BIMA37 Microbiology and immunology

13.5 higher education credits
First cycle

General Information

Main field
Biomedicine

Subject
Microbiology and immunology

Type of course
The course is mandatory in the Bachelor of Medical Science in Biomedicine programme and is taught in term 3.

Language of instruction
Swedish

Learning Outcomes

Knowledge and understanding
On completion of the course, students shall be able to
- provide an account of different protective barriers and explain how blood cells are formed, how they communicate and function as a protection against microbial infections
- provide an account of how cellular as well as soluble components in the immune system act to create acute phase response, inflammation and fever
- provide an account of how an immunological memory is created, how specificity of the immune system is achieved and explain how and why tolerance develops
- provide an account of construction of basic bacterial structures and provide examples of processes where bacteria cause infection in the human being
- provide an account of construction of basic viral structures and provide examples of processes where virus cause infection in the human being
- provide an account of construction of different parasite structures and processes where parasites cause infection in the human being
- provide an account of how the development of hypersensitivity and susceptibility to infections varies with heredity and environment.
Skills and abilities
On completion of the course, students shall be able to
- present, orally and in writing, immunological and microbiological issues and discuss them
- carry out and summarize in writing basal immunological and microbiological laboratory techniques and to calculate parameters such as sensitivity, specificity and variation coefficients.

Judgment and approach
On completion of the course, students shall be able to
- evaluate and critically examine immunological and microbiological information coming from mass media such as television, newspapers, podcast, blogs and websites.

Course Contents
The purpose of this course is to provide a solid basic knowledge of microbiology and immunology. The focus is on cellular and molecular level. The first week will begin with “Basic blood cell biology and immune cell communication.” This is followed by weekly themes with “Innate Immunity and Inflammation”, “Acquired Immunity and Tolerance”, “Hypersensitivity”, “Basic Bacteriology” Basic Virology”, “Basic Parasitology”, and finally “Susceptibility to Infection”.

Test Elements
Written examination: 10,0 hp
Laboratory sessions: 2,0 hp
Individual work: 1,5 hp

Instruction and Examination
Instruction takes place through mandatory group work (PBL), lectures and mandatory laboratory sessions. Case methodology might be used as a reflection in the context of laboratory work or as an exercise in evaluating and critical examining of mass media reports related to microbiology and/or immunology.

Four laboratory sessions are linked to immunological and microbiological issues. Microscope exercises on blood cells, bacteria and parasites visualize cells and organisms. In vitro production of antigen and antibody assays followed by work with statistical software give training in relevant techniques and method evaluation. Cultivation and identification of bacteria provide insight into how basic microbiological work is functioning and how risk assessment is an important part in this.
A written exam at the end of the course examines the expected learning outcomes in terms of knowledge, understanding, judgement and approach. Two laboratory reports (one on Immunology and one on Microbiology) should be designed in the scientific article format and presented in writing. Individual work in Microbiology and/or Immunology will be presented orally and in writing in a small group in which skills and abilities will be examined.

**Grades**

The grades awarded are Pass or Fail.

**Admission Requirements**

15 hp chemistry, 15 hp cell chemistry/biochemistry and 15 hp cell biology.

**Literature**

One of the three following books on Immunology is recommended.
- Kuby Immunology, (latest ed.) by Kindt, Goldsby and Osborne
- Basic Immunology, (latest ed.) by Abbas and Lichtman
- Grundläggande immunologi, (latest ed.) by Brändén och Andersson

Recommended book on Microbiology

**Further Information**

This course replaces BIMA31.