CURRICULUM
UNDERGRADUATE UNIVERSITY STUDY OF MECHANICAL ENGINEERING

Rijeka, March 2015
## 1. CURRICULUM DESCRIPTION

### 1.1. The list of compulsory and elective courses with the number of active classes required for their performance and ECTS credits

<table>
<thead>
<tr>
<th>1. semester</th>
<th>Subject title</th>
<th>Hours / week</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>aT</td>
</tr>
<tr>
<td>Mathematics I</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Statics</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>Materials I</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Electrical Engineering</td>
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<td>3</td>
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<tr>
<td>Computer Applications in Engineering</td>
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<td>2</td>
<td>3</td>
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<tr>
<td>Engineering Graphics</td>
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<tr>
<td>TOTAL</td>
<td></td>
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</table>

L - lectures, aT – auditory tutorials, IT – laboratory tutorials, dT – design tutorials.

<table>
<thead>
<tr>
<th>2. semester</th>
<th>Subject title</th>
<th>Hours / week</th>
<th>ECTS</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>aT</td>
</tr>
<tr>
<td>Mathematics II</td>
<td>3</td>
<td>3</td>
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<tr>
<td>Kinematics</td>
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<td>2</td>
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<tr>
<td>Strength of Materials I</td>
<td>3</td>
<td>2</td>
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<tr>
<td>Materials II</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Modelling by Computer</td>
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<tr>
<td></td>
<td></td>
<td>L</td>
<td>aT</td>
</tr>
<tr>
<td>Dynamics</td>
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<td>2</td>
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<tr>
<td>Fluid Mechanics</td>
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<td>2</td>
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<td>Thermodynamics I</td>
<td>4</td>
<td>2</td>
<td>6</td>
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<td>Measurements and Quality Control</td>
<td>2</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Computational Methods</td>
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<td>Foreign Language IT</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>TOTAL</td>
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</table>

1 elective: English or German - free choice
### 4. semester

<table>
<thead>
<tr>
<th>Subject title</th>
<th>Hours / week</th>
<th>ECTS</th>
</tr>
</thead>
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<tr>
<td></td>
<td>L</td>
<td>aT</td>
</tr>
<tr>
<td>Engineering Statistics</td>
<td>2</td>
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</tr>
<tr>
<td>Machine Elements Design I</td>
<td>3</td>
<td>1</td>
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<tr>
<td>Hydraulic Machines</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Production Technologies</td>
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<td>1</td>
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<tr>
<td>Foreign Language II</td>
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<tr>
<td>Professional Practice I</td>
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### 5. semester

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<td>aT</td>
</tr>
<tr>
<td>Machine Elements Design II</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Heat Engines and Devices</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Production Machines, Tools, Jigs and Fixtures</td>
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<td>1</td>
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<tr>
<td>Technological Processes</td>
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<td>2</td>
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<tr>
<td>Elective Project²</td>
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<td><strong>TOTAL</strong></td>
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</table>

Subject from elective group Mechanical Engineering Design:
- Designing and Product Shaping: 2 hours, 4 ECTS

Subject from elective group Computational Mechanics:
- Computational Structural Analysis: 2 hours, 4 ECTS

Subject from elective group Technology and Operating Management:
- Production Planning and Control: 2 hours, 3 ECTS

Subject from elective group Thermal Energy and Marine Engineering:
- Heating Systems: 2 hours, 4 ECTS

**TOTAL** 25 hours, 30 ECTS

### 6. semester

<table>
<thead>
<tr>
<th>Subject title</th>
<th>Hours / week</th>
<th>ECTS</th>
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<tr>
<td>L</td>
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<tr>
<td>Energy Systems</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Automation</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Organization and Economics of Business Systems</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Free Elective Subject³</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Final Work</td>
<td>1</td>
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</table>

**Subject from elective group** Mechanical Engineering Design:
- Materials Characterization | 2 | 1 |  | 3 | 4

**Subject from elective group** Computational Mechanics:
- Computational Engineering | 2 |  |  | 2 | 4 | 4

**Subject from elective group** Technology and Operating Management:
- Quality Assurance | 2 | 1 |  | 3 | 4

**Subject from elective group** Thermal Energy and Marine Engineering:
- Marine Auxiliary Machinery | 2 | 1 | 1 | 4 | 4

**TOTAL** | 17 | 30

³election from list of offered subjects

### Free Elective Subjects

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<tr>
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<tr>
<td>L</td>
<td>aT</td>
<td>IT</td>
</tr>
<tr>
<td>Computer Simulations in Engineering</td>
<td>2</td>
<td></td>
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<tr>
<td>Introduction into Finite Element Method</td>
<td>2</td>
<td></td>
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<tr>
<td>Energy Sources</td>
<td>3</td>
<td></td>
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<tr>
<td>Processes of Heat Treatment</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Small Craft Building and Maintenance UN</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Technology Processes of Shipbuilding</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Basic Ship Dynamics</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Introduction to Modern Physics</td>
<td>2</td>
<td>1</td>
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<tr>
<td>System Modelling and Simulation</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Environment Protection</td>
<td>3</td>
<td></td>
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<tr>
<td>Physical and Health Education⁴</td>
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<td>2</td>
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</table>

⁴Subject can be enrolled as additional free elective subject

<table>
<thead>
<tr>
<th>UNDERGRADUATE UNIVERSITY STUDY OF MECHANICAL ENGINEERING TOTAL</th>
<th>Hours</th>
<th>ECTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td>134</td>
<td>180</td>
</tr>
</tbody>
</table>
1. COURSE DESCRIPTION

1.1. Course objectives

Understanding the basic principles of automation and its impact on economic and social development.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Describe the historical development of automation, define the reasons for the introduction of automation and describe the advantages and disadvantages of automation. Define the level of automation and explain the means of automation of manufacturing and service activities. Describe the methods and strategies of automation. Define a methodology for analysis and synthesis of flexible and intelligent systems. Describe the self-organizing system, explain the structure, function, advantages and disadvantages, and describe the evolution of automated devices, machines and systems. Describe case studies of automated devices, machines and systems and define scenarios and strategies of leadership. Describe the current status and development trends of automation and describe barriers to development and forecasting.

1.4. Course content


1.5. Teaching methods

☒ lectures
☒ seminars and workshops
☒ exercises
☒ long distance education
☒ fieldwork
☒ individual assignment
☐ multimedia and network
☐ laboratories
☐ mentorship
☐ other

1.6. Comments

Attendance, activities in the classroom, homework and self-study.

1.7. Student's obligations

Attendance, activities in the classroom, homework and self-study.

1.8. Evaluation of student's work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written exam</td>
<td>Oral exam</td>
<td>Essay</td>
<td>Research</td>
</tr>
<tr>
<td>Project</td>
<td>Sustained knowledge check</td>
<td>Report</td>
<td>Practice</td>
</tr>
<tr>
<td>Portfolio</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student's work during classes and on final exam

Attendance, activities in the classroom, homework, two control written exam and final oral and written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Katalinic, Industrieroboter und Flexible Systeme für Drehteile, VDI Verlag, Düsseldorf, 1990.</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>B. Katalinic, Intelligent Manufacturing Systems, skripta, Technische Universität Wien</td>
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<td></td>
</tr>
</tbody>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through a structured quality assurance system of the Faculty.
## 1. COURSE DESCRIPTION

### 1.1. Course objectives

Introduction to basic methods of dynamic analysis of the ship. Understanding stochastic processes and their application in the ship dynamics. Developing the ability to work in small groups (teamwork).

### 1.2. Course enrolment requirements

None.

### 1.3. Expected course learning outcomes

- Specify the methods of dynamic analysis of the ship. Properly explain, and interpret the basic parameters of the waves as a random process and make a simple statistical analysis of random processes. Explain the energy spectrum and the autocorrelation function and describe the application of Fourier series in the analysis of stochastic dynamic response. Define and solve linear oscillating model of rigid floating bodies motion with one degree of freedom on the sea waves. Itemize and explain the consequences of excessive motion of the ship. Define the types and causes of ship vibrations.

### 1.4. Course content


### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

### 1.6. Comments

- 

### 1.7. Student’s obligations

Course attendance, activity, studying.

### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written exam</td>
<td>Oral exam</td>
<td>Essay</td>
<td>Research</td>
</tr>
<tr>
<td>Project</td>
<td>Sustained knowledge check</td>
<td>Report</td>
<td>Practice</td>
</tr>
<tr>
<td>Portfolio</td>
<td>Homework</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 1.9. Assessment and evaluation of student’s work during classes and on final exam

- Course attendance, seminar paper, activity, continuous knowledge testing (three mid-term exams), written and oral exam.

### 1.10. Assigned reading (at the time of the submission of study programme proposal)

Prpić-Oršić J.: Basic ship Dynamics, Faculty of Engineering University of Rijeka, Fintrade &Tours, 2009. (in Croatian)

### 1.11. Optional / additional reading (at the time of proposing study programme)

Senjanović, I.: Ship vibrations I, University of Zagreb, 1974. (in Croatian)
1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prpić-Oršić J.: Basic ship dynamics, Faculty of Engineering University of Rijeka, Fintrade &amp; Tours, 2009. (in Croatian)</td>
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<td>8</td>
</tr>
</tbody>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

General knowledge of computer simulation technology. Knowing the capabilities and limitations of computer simulations. Identifying methods for solving engineering problems using computer simulations. Planning the entire process of application of computer engineering.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Explain the process of numerical modelling. Determine the appropriate method for computing a solution to a technical problem. Identify the major commercial software for numerical modelling. Analyze technical system and suggest ways it can be improved by applying computer engineering. Plan the entire process of applying computer simulations in industry.

