



## Advanced Technologies for Materials Processing

Version Effective from (date of when the course was developed)	2020
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ECTS Credits	2
Level/Year	5
Teaching (contact) hours	26
Total learner managed hours (incl. self-work)	66
Total hours of student learning	72

<b>Pre-requisites</b>	Students from different area (material science, mechanical engineering, physics, etc) finishing a Bachelor or in Master
<b>Co-requisites</b>	None
<b>Alignment to graduate profiles</b>	Basic knowledge of material science, mechanical engineering. At least 4 years of University level studies (technical directions) Fluent English
<b>Course aim</b>	The program aims to provide advanced techniques of materials processing and understanding the basic principles related to microstructure evolution. Additive manufacturing problems are also considered during the program in addition to technological topics.
<b>Indicative Course content</b>	The course consists of advanced topics on advanced technologies based on state-of-the-art practice-based activities in research laboratories and deep aspects of the material microstructure evolutions during processing. The examples of topics for the several lectures are listed below: <ul style="list-style-type: none"> <li>- Physics of the energy-matter interaction;</li> <li>- Advanced metrology in additive manufacturing;</li> <li>- Friction based processes and impact on microstructures and properties;</li> <li>- Microstructure and advanced physical properties;</li> <li>- Focus on steels and aluminium, nickel and titanium alloys.</li> </ul>

### LEARNING OUTCOMES

On successful completion of this course students will be able to:	
1	Work in materials processing field,
2	Basics of powder metallurgy,
3	Get familiar with equipment for additive manufacturing,
4	Study advanced techniques of additive manufacturing,
5	Develop real technological cycle

### ASSESSMENTS

Basis of assessment			
Methods of assessment	Learning Outcomes	Pass criteria (Minimum)	% Weightings
Summative review	Max score 80	40	50
Portfolio – summative of practices	Max score 20	10	50

### REQUIREMENTS FOR SUCCESSFUL COURSE COMPLETION

<b>Requirements</b>	Attend at least half lectures and practices. Final test.
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## RESULTS

<b>Assessment results</b>	Results for assessments are given in points marks
<b>Course results</b>	Students will learn advanced techniques of materials processing and understanding the basic principles related to microstructure evolution. Additive manufacturing problems are also considered during the program in addition to technological topics. The theoretical courses cover microstructure and advanced physical properties, powder metallurgy and equipment description. Students will train their practical skills during an interactive practices.

## LEARNING AND TEACHING

<b>Learning and teaching approaches</b>	Active learning, Collaborative learning, Problem-based learning, Interdisciplinary learning
<b>Learning and teaching resources</b>	Textbooks, journals and library resources; use of Internet; computer software Software requirements: <ul style="list-style-type: none"><li>• MS Teams (free access will be provided for all students),</li><li>• Microsoft Office 2007 or newer.</li></ul>
<b>Learner managed activities</b>	Completion of course work, set assignments  Reading of course materials Study group work Preparation for classes  Practicing relevant skills/methods/techniques Self-evaluation of course work Gathering relevant contextual information/ issues/ideas to build knowledge of the subject