# Module Description

## Module Title
Quantum Transport

## Abbreviation
11-QTH-161-m01

## Module Coordinator
Managing Director of the Institute of Applied Physics

## Module Offered By
Faculty of Physics and Astronomy

## ECTS
6

## Method of Grading
Numerical grade

## Duration
1 semester

## Module Level
Graduate

## Other Prerequisites
--

## Contents
The lecture addresses the fundamental transport phenomena of electrons in nanostructures. This includes the topics of: ballistic and diffuse transport, electron interference effects, quantisation of conductivity, interaction phenomena between electrons, Coulomb blockade, thermoelectric properties, description of spin-dependent transport phenomena, topological insulators, solid-state quantum computers.

## Intended Learning Outcomes
The students have mastered the basics of electronics of nanostructures in theory and practice. They know functions and applications of respective components.

## Courses

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of Weekly Contact Hours</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>3</td>
<td>German or English</td>
</tr>
<tr>
<td>R</td>
<td>1</td>
<td>German or English</td>
</tr>
</tbody>
</table>

## Method of Assessment

- Written examination (approx. 90 to 120 minutes) or oral examination of one candidate each (approx. 30 minutes) or oral examination in groups (groups of 2, approx. 30 minutes per candidate) or project report (approx. 8 to 10 pages) or presentation/talk (approx. 30 minutes).

If a written examination was chosen as method of assessment, this may be changed and assessment may instead take the form of an oral examination of one candidate each or an oral examination in groups. If the method of assessment is changed, the lecturer must inform students about this by four weeks prior to the original examination date at the latest.

## Allocation of Places
--

## Additional Information
--

## Referred to in LPO I (Examination Regulations for Teaching-Degree Programmes)
--

## Module Appears In
- Master's degree (1 major) Mathematics (2016)
- Master's degree (1 major) Physics (2016)
- Master's degree (1 major) Nanostructure Technology (2016)
- Master's degree (1 major) Computational Mathematics (2016)
- Master's degree (1 major) Functional Materials (2016)
- Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)
- Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)
- Master's degree (1 major) Computational Mathematics (2019)
- Master's degree (1 major) Mathematics (2019)