

University POLITEHNICA of Bucharest

Faculty of Industrial Engineering & Robotics

Study programme: Industrial Engineering

Form of study: Bachelor

COURSE SPECIFICATION

Course title	MANUFACTURING PROCESSES 1	Semester	5
Course code	UPB.06.S.05.O.004	ECTS	6

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
No. of hours/ week	2	-	2	-	4
No. of hours/ semester	28	-	28	-	56

Lecturer	Lecture	Seminar	Laboratory	Project
Name, academic degree	Ș.I. dr. ing. MANOLACHE Daniel-Silviu	-	Ș.I. dr. ing. MANOLACHE Daniel-Silviu	-
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- Course description (max: 200 words): Course will provide basic knowledge related to conventional (chip removing) and non-conventional machining processes. It will provide understanding of what is involved into each machining process, how each process works and which are the elements of technological system. Firstly is presented the correlation between prescribed accuracy of the feature on drawing and machining accuracy of most common machining processes. Then are presented the basic concepts related to fundamentals of cutting: chip formation, tools geometry and materials, cutting fluids, tool life estimation. On following, are presented, in more detailed manner, the definition, tooling, machine tool and equipment, methods, movements and machining parameters of each machining process. There are presented the formulas for calculating machining time for different type of machined features. The common machining processes presented are: turning, milling, drilling, boring, broaching, shaping, gear machining. For finishing processes, like grinding, honing and lapping are presented similar elements. Also for non-conventional machining processes, like electro-discharge machining and processes using beams and jets, are presented the principles and characteristics. The characteristics of new manufacturing processes using additive technology (additive manufacturing) for obtaining products will be provided as current alternative to machining processes.

Seminar description (max: 200 words): -

Laboratory description (max. 200 words): Laboratory applications will allow to the students to achieve the practical abilities related to usage of manufacturing processes and

equipment associated to each process. It will allow to visualize how different machine tools works and how different features are obtained. Applications will show necessary setup of the workpiece on machine, what types of tools could be used and what kind of movements are performed by workpiece. Also analysis of how process parameters are influencing the quality of the feature and machining time will be performed.

Project description (max. 200 words): -

Assessment methods	Percentage of the final grade	Minimal requirements for award of credits
Written exam		<ul style="list-style-type: none"> - full laboratory attendance - total minimum 50 points
- intermediary	25	
- final	40	
Course attendance	10	
Homework	10	
Laboratory	15	

References

1. Tschätsch, H., Applied Machining Technology, Springer, 2009;
2. Klocke, F., Manufacturing Processes 1 – Cutting, Springer, 2011;
3. Bralla, J.G. ed., Handbook of Manufacturing Processes – How products, components and materials are made, Industrial Press Inc., 2007;
4. Kalpakjian, S., Manufacturing Engineering and Technology, Pearson Education, Inc., 2001;
5. Walker, J.M. ed., Handbook of Manufacturing Engineering, Marcel Dekker Inc., 1996;
6. Chang, T-C., Computer Aided Manufacturing, Prentice Hall, 1998;
7. Epureanu, Al., Pruteanu, O., Gavrilaş, I., Tehnologia construcției de mașini, Ed. Didactică și pedagogică, 1983;
8. Gavrilaş, I., Marinescu, N., Prelucrări neconvenționale în construcția de mașini, Ed. Tehnică, 1991;
9. Andrei, N., Drăgulănescu, E., Elemente tehnologice pentru prelucrări prin aşchiere, Ed. Bren, 2003

Prerequisites	Co-requisites (courses to be taken in parallel as a condition for enrolment)
Technical drawing; Tolerances Design; Materials Technology	-

Additional relevant information: -

Date: 16.05.2022