1.4. Course content

Review and analysis of CAE systems in the industry. The process of mathematical modelling. Introduction to commercial software for numerical modelling. The definition of the problem and the appropriate model. The calibration process. Methodology of application computer simulations to solve engineering problems in industry.

1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written exam</td>
<td>2</td>
<td>Oral exam</td>
<td>Essay</td>
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<tr>
<td>Project</td>
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<tr>
<td></td>
<td>0.5</td>
<td>Research</td>
<td>Practice</td>
</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, homework, continuous knowledge testing (three mid-term exams), written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Software manuals and tutorials.

1.11. Optional / additional reading (at the time of proposing study programme)

-

1.12. Number of assigned reading copies with regard to the number of students currently attending the course
<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software manuals and tutorials</td>
<td>online copies</td>
<td>10</td>
</tr>
</tbody>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Recognize computational problems in mechanical engineering. Understand and apply basic numerical methods. Basic knowledge of MatLab or C programming language. Independently write shorter program code and use existing software for numerical problem solving.

1.2. Course enrolment requirements

Mathematics I

1.3. Expected course learning outcomes

Recognize appropriate computational methods for given simpler mathematical formulations of engineering problems. Correctly explain fundamental idea of particular computational methods. Correctly explain advantages and disadvantages of particular computational methods. Compare computational methods applicable to the same type of problem. Apply existing software to simpler problems. Write simple computer programs for particular computational methods by following instructions. Evaluate results of computational methods.

1.4. Course content


1.5. Teaching methods

☒ lectures
☒ seminars and workshops
☒ exercises
☒ long distance education
☒ fieldwork
☒ individual assignment
☒ multimedia and network
☒ laboratories
☒ mentorship
☒ other

1.6. Comments

-

1.7. Student's obligations

Course attendance, mid-term exams, computer knowledge checks.

1.8. Evaluation of student's work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
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<td>Sustained knowledge check</td>
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<td>Practice</td>
</tr>
<tr>
<td>Portfolio</td>
<td></td>
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</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, mid-term exams, computer knowledge checks, written and/or oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)

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1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining knowledge for autonomous stress and strain of analysis of structures applying computational methods.

1.2. Course enrolment requirements

Basic knowledge of solid body mechanics.

1.3. Expected course learning outcomes


1.4. Course content


1.5. Teaching methods

- Lectures
- Seminars and workshops
- Exercises
- Long distance education
- Fieldwork
- Individual assignment
- Multimedia and network
- Laboratories
- Mentorship
- Other

1.6. Comments

Course attendance, project tasks, studying.

1.7. Student’s obligations

Course attendance, project tasks, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
<th>0.5</th>
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</thead>
<tbody>
<tr>
<td>Written exam</td>
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<td>Research</td>
<td></td>
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<tr>
<td>Project</td>
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<tr>
<td>Portfolio</td>
<td>Homework</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, project tasks, written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


Sorić, J.: "Introduction into Numerical Methods in Mechanical Engineering", (in Croatian), University of Zagreb, Faculty of Mechanical Engineering.
Mechanical Engineering and Naval Architecture, 2009.

<table>
<thead>
<tr>
<th>Title</th>
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<th>Number of students</th>
</tr>
</thead>
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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution's quality assurance system.
## 1. COURSE DESCRIPTION

### 1.1. Course objectives

Acquiring knowledge and skills necessary for active participation in an computer aided engineering environment. This is primarily relating to the handling of personal computer operating system (Microsoft Windows) and the use of office applications (Microsoft Office) and general purpose engineering software (Mathcad, Matlab).

### 1.2. Course enrolment requirements

None.

### 1.3. Expected course learning outcomes

Adopt the basic concepts of computer technology. Use Microsoft Windows operating system. Use office applications Microsoft Word and Microsoft Excel. Use Mathcad software. Use the basics of the functionality of the software package Matlab.

### 1.4. Course content


### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

### 1.6. Comments

- 

### 1.7. Student’s obligations

Attendance, class participation, studying.

### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<td></td>
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</tbody>
</table>

### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, continuous knowledge testing (two mid-term exams), written exam.

### 1.10. Assigned reading (at the time of the submission of study programme proposal)


### 1.11. Optional / additional reading (at the time of proposing study programme)


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</thead>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
### 1. COURSE DESCRIPTION

#### 1.1. Course objectives


#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Correctly explain the methodology of mathematical modelling. Classify mathematical models typical of technical systems. Identify basic types of numerical network. Classify commercial software for numerical modelling. Explain the entire process of applying computer simulation in solving engineering problems. Perform a simulation of a simple problem of mechanical design, in available software.

#### 1.4. Course content


#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

- 

#### 1.7. Student's obligations

Attendance, class participation, individual assignment.

#### 1.8. Evaluation of student's work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>2</th>
<th>Experimental work</th>
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<td></td>
<td>Research</td>
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<td>Project</td>
<td>Sustained knowledge check</td>
<td>Report</td>
<td>0.5</td>
<td>Practice</td>
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<tr>
<td>Portfolio</td>
<td></td>
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</tr>
</tbody>
</table>

#### 1.9. Assessment and evaluation of student's work during classes and on final exam

Course attendance, activity, continuous knowledge testing, seminar paper.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)

I-DEAS, CATIA, FLUENT User Manuals.

#### 1.11. Optional / additional reading (at the time of proposing study programme)

-
1.12. *Number of assigned reading copies with regard to the number of students currently attending the course*

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<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
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<tbody>
<tr>
<td>I-DEAS, CATIA, FLUENT User Manuals.</td>
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</tbody>
</table>

1.13. *Quality monitoring methods which ensure acquirement of output knowledge, skills and competences*

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
Acquiring competence in correct embodiment design of products in mechanical engineering in regard to manufacturing, maintenance, environment, ergonomics, safety and costs.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Define functional and technological correctness. Explain guidelines for the correct embodiment design. Detect and on some cases analyze the correctness or incorrectness of the design. Compare manufacturing technologies regarding their advantages and drawbacks. Apply software for solving design problems.

1.4. Course content

1.5. Teaching methods
- lectures seminars and workshops
- exercises long distance education fieldwork
- individual assignment multimedia and network laboratories mentorship other

1.6. Comments
–

1.7. Student’s obligations
Course attendance, activity, solving of design problems, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<td>Portfolio</td>
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</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, 3 mid-term exams, design project, final written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)
Bode, E.: Design Atlas, Vieweg, Braunschweig/Wiesbaden, 1996. (in German)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course
### Title and Number of copies

<table>
<thead>
<tr>
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<th>Number of students</th>
</tr>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining theoretical knowledge and developing skills for the determination of dynamics characteristics of motion of particles, systems of particles and rigid body. Capability of qualitative and quantitative analysis of basic characteristics of dynamical systems.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Define and explain Newton’s laws and the concept of inertial forces. Calculate the simpler examples based on the principles of the change of momentum, angular momentum and the law of change of kinetic energy of material particles. Define the concept of momentum, angular momentum as well as kinetic energy and mechanical work of a system of particles. Calculate the tasks based on the principles of the change of momentum, angular momentum and the principle of kinetic energy of a system of particles. Define the generalized coordinates and set up and solve the II. order Lagrange equations for easier dynamic systems. Analyze the dynamics of systems with variable masses. Define the mass moment of inertia of a rigid body. Classify and compare the methods of experimental determination of the mass moment of inertia of a rigid body. Apply the Euler equations of motion of a rigid body. Set up the loads and calculate the dynamic reactions for the rotation of a rigid body around the fixed axis. Apply this knowledge to the motion of the rotor in the bearings. Apply the gyroscopic theory of on the appropriate dynamic examples. Calculate and analyze the motion of material particles and rigid bodies in the case of collision. Calculate the center of impact.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

<table>
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<td>Report</td>
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<tr>
<td>Portfolio</td>
<td>Homework</td>
<td>0.5</td>
<td>Practice</td>
</tr>
</tbody>
</table>
1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, 3 constructional exercises, continuous knowledge testing (two mid-term exams), written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Jecić, S.: Mechanics (Kinematics and Dynamics), Tehnička knjiga, Zagreb, 1989. (in Croatian)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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<tr>
<th>Title</th>
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<th>Number of students</th>
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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
### Basic description

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<td>ECTS student’s workload coefficient</td>
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<tr>
<td></td>
<td>Number of hours (L+E+S)</td>
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</tbody>
</table>

### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Application of acquired knowledge and skills to solve practical problems in the field of associated course from which the project is elected.

#### 1.2. Course enrolment requirements

Enrolled course from which the project is elected.

#### 1.3. Expected course learning outcomes

Apply the knowledge and skills from professional content of the associated course. Solve practical task. Acquire competence for individually solving specific professional tasks.

#### 1.4. Course content

Chosen chapter of associated course from which the project was elected.

#### 1.5. Teaching methods

- [ ] lectures
- [ ] seminars and workshops
- [ ] exercises
- [ ] long distance education
- [x] individual assignment
- [ ] multimedia and network
- [ ] laboratories
- [ ] mentorship
- [ ] other

#### 1.6. Comments

#### 1.7. Student’s obligations

Attending the consultation, individually solving task and writing the project report.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<td>Report</td>
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<td>Portfolio</td>
<td>Individual task solving</td>
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</tbody>
</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Assesses and evaluates the accuracy and completeness of the project task solution and its presentation.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)

References listed for the associated course from which the project is elected.

