Course Specifications
Valid in the academic year 2018-2019

Mathematics III (I700118)

Course offerings and teaching methods in academic year 2018-2019

<table>
<thead>
<tr>
<th>A (semester 1)</th>
<th>Dutch</th>
</tr>
</thead>
<tbody>
<tr>
<td>lecture</td>
<td>16.0 h</td>
</tr>
<tr>
<td>seminar: practical PC room classes</td>
<td>8.0 h</td>
</tr>
<tr>
<td>seminar: coached exercises</td>
<td>12.0 h</td>
</tr>
</tbody>
</table>

Lecturers in academic year 2018-2019

Baetens, Jan
LA26 lecturer-in-charge

Offered in the following programmes in 2018-2019

| Bachelor of Science in Bioscience Engineering Technology | 4 | A |

Teaching languages

Dutch

Keywords

Ordinary differential equations, analytical methods, numerical methods, equilibrium, stability, modelling, systems of differential equations, Python, Mathematica

Position of the course

This course unit provides a basis for engineering courses in which mathematical models are developed and used since such models are often based on differential equations. The students gets acquainted with systems of (non)linear differential equations and becomes skilled in solving differential equations both analytically and numerically. In addition, the student gains insight into how differential equations can be used to describe biological and natural processes.

Contents


Initial competences

Mathematics I. Moreover, Mathematics III builds on certain learning outcomes of Mathematics II, and Informatics I; or the learning outcomes have been achieved differently

Final competences

1. Recognize various types of differential equations
2. Apply analytical solution techniques
3. Conduct qualitative analyses of (systems of) differential equations
4. Implement and apply numerical solution methods for differential equations using Python
5. Use Mathematica to solve (systems of) differential equations analytically.

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

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

<table>
<thead>
<tr>
<th>Credits</th>
<th>Study time</th>
<th>Contact hrs</th>
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</thead>
<tbody>
<tr>
<td>4.0</td>
<td>110 h</td>
<td>36.0 h</td>
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(Approved) 1
Teaching methods

Lecture, seminar: coached exercises, seminar: practical PC room classes

Extra information on the teaching methods

During the lectures important concepts and properties are introduced, which form the starting point for solving problems during the seminars.

Learning materials and price

Lecture notes with worked examples and exercises

References


Course content-related study coaching

The lecturer answers questions concerning the theory upon appointment and before and after the lectures, the teaching assistants are available for questions related to the exercises and practical sessions, interactive support via Minerva.

Evaluation methods

end-of-term evaluation

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

Written examination with open questions, open book examination

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

Written examination with open questions, open book examination

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation

examination during the second examination period is not possible

Extra information on the examination methods

The exam consists of exercises and questions of a more theoretical nature.

Calculation of the examination mark

(Approved)