Mathematics (J000375)

Valid as from the academic year 2018-2019

Course Specifications

Lecturers in academic year 2018-2019
Braeckmans, Kevin
FW01 lecturer-in-charge

Course offerings and teaching methods in academic year 2018-2019

A (semester 1) Dutch
- guided self-study 6.25 h
- seminar: coached 11.25 h
- exercises
- lecture 23.75 h
- group work 11.25 h

Offered in the following programmes in 2018-2019
Bachelor of Science in Pharmaceutical Sciences

Credits 4.0
Study time 120 h
Contact hrs 52.5 h

Teaching languages
Dutch

Keywords
Mathematics

Position of the course
One could consider mathematics being the language of nature. It provides for a universal way to describe natural processes, as well as the interaction and relation between elements. It is, therefore, a prerequisite in many scientific fields to have a proper knowledge of mathematics in order to understand, to predict and to communicate nature’s working mechanisms. Mathematics in the context of Pharmaceutical Sciences is rather a tool instead of an aim in itself. The emphasis of this course lays on a practical working knowledge of mathematical principles. Furthermore, an insightful and critical way of thinking, here within a mathematical context, contributes to the education of new young scientists.

Contents
1. Numbers, variables and units
2. Algebraic functions
3. Transcendental functions
4. Differentiation
5. Integration
6. Methods of integration
7. Sequences and series
8. Functions of several variables
9. First-order differential equations
10. Vectors
11. Determinants
12. Matrices and linear transformations

Initial competences
Final competences of secondary school or competences corresponding herewith.
Limited prior knowledge is expected, in particular with respect to:
- Arithmetic (the set of real numbers, algebraïc operations on real numbers, properties of the basic operations, ...).
- Solving of equations (linear equations in one variable, substitution method and combination method for systems of two equations in two variables).
- Properties of basic functions: polynomial functions, rational functions, transcendent

(Approved)
functions (trigonometric functions, exponential and logarithmic functions)
- Application of trigonometric formulas

Final competences
1. Knowledge of the basic principles of algebra and calculus of real numbers and functions
2. Being able to relate mathematical principles between chapters and to apply them in exercises.
3. Being able to apply the mathematical principles from Algebra and Calculus in exercises.
4. Being able to translate textual problems into mathematical models.
5. Being able to formulate the solution of a mathematical problem in a correct and unambiguous way.
6. Logical and abstract reasoning

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
Guided self-study, group work, lecture, seminar: coached exercises

Extra information on the teaching methods
Lectures are mostly used to teach the mathematics theory. Some parts are made available through a self-study trajectory. Exercises have to be prepared beforehand with the aid of the solutions manual. An online platform is available to indicate which exercises need further explanation. Based on this input seminars will be organized consisting of two parts. The first part is a plenary session in which the most common questions will be addressed. The second part is based on 'peer-tutoring', in which the remaining questions can be discussed in small groups of students.

Learning materials and price
As course material the following handbook will be used:
Full solutions to the exercises are available online. Estimated price: 55 euro.
Lecture slides in Dutch will also be made available.
Screencasts are also available for the self-study parts of the theory.

References
Course content-related study coaching
Students have several opportunities to ask questions to the lecturer before and right after the lectures. If necessary, an appointment can be made with the lecturer by phone (09/264.80.98) or e-mail (kevin.braeckmans@UGent.be). Furthermore, there is the possibility to ask questions during the seminars, especially during the peer-tutoring part.

Evaluation methods
- end-of-term evaluation and continuous assessment

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

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

Examination methods in case of permanent evaluation
Peer assessment

Possibilities of retake in case of permanent evaluation
not applicable

Extra information on the examination methods
The written exam consists of multiple choice and open questions.
In addition, the peer-tutoring sessions are subject to peer-evaluation based on attitude, commitment and preparation. These points give a bonus advantage for the written exam.

Calculation of the examination mark
Written exam: S1/20
Peer-evaluation: S2/2

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Final score (out of 20): $\frac{S1}{20}*(20-S2)+S2$