LUND
UNIVERSITY

Faculty of Science

BIOR88, Biology: Immunology and Infection Biology, 15 credits

Biologi: Immunologi och infektionsbiologi, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2021-03-08 to be valid from 2021-03-08, autumn semester 2021.

General Information

The course is an elective first cycle component of a Bachelor or Master of Science degree in Biology or Molecular biology.

Language of instruction: English

Main field of studies	Depth of study relative to the degree requirements
Molecular Biology	A1F, Second cycle, has second-cycle course/s as entry requirements
Biology	A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

The aim of the course is that the student should have acquired knowledge, proficiencies and abilities on completion of the course concerning both pathogenic microorganisms and the function of the immune system at the molecular and cellular level, and understand host-pathogen interactions and infection processes from both a mechanistic and an evolutionary perspective. During the course, the students also practice to analyse and discuss scientific material focussed on immunology and infection biology.

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

- give an account of the structure, regulation and function of the immune system in mouse and man
- explain structure of different pathogenic microbes (viruses, bacteria, fungi and parasites) thoroughly
- give an account of basic epidemiological models and how natural selection influences both the immune defence and the virulence of pathogens
- give a detailed account of disease transmission and the principles for infection processes - including acute and chronic inflammatory phases
- give a detailed account of virulence mechanisms and the host-pathogen interactions that lead to that pathogenic microorganisms avoid protecting immunity
- give an account of structure and function of vaccine
- describe how antibiotics function
- describe disease control and the global influence of infectious diseases

Competence and skills

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

- independently analyse genetic variation and gene expression of genes with relevance for the host-pathogen interactions
- critically discuss infectious diseases from a microbial, immunological and evolutionary perspective
- critically discuss vaccine and treatment from a microbial, immunological and evolutionary perspective
- carry out written and oral reporting of material within the subject areas of immunology and infection biology, with special consideration to scientific content and language
- plan and carry out tasks within given time frames

Judgement and approach

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

- critically review and evaluate literature in the subject area
- apply their knowledge in collaboration with others to constructively analyse complex problems within the subject area
- evaluate their knowledge in relation to research and work in science, industry and public authorities
- reflect on the importance of infectious diseases for disease control and global health

Course content

The course consists of three modules: a theoretical part that includes 7.5 credits, a seminar part that includes 6 credits and exercises with computer-based laboratory sessions that include 1.5 credits. The course covers pathogenic microorganisms, the function of the immune system, host-pathogen interactions and infection processes from a mechanistic and an evolutionary perspective. The following subjects are treated:

- Innate and adaptive immunity
- Inflammation
- Medical Microbiology
- Epidemiology and evolution
- The immunology of system

- Vaccine and treatment
- Disease control and global health

Course design

Module Theory (7.5 credits): Teaching consists of lectures

Module Seminars (6 credits): The teaching consists of case-based seminars and article seminars, where relevant literature is treated. The students orally present cases and articles and participate in a discussion around these. Active participation in seminars is compulsory.

Module Exercises (1.5 credits): Teaching consists of computer-based exercises that the students present in the form of laboratory reports. Active participation in exercises is compulsory.

Assessment

The assessment is based on the written performance of students in a an exam at the end of the course, and through participation in compulsory components during the course. Students who do not pass an assessment will be offered another opportunity for assessment soon thereafter.

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.
For a grade of Pass on the whole course, the student must have passed the exam and the compulsory parts.

Grade on module Theory 7.5 is Fail, Pass, Pass with distinction. Grade on module Seminars 6 credits are Fail, Pass. Grade on module Exercises 1.5 credits are Fail, Pass. The final grade is based on the written examination.

Entry requirements

To be admitted to the course, students must have 135 ECTS credits in Natural Science studies, including knowledge corresponding to BIOR85 Immunology 15 credits, cell- and molecular biology and/or biochemistry 30 credits, genetics 5 credits, microbiology 5 credits, human -/animal physiology 15 credits and chemistry 15 credits. English 6/English B.

Subcourses in BIOR88, Biology: Immunology and Infection Biology

Applies from H21

2101 Theory, 7,5 hp
       Grading scale: Fail, Pass, Pass with distinction
2102 Seminars and Exercises, 6,0 hp
       Grading scale: Fail, Pass
2103 Exercises, 1,5 hp
       Grading scale: Fail, Pass