


Data:	AlassCod. MA. / Examination number: -	Version: 16.07.2024 	Start Year: SoSe
Module Name:	<b>AI-assisted Programming in Computational Materials and Mechanics</b>		
(English):			
Responsible:	<a href="#">Eidel, Bernhard / Prof. Dr.-Ing. habil.</a>		
Lecturer(s):	<a href="#">Eidel, Bernhard / Prof. Dr.-Ing. habil.</a>		
Institute(s):	<a href="#">Institute of Mechanics and Fluid Dynamics</a>		
Duration:	1 Semester(s)		
Competencies:	<p>Students are able to identify, evaluate and use resources for a programming project in the WWW. They learn to use latest AI-assistants to generate, test and improve computer codes in Python. Students learn to apply these competencies in a coding project individually assigned by the Lecturer.</p> <p>Students learn to write a report about their coding project following scientific standards in structure, content and style. They learn to present and defend their results.</p>		
Contents:	<p>Most important ingredients are:</p> <ul style="list-style-type: none"> <li>• Learning effective search strategies for resources in the WWW (literature, computer codes, datasets, AI-tools, etc.)</li> <li>• Analysis of the model equations and a solution method for problems of mechanics/materials science/physics</li> <li>• Prompt Engineering for Code generation in Python by a Chatbot or alternative coding assistants</li> <li>• Code assessment – tests for verification of the generated code. Bug detection/fixing. Analysis of strengths and weaknesses of the AI-based coding assistants</li> <li>• Writing a scientific report in LaTeX about the coding project</li> <li>• Presentation and defense of the project</li> </ul>		
Literature:			
Types of Teaching:	S1 (SS): Lectures (2 SWS) S1 (SS): Exercises (2 SWS)		
Pre-requisites:	<b>Mandatory:</b> <a href="#">Introduction to Scientific Programming, 2017-05-18</a> <a href="#">Software Tools for Computational Materials Scientists, 2024-07-16</a> <a href="#">Numerical Analysis of Differential Equations, 2024-01-29</a>		
Frequency:	yearly in the summer semester		
Requirements for Credit Points:	<p>For the award of credit points it is necessary to pass the module exam. The module exam contains:</p> <p>AP: Individual AI-assisted coding project with report</p> <p>Voraussetzung für die Vergabe von Leistungspunkten ist das Bestehen der Modulprüfung. Die Modulprüfung umfasst:</p> <p>AP: Individuelles KI-assistierte Programmier-Projekt mit Bericht</p>		
Credit Points:	5		
Grade:	<p>The Grade is generated from the examination result(s) with the following weights (w):</p> <p>AP: Individual AI-assisted coding project with report [w: 1]</p>		
Workload:	The workload is 150h. It is the result of 60h attendance and 90h self-studies.		