

Study branch Applied Mechanics

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Faculty	Faculty of Mechanical Engineering
Study programme	Engineering
Type of study	Bachelor
Language of instruction	English
Code of the branch	S01
Title of the branch	Applied Mechanics
Regular period of the study	3 years
Cost	50,000 CZK per semester
Coordinating department	Department of Applied Mechanics
Coordinator	doc. Ing. Martin Fusek, Ph.D.
Key words	Construction and Calculation, Materials, technology, development, experiment, rapid prototyping, CNC

About study programme

The graduate student gains the very good knowledge and ability in the field of solving the technical problems attached with mechanics. Except of standard design abilities and skills he gains the deeper insight and understanding to the physical background of the technical objects. The graduate will be able to perform the computer simulations as standard as single-purpose, using both commonly accessible and specialized software. The graduate also gains the ability to perform the measurement and evaluation in the fields of tensometry, photoelasticimetry and vibration diagnostic. The graduate will find employment in any mechanical engineering firm as analyst, computer simulation worker or designer.

Professions

- Industrial engineer

Hard skills

- Dynamics calculations
- Stiffness calculations
- Durability calculations
- 2D design programmes
- Computing SW Mathcad
- Strength calculations
- Bursting tests
- SW ANSYS
- SW CREO 3.0
- SW Autodesk Inventor
- Python programming language
- SW Matlab
- SW CAD
- Knowledge of materials
- Calculations of machine parts
- Orientation in technical drawings

Graduate's employment

The graduate will acquire the deeper knowledge of the mechanics of rigid bodies, stiffness and strength, the mechanics of liquids, termomechanics, the engineering materials, computer science, technical measurement and experimental methods. The emphasis is placed to the preparedness and ability to develop and practically use the computer methods for solving the technical problems. The graduate is able to practice the static, kinematic and dynamic analysis of structures and mechanisms, to evaluate the technical state of machines, to solve the technical problems, related to the fluid flow, to the dynamics of hydromechanic and thermodynamic systems. The graduate is able to use and develop the computer aid of design, projection and scientific activities in practical applications. The deeper knowledge of fundamental disciplines of mechanical engineering forms the wide basis for creative realizing in mechanical engineering and for subsequent professional grow up via consequential master and doctoral studies. The graduate can assert himself as a designer, computer modeling specialist, research worker, or in the technical diagnostic of machinery works, or after master and doctoral studies as the scientific worker.

Study aims

The branch Applied Mechanics provides students a deeper knowledge and understanding of the technical problems related to mechanics. In particular it relates to the questions of power transfer, stiffness and strength of mechanical parts, and further to machine dynamics and vibrations. The students learn how to analyze these problems and solve them using experimental and computer modeling. Emphasis is placed on the ability to use modern computer methods and to effectively evaluate the results of technical measurements. Graduates can find employment in technical and operational positions in engineering companies, as calculation specialists or designers, or if need be as staff in testing and development departments and diagnostic working centers. Branch graduates are also easily oriented on related engineering branches.

Graduate's knowledge

The graduate has the basic and advanced knowledge in mechanics. The extension means especially force transfer analysis, the stress distribution and dynamic behavior via both calculation and experiment. In dynamics this is the knowledge of describing and solving the complicated space motion, kinematic and dynamic solution of mechanisms and the essential analytical mechanics. Special emphasize on the vibration with more degrees of freedom. In flexibility and strength of materials this is the knowledge of the 2D and 3D combined loading, analysis and evaluation of the complex stress state. Farther the knowledge in Thermo-mechanics. The graduate has the detailed knowledge of the finite element method as on the theoretical level as practical application. The graduate has the basic knowledge in electrotechnics and numerical mathematics, experimental methods in mechanics, tensionmetry and vibration diagnostics.

Graduate's skills

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Graduate's general competence

The graduate is qualified to solve the more complicated problems in mechanical engineering, linked to mechanics. He is also qualified to standard designer practice and also to lead the small working team. He is qualified to communicate in foreign language, especially English.