**Module title** | **Abbreviation**  
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Linear Algebra 1 for Mathematical Physics | 10-M-LNAP1-202-m01  

**Module coordinator** | **Module offered by**  
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Dean of Studies Mathematik (Mathematics) | Institute of Mathematics  

<table>
<thead>
<tr>
<th><strong>ECTS</strong></th>
<th><strong>Method of grading</strong></th>
<th><strong>Only after succ. compl. of module(s)</strong></th>
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<tr>
<td>5</td>
<td>(not) successfully completed</td>
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<tr>
<th><strong>Duration</strong></th>
<th><strong>Module level</strong></th>
<th><strong>Other prerequisites</strong></th>
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<td>1 semester</td>
<td>undergraduate</td>
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**Contents**

Basic notions and structures: groups, rings, fields, polynomials; matrices: Gauß algorithm, echelon form, rank; vector spaces over arbitrary fields: linear independance, basis, dimension, coordinates, change of basis, sums, direct sums and quotients of subspaces, linear maps, kernel and image, dimension theorem, matrix representation, determinants.

**Intended learning outcomes**

The student knows and masters the basic notions and essential methods of linear algebra. He/She is acquainted with the central proof methods in linear algebra and can apply them to solve easy problems. He/She is able to perform simple mathematical arguments independently, and can present them adequately in written form.

**Courses** (type, number of weekly contact hours, language — if other than German)

Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 90 to 180 minutes) and written exercises (approx. 12 exercise sheets with approx. 4 exercises each)  
Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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

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**Module appears in**

Bachelor’ degree (1 major) Mathematical Physics (2020)