#### 1.11. Optional / additional reading (at the time of proposing study programme)

References listed for the associated course from which the project is elected.

#### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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1.13. *Quality monitoring methods which ensure acquisition of output knowledge, skills and competences*

Through the Institution's quality assurance system.
<table>
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<td>Number of hours (L+E+S)</td>
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</table>

### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Mastering basic concepts, postulates and methods of electrostatics, magnetostatics and electrical circuits. Describing behavior of electromagnetic circuits’ main components and analysis of electrical circuits.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Describe and apply basic laws of electrostatics. Define and use basic electric quantities. Apply fundamental laws and methods of DC circuits. Describe and apply basic laws of magnetostatics. Analyse AC circuits. Organize and conduct electric measurements.

#### 1.4. Course content


#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

#### 1.7. Student’s obligations

Course attendance, homeworks, studying.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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</tr>
</tbody>
</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, continuous knowledge testing (homeworks, mid-term exams), written and oral exam.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)


#### 1.11. Optional / additional reading (at the time of proposing study programme)

- Felja, I., Koračin, D.: A collection of assignments and solved examples from fundamentals of electrical engineering, part 1.
1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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</tr>
</thead>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining theoretical knowledge in the field of energy engineering. Acquiring the basic knowledge required for attending lectures in the field of thermal and energy engineering.

1.2. Course enrolment requirements

Basic knowledge of thermodynamics.

1.3. Expected course learning outcomes

Describe the energy conversion and compare conventional energy sources. Describe ways of electricity production. Describe the use of nuclear energy and interpret the operation of nuclear power station. Define and describe the types of renewable energy sources. Describe the basic characteristics of hydro power usage. Describe the basic characteristics and ways to use the solar energy. Describe the basic characteristics of wind energy. Describe the basic characteristics of geothermal energy and biomass energy. Describe and compare ways of using environmental heat by heat pumps. Describe how to obtain and utilize the hydrogen as an energy source. Define and describe the basic principles of energy planning and energy policy.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course and fieldwork attendance, seminar work, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<tr>
<td>Portfolio</td>
<td>Homework</td>
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</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course and fieldwork attendance, continuous knowledge testing (two mid-term exams), seminar work, written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Several authors: Renewable Energy Sources, Energetika marketing, Zagreb, 2002. (in Croatian)
1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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<tr>
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<tr>
<td>Several authors: Renewable Energy Sources, Energetika marketing, Zagreb, 2002. (in Croatian)</td>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
## 1. COURSE DESCRIPTION

### 1.1. Course objectives

Acquisition of theoretical knowledge and develop the skills needed to solve technical problems in the design phase, construction and management of energy systems. Developing competencies for project management in the energy sector.

### 1.2. Course enrolment requirements

None.

### 1.3. Expected course learning outcomes

Describe the changes of the working fluid states in energy processes. Draw diagrams of state changes in energy processes. Define and analyze energy and exergy losses in energy processes. Calculate the energy losses and efficiency of the process. Calculate the size of the main energy processes. Develop a basic scheme of energy systems. Define the basic operating parameters and sizes of power systems. Analyze and explain the influential parameters of energy processes. Calculate and explain the operating costs of power plants. Describe ways of increasing the efficiency of energy systems. Describe the sources and ways to reduce environmental pollution in energy plants.

### 1.4. Course content


### 1.5. Teaching methods

- **X** lectures
- **X** seminars and workshops
- **X** exercises
- **X** long distance education
- **X** fieldwork
- **□** individual assignment
- **□** multimedia and network
- **□** laboratories
- **□** mentorship
- **□** other

### 1.6. Comments

### 1.7. Student’s obligations

Course attendance, Activity, Studying

### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>2</th>
<th>Activity/Participation</th>
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<th>Experimental work</th>
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</table>

### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, continuous knowledge testing (2 mid-term exams), written or oral exam.
### 1.10. Assigned reading (at the time of the submission of study programme proposal)
- Prelec, Z.: Written lectures of the course (pdf. on Faculty web)

### 1.11. Optional / additional reading (at the time of proposing study programme)

### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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### 1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution's system of quality assurance.
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<td><strong>ECTS credits and teaching</strong></td>
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</table>

### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

The achievement of proficiency in the development and interpretation of engineering graphics by means of traditional tools and computer. The development of ability to utilize graphics as a system of communication in which the ideas are expressed clearly and in standard drafting formats.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Interpret and apply traditional and CAD techniques for the development of 2D geometrical model. Compare and distinguish the methods of shape description. Compare 3D primitives and interpret the emergence of complex objects. Interpret and apply ISO code system for linear size tolerances, fits, geometrical tolerances and surface texture. Interpret engineering graphics. Model and organize engineering documentation in accordance with the standards. Estimate personal contribution and the contribution of lecturer to the acquisition of contents.

#### 1.4. Course content

Graphical communications. Traditional and CAD techniques, the role of the graphics. The shape description: projection theory, multi-view drawings, sectional views, pictorial representations. Standardization and standards. Technical documentation graphics: size description, tolerances and fits, geometrical tolerances, texture of technical surfaces.

#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

#### 1.7. Student’s obligations

Course attendance and activity (lectures, exercises), constructive works, continuous knowledge testing, homework, studying.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, homework, 2 constructive works, continuous knowledge testing (2 exams), written exam.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)


#### 1.11. Optional / additional reading (at the time of proposing study programme)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
## 1. COURSE DESCRIPTION

### 1.1. Course objectives

Acquiring basic knowledge and skills in probability and statistics needed for solving problems in engineering practice.

### 1.2. Course enrolment requirements

Mathematics I, Mathematics II.

### 1.3. Expected course learning outcomes

Define basic terms in descriptive statistics and perform statistical data analysis. Define and interpret correctly: random, events and probabilities of events. Express and interpret correctly the total probability rule and Bayes theorem. Apply rules for evaluating the probability of intersection and union of events, conditional distributions, total probability and Bayes theorem. Define and interpret correctly random variables, interpret correctly and calculate means and variances. Describe some basic probability distributions, interpret correctly their meaning and use them in typical experiments. Express and understand the central limit theorem. Estimate some parameters of a population or a probability distribution from samples (confidence intervals). Express and interpret correctly basic concept about statistical hypotheses tests, and particularly, explain the concept of goodness of fit test and perform it. Define and interpret correctly basic concepts of random vectors. Determine the linear regression functions for two-dimensional statistical data set and interpret the results correctly.

### 1.4. Course content

Descriptive statistics.
Basics of probability theory: events, probability and probability space. Bayes theorem.
Random variable: probability distribution function, cumulative distribution function, numerical parameters.
Standard probability distributions. Central limit theorem.
Two-dimensional statistical data, numerical parameters.
Two-dimensional random vectors. Regression and correlation.

### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

### 1.6. Comments

### 1.7. Student’s obligations

Class attendance, activity, mid-term exams, tests, tests on computer.

### 1.8. Evaluation of student’s work

<table>
<thead>
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</table>

### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, tests on computer, mid-term exams, tests on computer, written and oral exam
### 1.10. Assigned reading (at the time of the submission of study programme proposal)

Elezović, N., Discrete probability; Random variables; Statistics and processes, Biblioteka Bolonja, Element, Zagreb 2007 (in Croatian)

### 1.11. Optional / additional reading (at the time of proposing study programme)

Pauše, Ž.: Introduction to mathematical statistics, Školska knjiga Zagreb, 1993 (in Croatian)

### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
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<th>Title</th>
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<th>Number of students</th>
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</thead>
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<tr>
<td>Črnarić-Zić N., Material of course and solved problems in Engineering statistics, Rijeka 2010.</td>
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</tbody>
</table>

### 1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Students should be able to use general purpose English as well as technical jargon at the elementary level according to the Common European Framework of Reference for Languages (up to B1 level).

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Students should be able to use general purpose English as well as technical jargon at the elementary level according to the Common European Framework of Reference for Languages (up to B1 level). They should be able to: compare general with technical English on the basis of selected texts and topics; recognize and explain grammatical structures and principles typical of the university jargon from examples (Word Formation; Nouns; Compound Nouns; Definite and Indefinite Article; Perfect, Continuous and Passive Aspects; Modals; Comparison of Adjectives; Collocations); implement grammatical structures and aspects in written exercises; recognize terminology, key words and/or information in selected texts as well as differentiate and analyze relevant elements in them; describe and interpret accurately simple diagrams, charts, figures and mathematical formulae; write summaries, arguments and definitions.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Attendance, activity in class and independent learning.

