POLITEHNICA University of Bucharest (**UPB**)
Faculty of Engineering and Management of Technological Systems (**IMST**)
Study Programme: Industrial Engineering (**IE**)
Form of study: Licence (Bachelor)

COURSE SPECIFICATION

Course title:	Computer Aided Manufacturing	*Semester:*	7
Course code:	UPB.06.S.07.O.001	*Credits (ECTS):*	6

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
Number of hours per week	2		2	2	6
Number of hours per semester	28		28	28	84

Lecturer	Lecture	Seminar / Laboratory / Project
Name, academic degree	Lecturer. phd. eng. Dorel ANANIA	Lecturer. phd. eng. Dorel ANANIA
Contact (email, location)	dorel.anania@yahoo.com dorel.anania@upb.ro MSP Dept., room CE 009	MSP Dept., room CE 009 dorel.anania@yahoo.com dorel.anania@upb.ro

Course description:
Understanding fundamentals of CAM and CNC machine tools / machining centers programming and operation. Background for diploma works preparing in Industrial Engineering specialization.

Seminar / Laboratory / Project description:
Basics of NC / CNC machine tool. NC axes assignment for turning and milling machine tools and machining centers. Modular tooling system for turning and milling CNC operations: tools types, specific operations performed, tools selection, tool supports and location for CNC machine tools, necessaries movements to perform different operations. Jigs and fixtures for CNC machine tools. Modular fixture systems for part's turning and milling. CNC technology for parts manufacturing. Part machining: technology applicative works for 1-Turning, 2-Milling. Assisted and applicative study on NX CAD-CAM software package and OKUMA CNC machine tools / machining centers operation and programming specificity.

Intended learning outcomes:
Utilization of software applications and informational technologies to solve specific industrial engineering tasks. Control of the production processes and systems. Planning, control and quality assurance of the production processes and systems. Understanding fundamentals of CAM and CNC machine tools / machining centers programming and operation. Background for diploma works in Industrial Engineering specialization. Assisted and aplicative study on NX CAD-CAM software package and OKUMA CNC machine tools / machining centers operation and programming specificity.

Assessment method:	% of the final grade	Minimal requirements for award of credits
Written exam	40%	50% of total quote for exam (complete presentation for at least two subjects, or minimum 50% presentation for all three subjects of written exam)
Project	30%	100% presence on project activities, final project remittance and sustaining, 50% of total quote for project final evaluation
Homework	-	-
Laboratory	15%	100% presence on laboratory activities, remittance of each laboratory works hard copies / electronic files, presence on final laboratory evaluation, 50% of total quote for final laboratory evaluation
Other-Written test in week 8/9	15%	Presence on written test, 50% of total quote for test

References:
1. Anania F.D. Modelare-Simulare-Proiectare in domeniul Masinilor-unelte si Sistemelor de Masini, capitolul Elemente de fabricație asistata, Printech, 2014
2. Amza, C.G., Nitoi D.F, Anania, F., D., Fabricare asistata de calculator, Editura Printech, 2015
3. Catrina D., Drăghici M., Zapciu M., Enciu G., Anculete A. – Programarea mașinilor-unelte cu comandă numerică, Ed. BREN Bucuresti, 1999, ISBN 973-9493-08-
4. ***Sandvik Coromand - Turning and milling tooling system
5. ***Dassault Systems - Catia V5 - CAM
6. ***OKUMA Turning Training Manual
7. ***OKUMA Vertical Milling Center Training Manual
8. ***OKUMA Horizontal Milling Center Training Manual
9. Documentatie software CAD-CAM Cimatron E
10. Documentatie software CIMC

Prerequisites:	Co-requisites (courses to be taken in parallel as a condition for enrolment):
Technical Drawing, Tolerances Design Computer Aided Design 1 (AutoCAD) Computer Aided Design 2 (Catia V5) Manufacturing Processes 1+2, Machine tools, Robotics	None.

Additional relevant information:
Mandatory requested: - very good skills for AutoCAD (2D drafting) and CATIA V5 (part design, assembly and DMU Kinematics) operation; - assisted documents processing in Microsoft Office (Word, Excel, PowerPoint).

Date: 30.08.2016
Lecturer phd. eng. Dorel ANANIA