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

COURSE SPECIFICATION

Course title:	Advanced Production Planning and Scheduling	***Semester:***	II
Course code:	UPB.06.M2.O.02	***Credits (ECTS):***	6

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
Number of hours per week	2		2		4
Number of hours per semester	28		28		56

Lecturer	Lecture	Seminar / Laboratory / Project
Name, academic degree	Cicerone Laurentiu POPA, Lecturer Dr. Eng.	Cicerone Laurentiu POPA, Lecturer Dr. Eng.
Contact (email, location)	laur.popa79@gmail.com IMST faculty, CK110A room	laur.popa79@gmail.com IMST faculty, CK110A room

Course description:

The following topics are presented:
1. Introduction to production planning and scheduling.
2. Material Requirements Planning. Manufacturing Resource Planning. Enterprise Resource Planning.
3. Industrial projects. Advanced Production Planning and Scheduling (APPS) systems.
4. Structural elements of production systems.
5. Defining and allocation of material resources, of human resources and of equipment in industrial projects.
6. Make-to-stock and make-to-order strategies. Difference between Make-to-Order and Make-to-Stock. Pull Production and Push Production. Distributed production scheduling with limited resources. Demand variation. Strategies for dealing to deal with variety.
7. Inventory Planning. Inventory Cost. Little's law. Response Time. The waiting time.
8. Equipment's Breakdowns and equipment's maintenance. Mean Time Between Failure (MTBF). Mean Time To Repair (MTTR).
9. Production Planning and schedule analysis. Identifying and eliminating bottlenecks.
10. Work in progress (WIP) in manufacturing planning and scheduling. Resource levelling.
11. Production planning and scheduling optimization methods.
12. Productivity (The Seven Sources of Waste). Key Performance Indicators. OEE (Overall equipment effectiveness). Methods for balancing the Production Line.

Seminar / Laboratory / Project description:

The following topics are presented:
1. Defining and allocating material resources, human resources and equipment in industrial projects. Case study using Microsoft Project 2016.
2. Case study: Make-to-stock and make-to-order strategies. Case study in Witness Horizon: Pull

Production and Push Production.
3. Case study in Witness Horizon: Mean Time Between Failure and Mean Time To Repair.
4. Identifying and eliminating the bottlenecks using Witness Horizon. Resource levelling using Microsoft Project 2016.
5. Case studies regarding production planning and scheduling optimization using Witness Horizon and Microsoft Project 2016
6. Methods for balancing the Production Line (Application using Witness Horizon).

Intended learning outcomes:

Students will gain knowledge and develop competences regarding the following:

- methods and techniques of production planning and scheduling
- resource planning and production scheduling in projects specific to the field of industrial engineering
- production optimization and resource levelling in projects specific to the field of industrial engineering

Assessment method:	% of the final grade	Minimal requirements for award of credits
Written exam	40%	At least 15 points for the Laboratory At least 50 points out of a total of 100 points
Report / project	-	
Homework	-	
Laboratory	30%	
Other	30%	

References:

1. Cachon, Gerard, Christian Terwiesch, Matching Supply with Demand: An Introduction to Operations Management, 3rd edition, ISBN 978-0073525204, Irwin - McGraw Hill, 2012
2. Cotet, C.E., Popa, C.L. – Management industrial, Editura POLITEHNICA PRESS, ISBN 978-606-515-582-4, Bucureşti, 2014.
3. Cotet, C.E., Popescu, D., Popa, C.L. - Managementul fluxurilor materiale în ingineria industrială, Editura POLITEHNICA PRESS, ISBN 978-606-515-581-7, București, 2014.
3. Linea Kjellsdotter Ivert - Advanced planning and scheduling systems in manufacturing planning and control processes, ISSN 1654-9732, 2009
5. Project Management Institute - A guide to the project management body of knowledge (PMBOK® guide). -- Fifth edition, ISBN: 978-1-935589-67-9, 2013
6. Silver, E., Pyke, D., and Peterson, R., 1998, "Inventory Management and Production Planning and Scheduling," John Wiley and Sons, Third Edition
7. Microsoft Project 2016 Manual
8. Witness Horizon Manual

Prerequisites:	***Co-requisites*** ***(courses to be taken in parallel as a condition for enrolment):***
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Additional relevant information:

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Date: 09.05.2017
Professional degree, Surname, Name: Lecturer Dr. Eng. Cicerone Laurentiu POPA