

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Classical and modern manufacturing systems		Code 1011102331011115176
Field of study Engineering Management - Full-time studies -	Profile of study (general academic, practical) general academic	Year /Semester 2 / 3
Elective path/specialty Production and Operations Management	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: - Laboratory: 15 Project/seminars: 15		No. of credits 4
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: dr dr hab. inż. Marek Fertsch, prof. nadzw. email: marek.fertsch@put.poznan.pl tel. tel. 061 665 34 01 Inżynierii Zarządzania ul. Strzelecka 11, 60-965 Poznań, tel. (61) 665 3374		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	The student knows the basic concepts related to the construction, design, implementation, operation of the conventional manufacturing systems in enterprises machine-building industry.
2	Skills	The student has the ability to perceive, association, interpretation of the phenomena occurring in the sphere of production and organization, both classical and modern manufacturing systems
3	Social competencies	The student understands and is ready to bear the social responsibility for decisions related to the design and implementation of traditional production systems in Polish enterprises of mechanical engineering
Assumptions and objectives of the course: To acquaint students with the essence and principles of functioning of modern manufacturing systems and features of these solutions. Mastering the students basic skills in using these solutions.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. It has an extended knowledge of organizational relationships occurring in production systems - [K2A_W04] 2. It has an extended knowledge of the internal connections of the production systems in various types of complex organizations - [K2A_W05] 3. He knows the methods and tools for process modeling information and decision-making in production systems - [K2A_W08, K2A_W09]		
Skills: 1. Can use theoretical knowledge to describe and analyze the causes and processes and social phenomena and is able to formulate their own opinions and choose critical data and methods of analysis in relation to manufacturing systems - [K2A_U02] 2. Can correctly analyze the causes and processes in the areas of manufacturing systems - [K2A_U03] 3. Has the ability to understand and analyze social phenomena, enhanced by the ability to in-depth theoretical evaluation of these phenomena in selected areas - [K2A_U06]		
Social competencies:		

1. It has a sense of responsibility for own work and a willingness to comply with the principles of teamwork and responsibility for jointly implemented tasks - [K2A_K02]
2. He can see the cause and effect in the implementation of its goals and rangować importance of alternative or competitive tasks - [K2A_K03]
3. Is aware of interdisciplinary knowledge and skills needed to solve complex problems of organization and the need to create interdisciplinary teams - [K2A_K06]

Assessment methods of study outcomes

Quality Forming:

- a) with regard to laboratories on the basis of discussions on the knowledge of the issues necessary for the proper implementation of the current exercise,
- b) for projects on the basis of an assessment of the current progress of the project,
- c) in the range of lectures based on answers to pytania dotyczące material discussed in previous lectures.

Quality Summary:

- a) for laboratories n apodstawie final report,
- b) for projects on the basis of a presentation of the task of the project and answer questions about realizacji design and solutions used in the project,
- c) in the range of lectures (1) written exam, each question is scored in a scale of 0 to 1; exam is passed after obtaining at least 55% of points, the examination can begin after completion of laboratories and projects (2) discuss the results of the exam

Course description

The lecture begins by explaining the difference between the concepts of "production system" and "production system" (production). Then discussed are the modern trends in manufacturing systems - vertical integration MRP- JiT, virtual integration of MRP-JiT, the integration of MRP-JiT through the structure of the product, virtual manufacturing. For each of the cases discussed are: structure of the production system and the corresponding variants of the structure of the control system. In class, students design the project, according to the guidelines leading selected production system.

At the laboratory classes students learn the basics of computer aided production planning and control its course in the lecture discussed solutions.

Teaching methods: conventional specialist lecture, laboratory workshop, team project of a selected production unit, work with literature

Basic bibliography:

1. Fertsch M., Pawlak N., Stachowiak A., Współczesne systemy produkcyjne, Wydawnictwo Politechniki Poznańskiej, 2011
2. Golińska P., Tradycyjne i nowoczesne systemy produkcyjne, Wydawnictwo Politechniki Poznańskiej, 2011
3. Brzeziński M., Organizacja i sterowanie produkcją. Projektowanie systemów produkcyjnych i procesów sterowania produkcją, Agencja Wydawnicza Placet, Warszawa 2002
4. Mazurczak J., Projektowanie struktur systemów produkcyjnych, Wydawnictwo Politechniki Poznańskiej, 2002

Additional bibliography:

1. Podstawy zarządzania produkcją. Ćwiczenia, Kosieradzka A., (red.), Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa, 2008
2. Boszko j., Struktura organizacyjna przedsiębiorstwa i drogi jej optymalizacji, WNT, Warszawa 1973

Result of average student's workload

Activity	Time (working hours)
1. Lecture	15
2. Projects	15
3. Laboratory	15
4. Consultation for the project	8
5. Consultation for the laboratory	8
6. Preparation for the projects	7
7. Preparation for the laboratory	15
8. Preparation for the exam	12
9. Exam	3
10. Discussion of the exam	2

Student's workload

Source of workload	hours	ECTS
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Total workload	100	4
Contact hours	66	2
Practical activities	69	2