1.8. Evaluation of student’s work

Course attendance 1 Activity/Participation Seminar paper Experimental work
Written exam 0.5 Oral exam Essay Research
Project Sustained knowledge check 1.5 Report Practice
Portfolio

1.9. Assessment and evaluation of student’s work during classes and on final exam

Attendance, presentation/report, various assignments and continuous evaluation of knowledge (two tests), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Mance K.: Mechanical Engineering 2011/12., MudRi.
### 1.11. Optional / additional reading (at the time of proposing study programme)

[www.englishpage.com](http://www.englishpage.com)

### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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</table>

### 1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution’s Quality Assurance System.
1. COURSE DESCRIPTION

1.1. Course objectives

Students should be able to use professional jargon independently, namely communicate with other experts in the field of the engineering profession and in an international environment, at the B2 level of the Common European Framework of Reference for Languages.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Students should be able to use professional jargon like experts in Electrical Engineering who spend the most of their time in the plant, i.e. in the field, and to a lesser extent in the office, at the B2 level of the Common European Framework of Reference for Languages. Students should be able to: recognize and explain grammatical structures typical of the university jargon (Particiles. Relative Clauses. Sequence of Tenses. Direct and Indirect Speech. Conditional Clauses. Final Clauses); implement grammatical structures in written exercises; analyse and differentiate terminology and relevant elements in texts; paraphrase certain relevant parts in the text; write summaries of the text, arguments and definitions; analyse and describe complex diagrams, charts, figures, processes, experiments and mathematical formulae; defend orally their own positions as well as critically evaluate individual solutions of a problem.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Attendance, activity in class and independent learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
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<td>Project</td>
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<td>Report/Presentation</td>
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<td>Portfolio</td>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Attendance, presentation/report, continuous evaluation of knowledge (two tests), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Mance K.:Mechanical Engineering 2011/12., MudRi.
Mance K.:Grammar Files I, 2011/12, MudRi
### 1.11. Optional / additional reading (at the time of proposing study programme)

[www.englishpage.com](http://www.englishpage.com)

### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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### 1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution’s Quality Assurance System.
<table>
<thead>
<tr>
<th>Basic description</th>
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<tbody>
<tr>
<td><strong>Course title</strong></td>
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<td><strong>Study programme</strong></td>
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<td><strong>Course status</strong></td>
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<tr>
<td><strong>Year</strong></td>
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<td><strong>ECTS credits and teaching</strong></td>
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</table>

### 1. COURSE DESCRIPTION

#### 1.1. Course objectives
Define the basic concepts of ecology and environmental protection. To analyze the impact of the technological aspects of the environment. Describe the processes that affect pollution. Compare technologies and their impact. Distinguish the development of sustainable development. Argue the importance of sustainable development. Describe the current problems of global pollution. Distinguishing the basic concepts of ecology and environmental protection. Understanding the impact of technology on the environment.

#### 1.2. Course enrolment requirements
None.

#### 1.3. Expected course learning outcomes
Developing the skills of analysis and synthesis and creativity in solving problems. Developing the ability to adapt to new situations. Developing the ability to work in an interdisciplinary team, and communication with experts in other fields. Developing the ability to create and project management in the field of environmental protection.

#### 1.4. Course content

#### 1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments
-

#### 1.7. Student’s obligations
Attendance, activity, class participation, research and search the literature sources, making self-employment, consulting, independent learning, presentation of work.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
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<td>Project</td>
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<td>Report</td>
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<td>Portfolio</td>
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</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, activity, continuous knowledge testing, written and oral exam.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)

#### 1.11. Optional / additional reading (at the time of proposing study programme)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
## 1. COURSE DESCRIPTION

### 1.1. Course objectives

The Final Work is an individual assignment and verification of student expertises, which should show the appropriate level of engineering skills for individually solving specific professional task.

### 1.2. Course enrolment requirements

Enrolled course from which the Final Work is selected.

### 1.3. Expected course learning outcomes

Apply acquired knowledge, expertises and skills of the content of Final Work associated course. Solve practical task. Acquire competence for individually solving specific professional task.

### 1.4. Course content

The content of the Final Work is based on the application of acquired knowledge from educational programs at the undergraduate university studies. Final thesis can be specified from a particular course specific professional content and exceptionally from course that belongs to the group of shared content, when it represents a broader entity with a particular course specific content of the studies. Student enrols the Final Work by enrolling the last semester. Thesis of the Final Work is established by Commission for Final Works, based on suggestion of teacher who will mentor the Final Work.

### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

### 1.6. Comments

### 1.7. Student’s obligations

Attending the consultation, individually solving task and writing the Final Work report.

### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<td>Report</td>
<td>Practice</td>
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<td>Portfolio</td>
<td>Individual task solving</td>
<td>8</td>
<td>Final work in written form</td>
</tr>
</tbody>
</table>

### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Assesses and evaluates the accuracy and completeness of a given task solving process, the Final Work written report, and its oral presentation.

### 1.10. Assigned reading (at the time of the submission of study programme proposal)

### 1.11. Optional / additional reading (at the time of proposing study programme)

### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course
1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
Understanding the physical meaning of laws and equations of fluid mechanics and developing students’ abilities to solve problems related to the field of fluid mechanics and the development of independent work and projects related to various problems involving fluid mechanics.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Define and describe fluid properties. Define and describe fluid statics: Euler equation of fluid statics, relative fluid movement, stability, fluid pressure on flat and curved surfaces, buoyancy. Define and describe the basic laws of fluid dynamics: Conservation of Mass - The Continuity Equation, The Linear Momentum and Moment of Momentum Equations with the Bernoulli equation, The Energy Equation with the modified Bernoulli equation. Define and describe laminar and turbulent viscous fluid flow. Apply the basic laws of fluid mechanics to calculate the physical values of the fluid flow, orifice flow, flow through the wide openings, Venturi meter and Pitot-Prandtl tube. Calculate fluid flow losses through a complex pipeline system.

1.4. Course content

1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations
Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work
Course attendance 2.5 Activity/Participation - Seminar paper - Experimental work -
Written exam 1 Oral exam - Essay - Research -
Homework - Sustained knowledge check 1.5 Report - Practice -
Portfolio -

1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, activity, homework, continuous knowledge testing (two mid-term exams), written exam
1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<td>L. Sopta, L. Kranjčević, Fluid mechanics, skripta. Faculty of Engineering Rijeka, 2004.</td>
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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Students should be able to use general purpose German as well as technical jargon at the elementary level according to the Common European Framework of Reference for Languages (up to B1 level).

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Students should be able to: compare general with technical German on the basis of selected texts and topics from the field of mechanical engineering, naval architecture and electrical engineering; recognize and explain grammatical structures and principles typical of the vocational jargon from examples (Tenses; Modals, Compounds, Word Formation, Dependent Clauses, Passive Structures); implement grammatical structures and aspects in written exercises; recognize key words and/or information in selected texts as well as differentiate and analyse relevant elements in them; describe and interpret accurately simple diagrams, charts, figures and mathematical formulae.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork

- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Attendance, activity in class, independent learning.

1.8. Evaluation of student’s work

Course attendance 1 Activity/Participation Seminar paper 0.25 Experimental work
Written exam 0.5 Oral exam Essay Research
Project Sustained knowledge check 1.25 Report Practice
Portfolio

1.9. Assessment and evaluation of student’s work during classes and on final exam

Attendance, seminar paper, continuous evaluation of knowledge (two tests), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Grujoski / Kovačić: Texts, exercises ans assignments in German language for electrical engineering. Školska knjiga Zagreb. (in Croatian)
Lardšnjader, R.: Texts, exercises ans assignments in German language for mechanical engineering. Školska knjiga, Zagreb. (in Croatian)
1.11. Optional / additional reading (at the time of proposing study programme)

Selected texts.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<td>Štambuk / Marinič: Deutsch und Technik. Školska knjiga 1993</td>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s Quality Assurance System.
1. COURSE DESCRIPTION

1.1. Course objectives

Students should be able to use professional jargon independently, namely communicate with other experts in the field of the engineering profession and in an international environment, at the B2 level of the Common European Framework of Reference for Languages.

1.2. Course enrolment requirements

Attended course German Language I.

1.3. Expected course learning outcomes

Students should be able to: recognize and explain grammatical structures typical of the vocational jargon (Conditional Clauses. Infinitive Forms. Present and Past Participle); implement grammatical structures in written exercises; differentiate and analyse relevant elements in the text; paraphrase certain relevant parts in the text; write summaries of the text; analyse and describe complex diagrams, charts, figures, processes and mathematical formulae; defend orally their own positions as well as critically evaluate individual solutions of a problem.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Attendance, activity in class, independent learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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1.9. Assessment and evaluation of student’s work during classes and on final exam

Attendance, activity in class, continuous evaluation of knowledge (two tests), seminar paper, written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

Grujoski / Kovačić: Texts, exercises ans assignments in German language for electrical engineering. Školska knjiga Zagreb. (in Croatian)
Lardšnajder, R.: Texts, exercises ans assignments in German language for mechanical engineering. Školska knjiga, Zagreb. (in Croatian)
Štambuk / Marinić: Deutsch und Technik. Školska knjiga 1993.
1.11. **Optional / additional reading (at the time of proposing study programme)**

Selected texts.

1.12. **Number of assigned reading copies with regard to the number of students currently attending the course**

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1.13. **Quality monitoring methods which ensure acquirement of output knowledge, skills and competences**

Through the Institution’s Quality Assurance System.
1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining theoretical knowledge and skills about heat engines and devices.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Obtaining theoretical knowledge about different heat engines and devices. Apply the laws of thermodynamics and fluid mechanics on different heat engines and devices. Calculate the basic processes in heat engines and devices. Understand the energy fluxes within heat engines and devices. Analyze and sketch heat engines and devices and the relative processes.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Lectures and exercises attendance, individual learning and exercise solving.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<th>Activity/Participation</th>
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1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, continuous knowledge testing (two mid-term exams), written or oral final exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Within the course students acquire theoretical knowledge and skills that are required to solve practical problems related to the design and use of building heating devices and systems.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Describe psychophysical factors that affect human comfort in enclosed spaces. Use climate – meteorological data for building energy balance calculations. Comment the influence of thermal properties of building materials and building characteristics on building energy consumption. Calculate energy demand for building heating and domestic hot water preparation. Compare local, central and district heating systems. Differentiate types of heating devices for hot water central heating systems. Explain tasks and design of the basic elements of central heating systems - radiators, convectors and surface heating systems; chimneys; piping; circulation pumps; expansion vessels; isolation, control and safety valves and pipe fittings. Consider use of solar thermal energy for domestic hot water preparation. Classify types of automatic controls for heating systems. Apply acquired knowledge to solve practical problems of sizing and selection of the elements and devices of heating systems.

