars, laboratory work and project work (literature project).

Theoretical knowledge is conveyed mainly through lectures and seminars. The seminars are conducted in groups where the students together solve and answer questions, and discuss the answers with a supervisor. The seminars are based on that all students participate actively in the discussion. Lectures and seminars complement each other since they partly cover different aspects of the theoretical course content.

During the laboratory sessions, various immunological methods are practiced. The laboratory work is carried out as group work and is reported in writing.

The course also includes a literature project on a well-defined topic within immunology. The project is based on scientific papers in immunology. The literature project is presented in writing and orally, with student opposition. An important aspect of this project work is to complete it within given time frames. During the course, a study visit is conducted to demonstrate different applications of immunology and to provide students with contacts for the future. Participation in laboratory work, project work and seminars and thus integrated other teaching is compulsory.

## Assessment

Examination takes place in the form of a written examination at the end of the course and by examination of compulsory components during the course. For students who have not passed the regular written examination, an additional examination in close connection to this is offered.

- Learning objectives regarding knowledge and understanding are mainly examined through written exam and project work
- Learning outcomes regarding competence and skills are examined through exercises, laboratory and project work
- Learning outcomes regarding judgement and approach are examined through seminars, laboratory work and project work

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 pass the entire course, approved examination, approved laboratory reports, approved project report, and approved participation in all compulsory components (laboratory sessions and seminars), are required. For the component laboratory work the scale is Fail and Pass. The final grade is decided through a weighing of the results on the written examination and the project work.

## **Entry requirements**

For admission to course is required knowledge equivalent to 90 credits of scientific studies including BIOA10 Cell- and Microbiology 15 credits, BIOA11 Genetics and Evolution 15 credits, Chemistry 15 credits, and BIOC01 Human Physiology 15 credits or BIOC12 Human and Animal Physiology 15 credits or BIOB02 Zoology 12 credits, are required. English 6/b.

## **Further information**

The course may not be included in a degree together with BIOR16 Immunology 15 credits.

## Subcourses in BIOR85, Biology: Immunology

Applies from H19

- 1901 Theory, 7,5 hp  
Grading scale: Fail, Pass, Pass with distinction
- 1902 Exercises and project, 4,5 hp  
Grading scale: Fail, Pass, Pass with distinction
- 1903 Laboratory Work, 3,0 hp  
Grading scale: Fail, Pass