Valid from 2025.HS

Module description: Project Module 4

Module Code	t.BA.MT.PM4.19HS
ECTS Credits	4
Language of Instruction/Examination	German
Organizational Unit	IPP
Module Coordinator	Frank Huber
Legal Framework	The module description is part of the legal basis in addition to the general academic regulations. It is binding. During the first week of the semester a written and communicated supplement can specify the module description in more detail.
Module Characteristic	Type 4* 4 lab lessons per semester week and half-class
Module Description	In project module 4, students develop and test solutions in a team to a practical problem relating to fluid mechanics, the strength of materials, sheet metal fabrication and mechanical engineering. Creative work, research, presentation, documentation and communication are all promoted.
Module Content	**IPP** • Task clarification and idea search • Review • Concept and detail design of a sheet metal assembly • Bending simulation • Cost calculation **IEFE** • Design of a pump for a predefined operating point • Printing of the parts at IPP (Impeller, volute, etc.) • Experimental testing of the pump on the IEFE test rig • Redesign resp. optimisation of the pump parts • Preparation of a final report **IMES** • Dimensioning of the impeller of the pump and its housing • Compilation of a design specification • Creation of FE models reflecting the respective project stages • Compilation of a proof of strength «to the attention of an authority» **ILC** • The setting of team objectives and definition of roles • Presentation technique for scientific/technical presentations in English • Management summary in English based on the technical report and specifications

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Prerequisite Knowledge	This module is based on academic concepts and skills acquired in the following modules: • Strength of materials 1 (t.BA.MT.FL1.19HS) • Statics (t.BA.MT.ST.19HS) • Fluid Dynamics (t.BA.XX.FTH1.19HS) • Project Module 1 (t.BA.MT.PM1.19HS) • Project module 2 (t.BA.MT.PM2.19HS) • Project module 3 (t.BA.MT.PM3.19HS) • Virtual Product Development (t.BA.MT.VPM3.19HS)

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Learning Objectives (Competences)

Students...	Competencies	Taxonomies
can implement, test, develop and confirm requirements in concepts using the example of a pump.	F	K2, K3
can work productively under time pressure.	SO	K3
can deal with unplanned difficulties, define solutions and resolve conflicts.	SO	K6
can recognise, shape and actively promote their team culture.	SO	K4
can analyse professional skills within a team and make good use of interdisciplinary settings.	SO	K4
can assess their own competences and are confident to develop and implement their own ideas and suggestions.	SE	K6
Students are solution-oriented when dealing with change.	SE	K6
can motivate themselves and the team.	SE	K6
Students are critical, can adapt their own ideas and integrate themselves in a team.	SE	K5
can reflect on individual knowledge gaps and independently obtain information from experts, journals, books, companies etc.	SE	K4, K5, K6
can document and communicate projects appropriately.	M	K3
can learn to understand and use new software independently.	M	K1, K2, K3, K4
can share expert knowledge (in presentations and reports).	M	K3
can analyse assignments and convert them into efficient project management	M	K4
can compile technical reports including analysis, presentation and evaluation of measures.	F	K2
can carry out a detailed strength verification using analysis and FEM in order to finally verify the component.	F	K2, K3, K4, K5
can transfer a simple component into a physical model, which represents the real component behaviour with sufficient accuracy in order to further develop it according to the flow of forces.	F	K2, K3, K4, K5
can professionaly apply the sheet metal manufacturing process to a construction.	F	K3
can independently acquire and apply the necessary expertise to solve problems.	F	K3
can estimate and calculate manufacturing costs of individual parts and assemblies for serial production.	F	K4, K5
can take on different functions/roles and act accordingly.	SO	K5
can communicate in the project in a manner appropriate to the target audience and adhere to linguistic (oral/written) conventions.	SO	K3

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Performance Assessment

End-of-module exam	Assessment	Length (min.)	Weighting	Form
other			0	

Performance assessment during the semester	Assessment	Length (min.)	Weighting	Form
Project *Project effort 120 h*	Grade	0	100	acc. to module agreement

Classroom Attendance Requirement

None

Learning material

- Gross, D. & Hauger, W. & Schröder, J. & Wall, W. (2019). Technische Mechanik 1: Statik. 14 Edition. Deutschland: Springer-Verlag GmbH. ISBN 978-3-6625-9156-7.
- Documents on moodle platform
- Gülich, J. (2021). Kreiselpumpen. 5 Edition. Deutschland: Springer-Verlag GmbH. ISBN 978-3-662-59785-9.
- Supplier documentation: bearing catalogue, others as required
- Bohl, W. (2014). Technische Strömungslehre. 15 Edition. Deutschland: Vogel. ISBN 978-3-8343-3329-2.
- Gross, D. & Hauger, W. & Schröder, J. & Wall, W. (2021). Technische Mechanik 2: Elastostatik. 14 Edition. Deutschland: Springer-Verlag GmbH. ISBN 978-3-6626-1861-5.
- Intranet: documents for presentations, forms and supplementary documents

Comments