#### 1.4. Course content


#### 1.5. Teaching methods

- Lectures
- Seminars and workshops
- Exercises
- Long distance education
- Fieldwork
- Individual assignment
- Multimedia and network
- Laboratories
- Mentorship
- Other

#### 1.6. Comments

#### 1.7. Student’s obligations

Course attendance, activity, homework, studying.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<td>Portfolio</td>
<td>Homework</td>
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</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, activity, homework, continuous knowledge testing (two mid-term exams), written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)
Recknagel, Sprenger, Schramek: Heitzung und Klimatechnik 05/06, Springer Verlag, München, 2005.

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences
Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
An understanding of hydraulic machinery fundamentals and methods for selection of hydraulic machines in different work regimes. Understanding the limits of hydraulic machinery application, related to cavitation. Understanding the pump operating point. Understanding of the operation of a complex system composed of several turbomachines.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Define and describe hydraulic machines classification. Define and describe the Euler turbine equation and methods for selection of turbomachines. Define, describe and apply dimensional analysis, similarity laws for turbomachinery, model testing and sizing, selection, and performance of turbomachines. Apply acquired knowledge of turbomachines to water turbines (Kaplan, Francis and Pelton), pumps and fans. Define and describe the degree of reactivity, cavitation and NPSH for pumps. Define and analyze numerical fluid flow modelling in turbomachines: isolated profile analyses and planar flow through a cascade. Describe and analyze the operation of a system that consists of several turbomachines.

1.4. Course content

1.5. Teaching methods
- Lectures
- Seminars and workshops
- Exercises
- Long distance education
- Individual assignment
- Multimedia and network labs
- Mentorship

1.6. Comments

1.7. Student’s obligations
Attendance, activity, homework, independent learning

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, activity, homework, continuous testing of knowledge (two mid-term exams), final exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)
1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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<tr>
<th>Title</th>
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<th>Number of students</th>
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<tr>
<td>Pečornik, M., Hydraulic machines fundamentals, Tehnički fakultet Rijeka, 1977. (in Croatian)</td>
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<td>Horvat, D., Vodne turbine, Tehnička knjiga, 1955., (in Croatian)</td>
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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
**1. COURSE DESCRIPTION**

1.1. Course objectives

Obtaining theoretical knowledge and develop skills to solve practical problems with the finite element analysis of solids.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes


1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

-

1.7. Student’s obligations

Course attendance, activity, homework, seminar paper, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
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<td>Portfolio</td>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, homework, seminar paper, written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
Adoption of theoretical knowledge and develop the ability to differentiate properties and concepts of classical and modern physics. Forming a proper view of the interpretation of physical phenomena and their applications in engineering.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes

1.4. Course content

1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments
-

1.7. Student’s obligations
Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

<table>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, activity, continuous knowledge testing, written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)
1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
Basic description

<table>
<thead>
<tr>
<th>Course title</th>
<th>Kinematics</th>
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<tr>
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</tbody>
</table>

1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining theoretical knowledge and develop skills for determination of kinematic characteristics of motion of particles and rigid body. Capability of qualitative and quantitative analysis of basic characteristics of motion as trajectory, displacement, velocity and acceleration.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Define the space motion of material particles in Descartes, cylindrical, spherical and natural coordinate system. Calculate the trajectory as well as velocity and acceleration components of material particles in different coordinate systems. Transform the velocity and acceleration from one coordinate system to another. To analyze the motion of material particles during motion. Define the degrees of freedom of motion and types of motion of a rigid body. Calculate the velocity and acceleration of translation and rotation about a fixed axis of a rigid body. Calculate the velocity and acceleration of the plane motion of a rigid body by applying analytical and grafoanalytical methods. To analyze the motion of planar mechanisms. Calculate the angular velocity and angular acceleration as well as speed and acceleration in the case of motion about a fixed point. To analyze the general case of motion of a rigid body. Distinguish the relative motion of particles and rigid bodies from a simple motion.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

<table>
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<tr>
<th>Course attendance</th>
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<th>Activity/Participation</th>
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<td>Portfolio</td>
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<td>Homework</td>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, 3 constructional exercises, continuous knowledge testing (two mid-term exams), written and oral exam.
1.10. Assigned reading (at the time of the submission of study programme proposal)

Jecić, S.: Mechanics (Kinematics and Dynamics), Tehnička knjiga, Zagreb, 1989. (in Croatian)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<tr>
<th>Title</th>
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<tr>
<td>Žigulić, R., Braut, S.: Kinematics, Faculty of Engineering – University of Rijeka, 2012. (in Croatian)</td>
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<tr>
<td>Jecić, S.: Mechanics (Kinematics and Dynamics), Tehnička knjiga, Zagreb, 1989. (in Croatian)</td>
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<td>142</td>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Acquiring knowledge about topics related to machine elements: loads, stresses, types, functions, designs, materials and calculations.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Explain the design process. Differentiate types of loads and stresses. Define formulae for the calculation of stresses and allowable stresses. Differentiate machine elements. Describe and analyze the calculation of fasteners, joints, axes and shafts. Sketch fasteners, joints, axes and shafts. Apply acquired knowledge in solving design problems.

1.4. Course content

Fundamentals of design. Design process.
Axes and shafts. Critical speed.

1.5. Teaching methods

1.6. Comments

–

1.7. Student’s obligations

Course attendance, activity, solving of design problems during exercises and at home, studying.

1.8. Evaluation of student’s work

Course attendance 2.5 Activity/Participation 2.5 Seminar paper 2.5 Experimental work
Written exam 1 Oral exam Essay Research
Project 2 Sustained knowledge check 1.5 Report Practice
Portfolio

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, 4 written or oral mid-term exams, design projects, final written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)
1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution’s quality assurance system.
### Basic description

<table>
<thead>
<tr>
<th>Course title</th>
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<tbody>
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<td>ECTS student’s workload coefficient</td>
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<tr>
<td></td>
<td>Number of hours (L+E+S)</td>
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</table>

### 1. COURSE DESCRIPTION

1.1. Course objectives

Development of theoretical knowledge of elements of transmissions. Solving elementary design problems in the field of belt and gear drives. Skills to solve practical problems in the design of couplings and radial hydrodynamic bearings.

1.2. Course enrolment requirements

Attended course Machine Elements Design I.

1.3. Expected course learning outcomes

Choosing the criteria for dimensioning and embodiment design of basic power transmission elements. Introduction in design belt and gear transmission. Construct a coupling. Construct radial bearing with hydrodynamic lubrication. Apply the acquired knowledge to concrete machine design problems.

1.4. Course content

- Exercises: Design and construction of friction transmission or tooth transmission (homework). Design and dimensioning friction coupling, including sketches and drawings of nontrivial parts (program). Design and dimensioning of radial HD bearing, including sketches and drawings of nontrivial parts (program).

1.5. Teaching methods

- Lectures
- Seminars and workshops
- Exercises
- Long distance education
- Fieldwork

- Individual assignment
- Multimedia and network
- Laboratories
- Mentorship
- Other

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, project tasks, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
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<td>Project</td>
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<td>Practice</td>
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<td>Portfolio</td>
<td>Homeworiks</td>
<td>0.5 Program</td>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance. Oral examination through two mid-term exams. Continuous evaluation of accuracy, precision, completeness and creativity in solving the problem assignment. Written verification of acquired knowledge on the final exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

- Obsieger, B., Belt Transmissions (In Croatian), Faculty of Engineering, Rijeka, 2012.
- Obsieger, B., Couplings (In Croatian), Faculty of Engineering, Rijeka, 2012.
Obsieger, B., Gear Transmissions (In Croatian), Faculty of Engineering, Rijeka, 2012.
Obsieger, B., Rolling Bearings (In Croatian), Faculty of Engineering, Rijeka, 2012.

1.11. Optional / additional reading (at the time of proposing study programme)

Flender Technical Handbook (In English or German), free pdf-book on flender.com
Decker, K.H., Elements of Machines (In Croatian or German)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
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<tbody>
<tr>
<td>Kraut’s Mechanical Manual (In Croatian), Axiom, Zagreb, 1997., 2009.</td>
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<td>Obsieger, B., Belt Transmissions (In Croatian), Faculty of Engineering, Rijeka, 2012.</td>
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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution’s quality assurance system.
### Basic description

<table>
<thead>
<tr>
<th>Course title</th>
<th>Marine Auxiliary Machinery</th>
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<tbody>
<tr>
<td>Study programme</td>
<td>Undergraduate University Study of Mechanical Engineering</td>
</tr>
<tr>
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</table>

#### 1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining theoretical knowledge and develop skills to solve practical problems in the field of marine auxiliary machinery.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Define elements of ship pipelines and pumps. Analyze pumps in serial or parallel connection and NPSH value. Describe parts and working principle of centrifugal separators. Describe and compare filtering equipment. Describe and compare ship fresh water generators. Describe and compare types of heat exchangers on ships. Describe and compare hydraulic steering gears. Describe parts and design of ship shaft lines.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

<table>
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<tr>
<th>Course attendance</th>
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<td>Portfolio</td>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, continuous knowledge testing (two mid-term exams), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Student can be able to know the difference between different materials and possibilities for their application in mechanical engineering.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Analyze and define the types of chemical bonds in crystal systems of metal and ceramics. Identify and analyze the ideal and the real structure of materials and describe the influence of the material properties. Draw and explain the binary equilibrium, c diagrams, determine the stage (and their quantitative share) for the eutectic, peritectic and eutectoid reaction, determine the microstructure and explain the impact of the alloying element. Define and explain the polymers, the polymerization reaction and the different classifications of polymeric materials. Display properties and areas of application for PE, PP, PVC, PC, PMMA, PS, PTFE, Bakelite, epoxy resins, rubber and ways of processing and their use. Explain the difference between traditional and technical (advanced) of ceramic material and indicate their application. Explain the difference between fiber-reinforced, laminates and honeycomb sandwich structure of the composite materials.

#### 1.4. Course content


#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

#### 1.7. Student’s obligations

Course attendance, activity, homework, studying.

#### 1.8. Evaluation of student’s work

<table>
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<td>Report</td>
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<tr>
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<td></td>
<td>Practice</td>
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</tbody>
</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, homework, continuous knowledge testing (three mid-term exams), written and oral exam.
1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Student will be informed with production of materials and material properties, same as microstructure characterization. Moreover, student will acquire basic modification methods of alloy properties.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Analyse the application of equilibrium diagrams. Define the relation between microstructure and material properties. Describe the basic properties of materials. Analyse the methods of materials testing. Define the mechanisms and methods of material properties modification.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork

- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, homework preparation, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>1.5 Activity/Participation</th>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, homework, sustained knowledge check (two mid-term exams), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)

### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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### 1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Students will learn about the importance and special methods of characterization of materials.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

To analyze the importance and possibility of surface characterization of materials characterization in assessing the applicability of the materials in the industry. Analyze methods of characterization of materials. Explain the connection between structure and character of the material. Indicate and describe the methods and procedures for microanalysis of materials and describe the principles of optical and electron microscopy. Explain methods and procedures of spectroscopy. Define ways of taking and preparing samples for characterization of materials. Choose a method of characterization of materials in assessing the quality of materials.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, homework, continuous knowledge testing (two mid-term exams), seminar paper, written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
</tr>
</thead>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Acquiring basic knowledge and skills in linear algebra and calculus.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Define and correctly interpret basic notions in linear algebra, single-variable functions, and single-variable calculus. State and correctly interpret basic results in linear algebra and single-variable calculus. Carry out basic computations with matrices, vectors, determinants; determine solutions of systems of linear equations. Apply vector operations to compute some areas, volumes; determine equations of planes and lines. Compute limit values and derivatives of single-variable functions. Apply integration rules and evaluate indefinite and definite integrals of some function.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

-

1.7. Student’s obligations

Course attendance, activity/participation, mid-term exams, and tests.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
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<td>Essay</td>
<td>Research</td>
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<tr>
<td>Project</td>
<td>Sustained knowledge check</td>
<td>2.5 Report</td>
<td>Practice</td>
</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity/participation, sustained knowledge check (mid-term exams, tests), and written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)

Demidović, B. P.: Tasks and solved examples from mathematics, Tehnička knjiga, Zagreb, (in Croatian)
Devide, V. i oth.: Solved Problems in mathematics, 1-4, Školska knjiga Zagreb, 1990 (in Croatian)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<tr>
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</thead>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Acquiring basic knowledge and skills in application of calculus for single-variable functions, calculus for multi-variable functions, and ordinary differential equations.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Correctly interpret and apply single-variable calculus. Define and correctly interpret basic notions of multi-variable calculus and ordinary differential equations (ODE). Compute derivatives and some integrals of multi-variable functions, and solutions of some ODE. Compute polynomial approximations; find local extremes of single-variable and multi-variable functions by applying differential calculus. Compute some lengths, areas, and volumes by applying integral calculus. Model vibrations in simple mechanical and electrical systems by applying ODE.

#### 1.4. Course content

Applications of single-variable calculus. Multi-variable functions. Partial derivatives, differential calculus for two-variable functions and applications (approximations, local extremes, optimal control problems). Double integral and applications. First order ODE. Higher order ODE. Systems of ODE. Applications of ODE.

#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

- 

#### 1.7. Student’s obligations

Course attendance, activity/participation, mid-term exams, and tests.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity/participation, sustained knowledge check (mid-term exams, tests), and written exam.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)
1.11. Optional / additional reading (at the time of proposing study programme)

- Demidović, B. P.: Tasks and solved examples from mathematics, Tehnička knjiga, Zagreb, (in Croatian)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution's quality assurance system.
## Basic description

<table>
<thead>
<tr>
<th>Course title</th>
<th>Measurements and Quality Control</th>
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<tbody>
<tr>
<td>Study programme</td>
<td>Undergraduate University Study of Mechanical Engineering</td>
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<td>Course status</td>
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<td>ECTS student ’s workload coefficient</td>
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<tr>
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<td>Number of hours (L+E+S)</td>
</tr>
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</table>

### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Understanding the basis of measurements and quality control. The acquisition of specific skills in methods and techniques of metrology and control. Understanding trends in the development of measurement in production and science.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Interpret basic metrological concepts. Conduct basic measurements in the field of industrial metrology. Error sources in dimensional measurements and calculation uncertainty of measurement results. Analyze, compare and validate the test results. Explain the basic principles of optical measurement techniques and 3D measurement systems. Explain the basic concepts of quality control.

#### 1.4. Course content


#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

#### 1.7. Student’s obligations

Course attendance, active participation in the course, attendance at laboratory exercises, homework and independent learning.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<th>Experimental work</th>
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<td>Practice</td>
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<tr>
<td>Portfolio</td>
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</tr>
</tbody>
</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Laboratory exercises, sustained knowledge check (three midterm exams) and final written exam.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)
1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
The development of recent engineering graphics understanding and the familiarizing with computer techniques of 3 and 2D geometrical modelling.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Recognise the design process and the role of computer modelling through this process. Explain the use of geometry for the modelling. Compare and apply 3D computer techniques for 3D object modelling. Interpret parametric modelling. Apply feature modelling. Distinguish the application of 3D model data base. Organize the modelling of 3D and 2D assembly model. Estimate personal contribution and the contribution of lecturer to the acquisition of contents.

1.4. Course content

1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments
-

1.7. Student's obligations
Course attendance and activity (lectures, exercises), constructive work, continuous knowledge testing, homework, studying.

1.8. Evaluation of student's work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
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<th>Experimental work</th>
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<td>Research</td>
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</table>

1.9. Assessment and evaluation of student's work during classes and on final exam
Course attendance, homework, constructive work, continuous knowledge testing (2 exams), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)
### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<tr>
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<th>Number of students</th>
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</table>

### 1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
Basic description

**Course title**
Organization and Economics of Business Systems

**Study programme**
Undergraduate University Study of Mechanical Engineering

**Course status**
compulsory

**Year**
3.

**ECTS credits and teaching**

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</table>

1. COURSE DESCRIPTION

1.1. **Course objectives**
Assuming theoretical concepts and knowledge of the organization and business economics.

1.2. **Course enrolment requirements**
None.

1.3. **Expected course learning outcomes**
Explain the concept of business systems and building the business system. Define the basic principles of the organization. Define the management of systems and information in the enterprise. Analyze the types of organizational structures. Analyze the evaluation of jobs. Distinguish the ownership, the management and the leadership. Define the principles of management and leadership. Analyze the teamwork. Define the business policies. Describe the principles and methods of planning. Define the long-term and operational plans. Analyze network planning technique. Define the plant as an economic system. Analyze income and expenses. Distinguish the Income Statement and Balance Sheet. Define the effects of the business.

1.4. **Course content**

1.5. **Teaching methods**

<table>
<thead>
<tr>
<th></th>
<th>lectures</th>
<th>seminars and workshops</th>
<th>exercises</th>
<th>long distance education</th>
<th>fieldwork</th>
<th>individual assignment</th>
<th>multimedia and network</th>
<th>laboratories</th>
<th>mentorship</th>
<th>other</th>
</tr>
</thead>
</table>

1.6. **Comments**

1.7. **Student's obligations**
Attendance, class participation, independent learning.

1.8. **Evaluation of student's work**

<table>
<thead>
<tr>
<th>Course attendance</th>
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<th>Experimental work</th>
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<th>Report</th>
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</tbody>
</table>

1.9. **Assessment and evaluation of student's work during classes and on final exam**
Attendance, class participation, continuous assessment (two mid-term exams), written exam.

1.10. **Assigned reading (at the time of the submission of study programme proposal)**
1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

The general objective of the educational field of Physical and Health Education is to satisfy man’s biosocial need for movement through appropriate kinetic activities, thus satisfying this general need by increasing the adaptive and creative capabilities in contemporary life and work conditions.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Through appropriate kinetic activities satisfy man’s biosocial need for movement.

1.4. Course content

The course content of the educational field of Physical and Health Education shall be implemented through regular (field athletics, football, basketball, volleyball, handball, swimming and water-polo, fitness) and optional (skiing, sailing, rowing, trekking, tennis and rafting) programmes.

1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance.

1.8. Evaluation of student’s work

Course attendance  1  Activity/Participation  Seminar paper  Experimental work
Written exam  Oral exam  Essay  Research
Project  Sustained knowledge check  Report  Practice
Portfolio  1  Report  1

1.9. Assessment and evaluation of student’s work during classes and on final exam

Regular course attendance.

