



BB2446 Immunology 7.5 credits

Immunologi

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

The official course syllabus is valid from spring semester 2027 as decided by the Director of First and Second Cycle Education. Decision date: 2026-09-10

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Biotechnology

Specific prerequisites

Completed degree project 15 credits, 20 credits in biochemistry, microbiology and genetics/molecular biology. 20 higher education credits (hp) chemistry. English B/ 6.

Intended learning outcomes

The course provides a fundamental understanding of the structure, function and role of the immune system in health and disease, with relevance to biotechnological and biomedical applications.

At the end of the course, the student shall be able to:

- Describe the cells and organs of the immune system and explain the structure and function of key immune molecules, including immunoglobulins, major histocompatibility complex molecules, T-cell receptors, cytokines and complement components.
- Demonstrate detailed understanding of innate and acquired immunity, including immunogenicity of different antigens, antigen recognition, antigen processing and antigen presentation.
 - Explain central processes in immunology, including T-cell activation, maturation and differentiation, generation of the humoral immune response, cell-mediated immunity, and the action and regulation of the complement system.
- Describe and discuss the immunological basis of major disease conditions, including autoimmunity, allergy, hypersensitivity reactions, infectious diseases and immunodeficiencies.
- Describe the basis for vaccination.
- Demonstrate the ability to combine knowledge of different immunological principles to reason about how an immune response arises, for example how a vaccine can be designed or how monoclonal antibodies with desired specificity can be produced.
- Discuss how immunological knowledge can be applied in research and medicine.

Course contents

The course provides theoretical knowledge of the structure and function of the immune system, including innate and adaptive immunity, the development and activation of B and T cells, clonal selection, generation of receptor diversity, antigen recognition, T-cell-mediated immunity, humoral immunity, cytokine signaling and the complement system, as well as central immune molecules such as antibodies, T-cell receptors and MHC molecules.

The course also covers immune responses to infection, principles of vaccination, transplantation, and examples of immune dysfunction, including autoimmunity, allergy, hypersensitivity reactions and immunodeficiency. In addition, the course introduces how the immune system can be studied and manipulated in research and medicine.

The course includes a practical laboratory component that introduces examples of how immunological knowledge can be generated, interpreted and applied in biomedical research.

Examination

- TEN2 - Written exam, 6.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory work, 1.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

The examination is based on the intended learning outcomes and covers content addressed in lectures, and the course literature. The intended learning outcomes and the level of knowledge required to achieve them are further clarified and contextualized during the lectures.

Other requirements for final grade

Attendance and active participation in the laboratory work are compulsory for a passing grade.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.