

## General microbiology (J000403)

Course size (nominal values; actual values may depend on programme)

Credits	7.0	Study time	210 h	Contact hrs	75.0 h
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Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	Dutch	practicum	45.0 h
		lecture	30.0 h

Lecturers in academic year 2018-2019

Coenye, Tom	FW02	lecturer-in-charge
Crabbé, Aurélie	FW02	co-lecturer

Offered in the following programmes in 2018-2019

<a href="#">Bachelor of Science in Pharmaceutical Sciences</a>	crdts	offering
	7	A

Teaching languages

Dutch

Keywords

Microbiology, bacteriology, virology, mycology, infectious diseases, antibiotics, disinfection, sterilisation.

Position of the course

This course highlights the diversity of micro-organisms and their adaptation to multiple environments, particularly a human host. The emphasis of this course is on medico-pharmaceutical aspects, including the pathogenesis of infectious diseases, mechanisms of action of antimicrobial chemotherapeutics and resistance development by microorganisms. Other courses in the pharmacy curriculum are not directly concerned with micro-organisms. Conversely, the course on microbiology does cover aspects (e.g. on metabolism, infectious diseases, antibiotics, molecular biology, immunology) of other courses, including biochemistry and biophysics, animal cell biology and histology, pathology, medical biochemistry, medicinal chemistry, pharmaceutical biotechnology, pharmacology and immunology.

Contents

The first part of the course is concerned with the morphology (structure), the metabolism, the growth and the molecular biology of bacteria, viruses, fungi and protozoans. The applied medical section starts with a chapter on identification of microorganisms. In addition, the commensal human flora, different steps in the infection process, important classes of virulence factors and the role of the host defense mechanisms are briefly discussed. The role of opportunistic human pathogens will be discussed. Medical microbiology is approached from the perspective the pharmacist on infectious diseases (respiratory, gastro-intestinal,...) instead of on the basis of the etiologic agents. A second part in the applied medical section deals with sterilisation, disinfection and antimicrobial chemotherapy, with emphasis on the mode of action of antibiotics and the genetic and biochemical basis of acquired resistance.

Initial competences

Having successfully completed courses in Animal cell biology and histology, Botanical biology, Biochemistry and biophysics I, Biochemistry and biophysics II, Pathology, and Pharmacokinetics, or having acquired the corresponding competences in another way.

Final competences

- 1 To integrate the knowledge of the morphology, metabolism, growth and molecular biology of microorganisms.
- 2 To understand the importance of accurate identification of microorganisms and to

- understand the methods that are used for this.
- 3 To understand the issue of infectious diseases with reference to the knowledge of the general microbiology.
  - 4 To put aspects of pathogenesis, pathology, prevention and epidemiology of infectious diseases in a pharmaceutical context.
  - 5 To understand the action of antimicrobials and the resistance mechanisms of microorganisms, based on the knowledge of their morphology, metabolism and molecular biology.
  - 6 To have insight into the problems associated with antimicrobial resistance.
  - 7 To advise patients about micro-organisms and infectious diseases.
  - 8 To master the basic skills and techniques of a microbiological laboratory.
  - 9 To communicate and work in a team of students performing microbiological laboratory experiments.
  - 10 To write a report on the results of microbiological laboratory experiments.

#### Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

#### Conditions for exam contract

This course unit cannot be taken via an exam contract

#### Teaching methods

Lecture, practicum

#### Extra information on the teaching methods

Lectures + practical classes (laboratory exercises).

#### Learning materials and price

Theory : schemes + illustrations taken from PowerPoint presentation (Dutch and English) are available (free of charge) via the electronic learning platform Minerva. Laboratory manual for the practical course (in Dutch) is available (free of charge) via the electronic learning platform Minerva.

#### References

Extra information can be found in Madigan, et al., Brock Biology of Microorganisms, 13th Edition (Pearsson). Additional material for study (for example scientific publications) will be made available through the electronic learning platform Minerva.

#### Course content-related study coaching

Students have different possibilities to ask questions, both individually and in group: before or after the classes, or on appointment. Questions can also be asked via e-mail but these questions will be answered in the next class. Questions that will be asked less than two weeks before the exam will not be answered anymore.

#### Evaluation methods

end-of-term evaluation and continuous assessment

#### Examination methods in case of periodic evaluation during the first examination period

Written examination with open questions

#### Examination methods in case of periodic evaluation during the second examination period

Written examination with open questions

#### Examination methods in case of permanent evaluation

Participation, skills test, report

#### Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

#### Extra information on the examination methods

**Theory:** periodic (end of term). First and second examination period : written examination.

**Practical classes :** permanent (in the course of the classes). The marks for practicum are based on the evaluation of the results of the laboratory exercises (reports), the daily work (preparation of the exercises, quality of the preparations and cultures, attitude in the laboratory) and the technical skills of the student. The exam in the second examination period involves a laboratory exercise, running over two days and concluded by a verbal explanation about the exercise in question. Students who are legitimately absent on certain days during the laboratory term need to make up the missed exercise(s) at a later moment. Illegitimate absence from a practical class and/or the exam leads to a total score (theory + practicum) of maximally 6/20, irrespective of the score for theory.

### Calculation of the examination mark

In order to pass the complete course the student has to pass both parts (theory and practicum). In that case the final score is calculated as follows :

Final score = marks for theory plus a bonus, depending on the marks for practicum (/20) :

Marks

practicum	Bonus (points)
12-13.9 :	1
14-15.9 :	1,5
16-20 :	2

If the student does not succeed for the two parts (practicum + theory) separately, a maximum score of 9/20 can be obtained.

### **Transfer of examination results to the second examination period from the same academic year**

- If a student passes the evaluation part continuous assessment in the first examination period, he/she must not repeat this part during the second examination period.

In case a student did not succeed for the whole course unit, he/she can however make use of the full second exam opportunity; considering the last obtained marks will count in the calculation of the final examination mark.