1.10. Assigned reading  (at the time of the submission of study programme proposal)

Medved, R.: Sports medicine, Medicinska knjiga, Zagreb. (in Croatian)
Tuka, K.: Physiology of sport, Sportska tribina, Zagreb. (in Croatian)

1.11. Optional / additional reading (at the time of proposing study programme)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<td>Medved, R.: Sports medicine, Medicinska knjiga, Zagreb. (in Croatian)</td>
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</tbody>
</table>
1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution’s Quality Assurance System.
1. COURSE DESCRIPTION

1.1. Course objectives

Student will be familiar with the processes of heat treatment and surface engineering.

1.2. Course enrolment requirements

Attended course Materials II.

1.3. Expected course learning outcomes

Analyze the basic knowledge related to the heat treatment. Analyze the transformations and basic processes of heat treatment of steel. Analyze the basic processes of heat treatment of non-ferrous metals. Analyze the surface heat treatment processes of alloys. Analyze the processes of surface engineering. Define the processes of heat treatment and surface engineering on the basis of construction and technological requirements.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

-

1.7. Student’s obligations

Course attendance, homework preparation, preparation for participation in teaching, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<td>Homework</td>
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<tr>
<td>Practice</td>
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</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, homework, preparation for participation in teaching, sustained knowledge check (two mid-term exams), written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

### 1.11. Optional / additional reading (at the time of proposing study programme)


### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<tr>
<th>Title</th>
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<tbody>
<tr>
<td>Smoljan, B., Heat treatment of steel, gray and ductile iron castings,</td>
<td>4</td>
<td>46</td>
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<td>Zagreb: Hrvatsko društvo za toplinsku obradbu i inženjerstvo površina,</td>
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<td>Udžbenici Sveučilišta u Rijeci, 1999. (in Croatian)</td>
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<td>Smoljan, B., Fundamentals of heat treatment of steel, Rijeka: Sveučilište</td>
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<td>u Rijeci, Pedagoški fakultet, 1997. (in Croatian)</td>
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<td>Krumes, D., Heat treatment, Strojarski fakultet u Slavonskom Brodu,</td>
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<td>Slavonski Brod 2000. (in Croatian)</td>
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</table>

### 1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
Assuming with basic terms and characteristics of machine tools. Ability to solve problems from machine tools simulation and tools, jigs and fixtures design for real examples. Developing working skills in small groups.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes

1.4. Course content

1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations
Course attendance, student activity on course, homeworks and independent learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, student activity on course, homework, sustained knowledge check and written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Qualification for analyzing influential factors of production. Understanding the principles of planning and production management. Knowledge of software for production management.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Define the global structure of the business system. Distinguish factors of the production function organization. Analyze organizational types of industrial production. Define quantitative methods of production. To analyze the position of the operational preparations department in the production function. Distinguish types and content of affairs of operational preparations department. Explain the organizational structure of the operational preparations department. Define the term of operational management of production. Distinguish between construction and technological documentation. Compare models and basic logic of keeping the production process. Define production planning. Explain the types and content of production plans. Distinguish methods of operational planning. Describe the basic features of the MRP II concept. Define the launch and tracking of production and inventory management. Describe the global activities of CIM and structure of integrated information systems. To analyze the features of the software for production management.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Attendance, class participation, designing two small projects, independent learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>1.5</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
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<td>Oral exam</td>
<td>Essay</td>
<td>Research</td>
</tr>
<tr>
<td>Project</td>
<td>1.5</td>
<td>Sustained knowledge check</td>
<td>Report</td>
<td>Practice</td>
</tr>
<tr>
<td>Portfolio</td>
<td></td>
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</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Attendance, class participation, presentation the solutions of two small projects, written exam.

1.10. **Assigned reading (at the time of the submission of study programme proposal)**


1.11. **Optional / additional reading (at the time of proposing study programme)**


1.12. **Number of assigned reading copies with regard to the number of students currently attending the course**

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
</tr>
</thead>
</table>

1.13. **Quality monitoring methods which ensure acquisition of output knowledge, skills and competences**

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
To teach the basics of the analyzed production technologies / processes and their implementation, and training to select the most appropriate manufacturing process due to the economic aspects and the quality of the finished product, performed calculations and specification of the technological parameters.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Identify and describe the production technology / processes and their application. To interpret the physical fundamentals of the analyzed production processes. Interpret the selection criteria of manufacturing processes. Apply basic calculations of technological parameters. To analyze the characteristics of different production processes. Assess the strengths and limitations of the various production processes with regard to the application area. Select the most appropriate process due to the economic aspects and the quality of the finished product.

1.4. Course content

1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments
Course attendance and activity, homework, control tasks, preparation and presentation of seminar, independent learning.

1.7. Student’s obligations

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written exam</td>
<td>2</td>
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<td>Project</td>
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<tr>
<td>Portfolio</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance and activity, homework, continuous assessment (three control tasks), seminar, written and / or oral examination.

1.10. Assigned reading (at the time of the submission of study programme proposal)
1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
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<tbody>
<tr>
<td>Duplančić, I.: Metal Forming Processes, Fakultet elektrotehnike, strojarstva i brodogradnje Sveučilišta u Splitu, 2007. (in Croatian)</td>
<td>2</td>
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<tr>
<td>Cukor, G.: Calculations in Metal Cutting, Tehnički fakultet Sveučilišta u Rijeci, 2014. (in Croatian)</td>
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1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution's quality assurance system.
Basic description

<table>
<thead>
<tr>
<th>Course title</th>
<th>Professional Practice I</th>
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<td>ECTS credits and teaching</td>
<td>ECTS student’s workload coefficient 5</td>
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<td></td>
<td>Number of hours (L+E+S) -</td>
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</table>

1. COURSE DESCRIPTION

1.1. Course objectives

Student verifies and complements his own expertise, along with a comprehensive view of the work process.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Apply acquired knowledge and skills from studied courses professional content. Gain working process experience. Develop and further improve competence for solving specific professional engineering problems.

1.4. Course content

Industrial practice within Undergraduate University Study of Naval Architecture is carried out individually in work organization that is engaged in the student’s field of study, and with activities in accordance with the Industrial Practice Rules and Study Program curriculum. Within such practice, student is familiarized with the corresponding jobs that are studied through programs of education, with the task of verifying and complementing their own expertise, along with a comprehensive view of the work process.

1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Conducting professional practice in duration of 15 working days, or 120 hours, and writing the corresponding report.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
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</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Assesses and evaluates student work and dedication, and written report.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)

1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
</tr>
</thead>
</table>

92
1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

The course is designed to provide the student with basic knowledge in quality assurance topics. Through exercises students are introduced with practical application of several course objectives.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

To interpret the meaning and importance of quality assurance. Explain the basic concepts of quality assurance and quality control. Classify quality characteristics of products, processes and services. Quality cost analysis. Interpret basic requirements of ISO 9001 standard. Apply basic quality tools. Assess results of statistical process control. Analyse R&R of measurement system. Measure process reliability and select acceptance sampling.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, active participation in the course, attendance at laboratory exercises, homework and independent learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<th>Experimental work</th>
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<th>Practice</th>
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<tr>
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<th>Sustained knowledge check</th>
<th>2 Report</th>
<th>Practice</th>
</tr>
</thead>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Sustained knowledge check (three midterm exams) and final written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)
1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

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<tr>
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</tbody>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

The acquisition of specific competencies dealing with the small craft building and maintenance. Acquiring the skills of independent work and developing the ability to present the achieved results.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Distinguish materials for the building of small crafts. Describe the methods for building small crafts of wood and wooden materials, plastics and metals. Describe the installation of propulsion engine with associated systems. Describe the work on the interior and exterior outfitting of small crafts. Describe the works on maintenance and repair of small crafts. Describe the places for building, maintenance and winter storage of small crafts and facilities for retrieving, lifting/launching and hauling of small crafts.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Attendance at lectures, seminar work with presentation, self learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<th>Seminar paper</th>
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</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Attendance at lectures, seminar work with presentation, written examination.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
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<tr>
<td>Pollard, S.F., Boatbuilding with Aluminum, International Marine, Camden, 1993.</td>
<td>1</td>
<td>19</td>
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</table>

1.13. Quality monitoring methods which ensure acquirement of output knowledge, skills and competences

Through the Institution's quality assurance system.
### Basic description

<table>
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<tr>
<th>Course title</th>
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<tbody>
<tr>
<td>Study programme</td>
<td>Undergraduate University Study of Mechanical Engineering</td>
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<td>Course status</td>
<td>compulsory</td>
</tr>
<tr>
<td>Year</td>
<td>1.</td>
</tr>
</tbody>
</table>
| ECTS credits and teaching | ECTS student’s workload coefficient 6  
Number of hours (L+E+S) 45+30+0 |

#### 1. COURSE DESCRIPTION

**1.1. Course objectives**

The main objectives of this course are developing the knowledge, ability and skills to solve practical problems in the field of statics of structure.

**1.2. Course enrolment requirements**

None.

**1.3. Expected course learning outcomes**

Defining apprehensions such as: force, moment of a force about a point, a couple, moment of a force about an axis. Scalar and vector quantities. Differentiate types of loads of structural elements. Solving the problems related to forces in a plane: collinear, concurrent, parallel and general force systems. Determining the resultant of several forces. Resolution of a force into components. Reduction of forces on the simpler forms. Varignon’s theorem. Determine the equilibrium conditions. Solving the problems related to forces in space: concurrent, parallel and general force systems. Determining the resultant of several forces. Resolution of a force into components. Reduction of spatial forces in a simpler form. Central axis of the spatial system of forces. Determine the equilibrium conditions. Static invariants of spatial forces. Determine the centroids of lines, areas and bodies. Solving some problems using Theorems of Pappus – Guldinus. Analysis of statically determine structures: different types of loading and support: trusses, beams frames and cables; reactions; sign convention for external and internal loading; axial, shear and moment diagrams; relations among load, shear and bending moment. Solving the problems related to friction and rolling; bodies, wedges, square – threated screws, journal and thrust bearings, wheel, belt, brakes.

