University POLITEHNICA of Bucharest

Faculty of Industrial Engineering & Robotics

Study programme: Industrial Engineering

Form of study: Bachelor

COURSE SPECIFICATION

Course title	Production and Operation Management	**Semester**	6
Course code	UPB.06.S.06.O.001	**ECTS**	5

Course structure	**Lecture**	**Laboratory**	**Project**	**Total hours**
No. of hours/ week	2	1	2	5
No. of hours/ semester	28	14	28	70

Lecturer	**Lecture**	**Laboratory**	**Project**
Name, academic degree	Mădălin-Gabriel CATANĂ, Assoc. Prof. PhD. Eng.		
Contact (E-mail, location)	madalin.catana@upb.ro, CE103		

Course description

Course lectures include presentations and case studies to familiarize students with production and operation management (POM) tasks and decision making procedures for the case of manufacturing companies mainly. Main topics of the course are: scope and structure of POM tasks; master production scheduling of end-products under different production strategies and capacity constraints; material requirements planning for end-products' components under different production strategies and capacity constraints; setting the type of production for a manufacturing process; deriving detailed POM parameters for cyclic production processes by taking into account production capacity requirements, manufacturing flow strategies, and production cyclicality requirements; planning operations management parameters and daily production schedules for mass production in flow-shops; planning the sizes of production and transfer batches, the batch production cycle times, and the cycle times for batch releases in production, as well as the schedules for production of batches in job-shops; planning the size of purchase orders, the reordering periods and the purchasing schedules for the procurement of raw materials needed in production at fixed or discounted unit prices; scheduling of batch production operations in job-shops by using network-based models with generalized precedence relationships, critical path method analysis, and serial or parallel priority-rule based scheduling schemes applied in forward or backward time direction.

Laboratory description

Laboratory work implies the utilization of a spreadsheet computer software with supporting calculation forms to solve the following POM tasks: planning master production schedule for an assembled product; planning material requirements for an assembled product and setting type of production for its manufactured component parts; operations management for mass production in flow-shop; operations management for batch production in job-shop; operations management for purchasing raw materials for cyclic production of parts; scheduling batch production operations in job-shop based on priority rules.

Project description

Project work requires the utilization of a spreadsheet computer software with supporting calculation forms to solve individually formulated POM tasks regarding the case of batch production of two different component parts of an assembled product to be manufactured alternatively in a high-capacity job-shop or in a low-capacity job-shop. The best production alternative is to be selected in terms of production flow time, machine utilization ratio, and total production cost criteria.

Assessment methods	Percentage of the final grade	Minimal requirements for award of credits
Final exam	40	- Laboratory and project work completion; - Getting at least 50% of maximum grade.
Midterm exam	20	
Lecture attendance	10	
Laboratory work	10	
Project work	20	

References

1. Anil Kumar S., Suresh N., Operations Management, New Age International Publishers, New Delhi, 2009
2. Catană, M., Production and operations management: course notes, Politehnica Press, 2016
3. Catană, M., Production and operation management: support materials for course lectures, laboratory work, and project work on university e-learning portal
4. Klein R., Scheduling of Resource-Constrained Projects, Springer Science+Business Media, New York, 2000
5. Sipper D., Bulfin R., Production: Planning, Control, and Integration, McGraw-Hill, Singapore, 1998

Prerequisites	Co-requisites (courses to be taken in parallel as a condition for enrolment)
Economics, Manufacturing Processes 1, System and Project Management	-

Date: Assoc. Prof. PhD. Eng. Mădălin-Gabriel CATANĂ

01.09.2021