**Module description**

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<th>Module title</th>
<th>Abbreviation</th>
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<tr>
<td>Ordinary Differential Equations and Complex Analysis</td>
<td>10-M-DFT-082-m01</td>
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**Module coordinator**
Dean of Studies Mathematik (Mathematics)

**Module offered by**
Institute of Mathematics

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<th>ECTS</th>
<th>Method of grading</th>
<th>Other prerequisites</th>
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<td>13</td>
<td>numerical grade</td>
<td>Only after succ. compl. of module(s)</td>
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**Duration**
2 semester

**Module level**
undergraduate

**Contents**
Existence and uniqueness theorems on solutions of ordinary differential equations, solution theorems on systems of linear differential equations, introduction to the problem of systems of nonlinear differential equations, basic notions in the qualitative theory of ordinary differential equations, basic properties of holomorphic functions, meromorphic functions and conformal maps, basic proof methods in differential equations and complex analysis, applications in computer science, physics, engineering science and other fields of mathematics.

**Intended learning outcomes**
The student is acquainted with the fundamental concepts and methods of the theory of ordinary differential equations and holomorphic functions. He/she is able to interconnect these concepts and realises the advantages of thinking across the borders of different branches in mathematics.

**Courses**
This module comprises 3 module components. Information on courses will be listed separately for each module component.

- **10-M-DFT-1-082**: V + Ü (no information on SWS (weekly contact hours) and course language available)
- **10-M-DFT-2-082**: V + Ü (no information on SWS (weekly contact hours) and course language available)
- **10-M-DFT-P-082**: M (no information on SWS (weekly contact hours) and course language available)

**Method of assessment**
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.

**Assessment in module component 10-M-DFT-1-082**: Ordinary Differential Equations

- 4 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

**Assessment in module component 10-M-DFT-2-082**: Introduction to Complex Analysis

- 7 ECTS, Method of grading: (not) successfully completed
- written examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)
Language of assessment: German, English if agreed upon with the examiner

Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-DFT-P-082: Examination in Ordinary Differential Equations and Complex Analysis

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of module component 10-M-DFT-1 or module component 10-M-DFT-2 is a prerequisite for participation in module component 10-M-DFT-P.

Allocation of places

Additional information

Referred to in LPO I (examination regulations for teaching-degree programmes)

§ 73 (1) 1. Mathematik Analysis

Module appears in

| Bachelor's degree (1 major) Mathematics (2008) |
| Bachelor's degree (1 major) Economathematics (2009) |
| Bachelor's degree (1 major) Economathematics (2008) |
| Bachelor's degree (1 major) Mathematical Physics (2009) |
| Bachelor's degree (1 major) Computational Mathematics (2009) |
| Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008) |
| First state examination for the teaching degree Gymnasium Mathematics (2009) |