**1.4. Course content**


**1.5. Teaching methods**

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

**1.6. Comments**

- 

**1.7. Student’s obligations**

Course attendance, exercises, homework, partial exams, final exam.

**1.8. Evaluation of student’s work**

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>2.5</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
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</tr>
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<td>Practice</td>
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<tr>
<td>Portfolio</td>
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<td></td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>

**1.9. Assessment and evaluation of student’s work during classes and on final exam**
Continuous knowledge testing. Written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
<th>Number of copies</th>
<th>Number of students</th>
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<tbody>
<tr>
<td>Brnić, J.: Statics (in Croatian), University of Rijeka, Faculty of Engineering, Rijeka, 2004.</td>
<td>12</td>
<td>140</td>
</tr>
</tbody>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
The main objectives of this course are developing the knowledge, ability and skills for problem solving of stress/strain analysis of structure, determination of dimensions and material of considered structure.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Define the basic assumptions and apprehensions in the strength of solid bodies. Differentiate simple and compound types of loading, stresses and strains. Define the concept of stress and strain. Analyse the behavior of engineering elements at axial loading, shear and torsion. Define Hooke's law. Calculate the extreme levels of normal and shear stresses at uniaxial and biaxial stress state. Calculate the strain and stress as well as dimensions of cross-section of engineering element subjected to: axial loading, shear, torsion. Calculate the cross-section properties. Theories of failure. Calculate the equivalent stress at compound stress state. Define types of bending of engineering elements, calculate stress and strain, analyze shear and bending moment diagrams, determine dimensions of element cross-section. Define deflection lines of beams. Calculate critical buckling loads of columns. Calculate strains and stresses at compound loadings, determine dimensions.

1.4. Course content

1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments
-

1.7. Student’s obligations
Course attendance, exercises, homework, partial exams, final exam.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
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<tr>
<td>Portfolio</td>
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</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Continuous knowledge testing. Written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)
<table>
<thead>
<tr>
<th>1.11. Optional / additional reading (at the time of proposing study programme)</th>
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</table>

| 1.12. Number of assigned reading copies with regard to the number of students currently attending the course |
|---|---|
| **Title** | **Number of copies** | **Number of students** |
| Brnić, J., Turkalj, G.: "Strength of Materials I" (in Croatian), University of Rijeka, Faculty of Engineering, Rijeka, 2004. | 15 | 140 |

<table>
<thead>
<tr>
<th>1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Through the Institution's quality assurance system.</td>
</tr>
</tbody>
</table>
1. COURSE DESCRIPTION

1.1. Course objectives

Mastering the methods and techniques of mathematical modelling and computer simulation of various technical processes. Modelling technical systems analogous to electrical systems.

1.2. Course enrolment requirements

None.

1.3. Expected course learning outcomes

Adopt the basic principles of creating mathematical models of various technical systems (mechanical, thermal, electrical, fluid flow system, etc.). Master basic use of Matlab / Simulink simulation software for model creation, simulation and system analysis. Transform the mathematical model of the system into a graphical representation using block diagrams. Display systems in the state space from the differential equation description, transfer function and block diagram description. Linearize nonlinear equations using Taylor series. Simulate different technical systems using electrical networks with operational amplifiers. Generate analytic functions by using the power series and solving differential equations.

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

-

1.7. Student’s obligations

Course attendance, work on laboratory exercises, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
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</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, work on laboratory exercises, continuous knowledge testing (three mid-term exams), written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

### 1.11. Optional / additional reading (at the time of proposing study programme)


### 1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
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<tr>
<th>Title</th>
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<tr>
<td>N.M. Karayanakis: Advanced System Modelling and Simulation With Block Diagram Languages</td>
<td>-</td>
<td>50</td>
</tr>
</tbody>
</table>

### 1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives
Introduction to fundamental concepts in the production area. Knowing the features of the process and the impact on the setting process. Positive effects of simultaneous engineering. Introduction to the elements defining and managing processes and procedures rationalization and optimization processes.

1.2. Course enrolment requirements
None.

1.3. Expected course learning outcomes
Define the basic concepts in the area of production (manufacturing process, technological process, technology, technology legality, technological discipline, machining system, production system, machining cycle, production cycle). Define the features of process and interpret their impact on the settings of process. Define the types of production and interpret the influence of the type and mode of the technological process and its settings. Explain the impact of the performance of the product in the process - technologicality. Analyse of product parts technologicality's elements.

1.4. Course content

1.5. Teaching methods
- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations
Course attendance, class participation, homework, self-learning.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Course attendance</td>
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<td>Report</td>
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<tr>
<td>Practice</td>
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</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Attendance and activity on teaching, homework, continuous assessment (three mid-term exams) and written exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
<table>
<thead>
<tr>
<th>Basic description</th>
</tr>
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<tbody>
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</tr>
<tr>
<td>ECTS credits and teaching</td>
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</tbody>
</table>

### 1. COURSE DESCRIPTION

#### 1.1. Course objectives

Introduction to technological processes in shipbuilding, capabilities and techniques of management and organization of preparatory and shipbuilding production processes, and the importance of planning the integration of various processes in shipbuilding, according to defined learning outcomes.

#### 1.2. Course enrolment requirements

None.

#### 1.3. Expected course learning outcomes

Interpret organizational features of shipbuilding processes of preparation and production. Distinguish between various shipyard processes modelling capabilities. Describe the shipbuilding processes and working areas. Interpret shipyard flexibility. To analyze the structural and technological constraints. Define the shipyard throughput. Interpret and explain the characteristics of the ship assembly process. Describe transport techniques, systems and shipyard equipment. Argue the integration of ship production processes. Analyze delivery procedures throughout production phases.

#### 1.4. Course content


#### 1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

#### 1.6. Comments

#### 1.7. Student’s obligations

Course attendance, activity, sustained knowledge check, studying.

#### 1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
<th>1.5</th>
<th>Activity/Participation</th>
<th>Seminar paper</th>
<th>Experimental work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Written exam</td>
<td>1</td>
<td>Oral exam</td>
<td>Essay</td>
<td>Research</td>
</tr>
<tr>
<td>Project</td>
<td></td>
<td>Sustained knowledge check</td>
<td>1.5 Report</td>
<td>Practice</td>
</tr>
<tr>
<td>Portfolio</td>
<td></td>
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</tr>
</tbody>
</table>

#### 1.9. Assessment and evaluation of student’s work during classes and on final exam

Course attendance, activity, sustained knowledge check (two mid-term exams), written and oral exam or their combination.

#### 1.10. Assigned reading (at the time of the submission of study programme proposal)

1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Copies</th>
<th>Students Currently Attending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lamb, T., at all</td>
<td>A Review of Technology Development. SNAME, Transactions, Vol. 103, 1995.</td>
<td>2</td>
<td>5</td>
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</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution's quality assurance system.
1. COURSE DESCRIPTION

1.1. Course objectives

Obtaining theoretical knowledge and develop skills to solve practical problems in the field of thermodynamics. Acquiring the knowledge required for attending lectures in the field of thermal and energy engineering.

1.2. Course enrolment requirements

Attended courses Mathematics I and Mathematics II.

1.3. Expected course learning outcomes

Define and describe the first and second laws of thermodynamics as well as the concept of thermal conditions. Define and describe the equation of state of an ideal gas and gas mixtures. Describe the ideal gas state changes. Describe and compare the thermal cycles. Compare and analyze the reversible and irreversible processes and define work losses due to the irreversibility. Describe state changes during evaporation and condensation. Describe, compare and analyze processes of steam plants. Describe and analyze the thermal behaviour during combustion. Describe and compare the processes of internal combustion engines. Describe and analyze the exchange of energy in the flow through the nozzle. Define, describe and compare basic types of heat transfer and describe the heat transfer within the heat exchanger. Apply acquired knowledge to numerical solving of simple heat conduction problems and interpret the results. Describe and analyze the changes and processes with humid air. Apply acquired knowledge to solve thermodynamic tasks (practical problems).

1.4. Course content


1.5. Teaching methods

- lectures
- seminars and workshops
- exercises
- long distance education
- fieldwork
- individual assignment
- multimedia and network
- laboratories
- mentorship
- other

1.6. Comments

1.7. Student’s obligations

Course attendance, activity, homework, studying.

1.8. Evaluation of student’s work

<table>
<thead>
<tr>
<th>Course attendance</th>
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<th>Seminar paper</th>
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</tr>
<tr>
<td>Project</td>
<td>Sustained knowledge check</td>
<td>2 Report</td>
<td>Practice</td>
</tr>
<tr>
<td>Portfolio</td>
<td>Homework</td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>

1.9. Assessment and evaluation of student’s work during classes and on final exam
Course attendance, activity, homework, continuous knowledge testing (three mid-term exams), written and oral exam.

1.10. Assigned reading (at the time of the submission of study programme proposal)


1.11. Optional / additional reading (at the time of proposing study programme)


1.12. Number of assigned reading copies with regard to the number of students currently attending the course

<table>
<thead>
<tr>
<th>Title</th>
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<th>Number of students</th>
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</thead>
</table>

1.13. Quality monitoring methods which ensure acquisition of output knowledge, skills and competences

Through the Institution’s quality assurance system.