<table>
<tr><td colspan="10">Faculty of Mechanical Engineering</td></tr>
<tr><td>Field of study</td><td colspan="6">Mechanics and Construction of Machinery</td><td>Degree level and programme type</td><td>Bachelor</td></tr>
<tr><td>Specialization/ diploma path</td><td colspan="6">general</td><td>Study profile</td><td></td></tr>
<tr><td rowspan="2">Course name</td><td colspan="6" rowspan="2">Additive techniques of manufacturing</td><td>Course code</td><td>IS-FME-00220S</td></tr>
<tr><td>Course type</td><td>obligatory</td></tr>
<tr><td rowspan="2">Forms and number of hours of tuition</td><td>L</td><td>C</td><td>LC</td><td>P</td><td>SW</td><td>FW</td><td>S</td><td>Semester</td><td>summer</td></tr>
<tr><td>15</td><td></td><td></td><td>30</td><td></td><td></td><td></td><td>No. of ECTS credits</td><td>3</td></tr>
<tr><td>Entry requirements</td><td colspan="9">Manufacturing Techniques I, Materials science, Cax systems</td></tr>
<tr><td>Course objectives</td><td colspan="9">Principles of Additive Manufacturing (AM). Presentation of the most important AM technologies. AM applications. Designing for AM.</td></tr>
<tr><td>Course content</td><td colspan="9">Characteristics of Additive Manufacturing. The generic AM process. Applications of Additive Manufacturing: Rapid Prototyping, Rapid Tooling, Rapid Manufacturing, Reverse Engineering. File formats for Additive Manufacturing: stl, amf, 3mf, obj. Categories of additive manufacturing processes: Vat photopolymerization, powder bed fusion, material extrusion, material jetting, binder jetting, directed energy deposition, sheet lamination. Materials used in Additive Manufacturing. Design for Additive Manufacturing.</td></tr>
<tr><td>Teaching methods</td><td colspan="9">multimedia presentations, discussion, project examples, other documents given by the teacher</td></tr>
<tr><td>Assessment method</td><td colspan="9">lecture – written exam, oral exam or test; project – performance the project</td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Learning outcomes</td><td>Reference to the learning outcomes for the field of study</td></tr>
<tr><td>LO1</td><td colspan="8">Basic knowledge of manufacturing techniques</td><td></td></tr>
<tr><td>LO2</td><td colspan="8">Basic knowledge of materials science</td><td></td></tr>
<tr><td>LO3</td><td colspan="8">practical skills needed to develop and project different elements with support of Solid Works</td><td></td></tr>
<tr><td>LO4</td><td colspan="8">Basic knowledge of modelling parts ready to preparation</td><td></td></tr>
<tr><td>Symbol of learning outcome</td><td colspan="8">Methods of assessing the learning outcomes</td><td>Type of tuition during which the outcome is assessed</td></tr>
<tr><td>LO1</td><td colspan="8">written exam, project evaluation, activity during classes</td><td></td></tr>
<tr><td>LO2</td><td colspan="8">written exam, project evaluation, activity during classes</td><td></td></tr>
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| | | | |
|---|---|---|---|
| **LO3** | **project evaluation, student activity on project classes** | | |
| **LO4** | **project evaluation, student activity on project classes** | | |
| **Student workload (in hours)** | | **No. of hours** | |
| **Calculation** | **lecture attendance** | **15** | |
| | **participation in lecture, project** | **30** | |
| | **working on projects, reports, etc.** | **20** | |
| | **participation in student-teacher sessions related to the classes /project** | **30** | |
| | **implementation of project tasks and preparation for and participation in exams/tests** | **30** | |
| | | | |
| | **TOTAL:** | **125** | |
| **Quantitative indicators** | | **HOURS** | **No. of ECTS credits** |
| **Student workload – activities that require direct teacher participation** | | **60** | **2** |
| **Student workload – practical activities** | | **65** | **2.5** |
| **Basic references** | **1. Ian Gibson, David Rosen, Brent Stucker, *Additive Manufacturing Technologies, 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing*, *Second Edition, Springer 2015***<br>**2. Andreas Gebhardt, Jan-Steffen Hötter, *Additive Manufacturing, 3D Printing for Prototyping and Manufacturing*, Carl Hanser Verlag, München 2016**<br>**3. Andreas Gebhardt, Julia Kessler, LauraThurn, *3D Printing: Understanding Additive Manufacturing*, Hanser Publications 2018** | | |
| **Supplementary references** | **1. T.S. Srivatsan, T.S. Sudarshan, Additive manufacturing: innovations, advances, and applications, Taylor & Francis, 2015** | | |
| **Organisational unit conducting the course** | **Department of Materials Engineering and Production** | **Date of issuing the programme** | |
| **Author of the programme** | **Andrzej Werner, PhD, Eng.** | **24.03.2023** | |

**L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar**