| **Georg-August-Universität Göttingen**<br>**Module B.Mat.3112: Introduction to analysis of partial differential equations** | 9 C<br>6 WLH |
|---|---|

**Learning outcome, core skills:**
**Learning outcome:**

The successful completion of modules of the cycle "Analysis of partial differential equations" enables students to learn methods, concepts, theories and applications in the area "Analysis of partial differential equations". During the course of the cycle students will be successively introduced to current research topics and able to carry out independent contributions to research (e. g. within the scope of a Master's thesis). Depending on the current course offer the following content-related competencies may be pursued. Students

- are familiar with the most important types of partial differential equations and know their solutions;
- master the Fourier transform and other techniques of the harmonic analysis to analyse partial differential equations;
- are familiar with the theory of generalized functions and the theory of function spaces and use these for solving differential partial equations;
- apply the basic principles of functional analysis to the solution of partial different equations;
- use different theorems of function theory for solving partial different equations;
- master different asymptotic techniques to study characteristics of the solutions of partial different equations;
- are paradigmatically familiar with broader application areas of linear theory of partial different equations;
- are paradigmatically familiar with broader application areas of non-linear theory of partial different equations;
- know the importance of partial different equations in the modelling in natural and engineering sciences;
- master some advanced application areas like parts of microlocal analysis or parts of algebraic analysis.

**Core skills:**

After having successfully completed the module, students will be able to

- discuss basic concepts of the area "Analysis of partial different equations";
- explain basic ideas of proof in the area "Analysis of partial different equations";
- illustrate typical applications in the area "Analysis of partial different equations".

**Workload:**
Attendance time: 84 h
Self-study time: 186 h

| **Course:** B.Mat.3112.Lec **Lecture course** (Lecture) | 4 WLH |
|---|---|
| **Examination: Written or oral examwritten examination (120 minutes) or oral examination (appr. 20 minutes)**<br>B.Mat.3112.Mp: Introduction to analysis of partial differential equations<br>**Examination prerequisites:** | 9 C |

| | |
|---|---|
| B.Mat.3112.Ue: Achievement of at least 50% of the exercise points and presentation, twice, of solutions in the exercise sessions | |

| | |
|---|---|
| **Course:** B.Mat.3112.Ex **Exercise session** (Exercise) | 2 WLH |

| | |
|---|---|
| **Examination requirements:**<br>Proof of knowledge and mastery of basic competencies in the area "Analysis of partial differential equations" | |

| | |
|---|---|
| **Admission requirements:**<br>none | **Recommended previous knowledge:**<br>B.Mat.1100, B.Mat.1200 |
| **Language:**<br>English | **Person responsible for module:**<br>Dean of studies |
| **Course frequency:**<br>not specified | **Duration:**<br>1 semester[s] |
| **Number of repeat examinations permitted:**<br>twice | **Recommended semester:**<br>Bachelor: 5 - 6; Master: 1 - 4 |
| **Maximum number of students:**<br>not limited | |

**Additional notes and regulations:**
**Instructor:** Lecturers at the Mathematical Institute