COURSE DESCRIPTION CARD - SYLLABUS

Course name
Design of production systems [N2ZiIP2>PSP]

Course

Field of study
Management and Production Engineering

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
8

Laboratory classes
8

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

The student should have knowledge of the operation of a production company and the basic tasks of functional units in the company. He should also be able to identify processes implemented in enterprises and assess their impact on the company's operations as a whole. He should be able to assess the impact of the adopted solutions on the functioning of the production area in the enterprise. Has basic knowledge of production management.

Course objective

The aim of the course is to familiarize the student with the organization of modern production systems. Developing students' skills in analyzing, assessing, verifying and selecting variants (solutions) related to the design of production stations. Developing and shaping students' skills in solving conceptual problems and teamwork.

Course-related learning outcomes

Knowledge:
The student has structured, theoretically based, detailed knowledge related to the organization of production processes

The student has extended knowledge of designing production systems
The student has theoretically based, detailed knowledge of enterprise management and production processes
The student has structured, theoretically based knowledge of trends in improving the organization of control and supervision of production processes

Skills:
The student is able to organize production taking into account customer demand and production resources
The student is able to plan and carry out design work related to the organization of the production system.
The student is able to develop forecasts regarding the effectiveness and efficiency of production processes
The student is able to notice and identify problems occurring in systems and production processes, and select and use methods and tools appropriate to solve them.

Social competences:
The student understands the need for continuous learning; can inspire and organize the learning process of team members.
The student is able to think and act in a creative and entrepreneurial way.
The student is aware of the effects of engineering activities in both technical and non-technical areas.
The student is aware of the consequences of decisions made and responsibility for decisions made.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Knowledge and skills acquired during lectures will be verified on the basis of a colloquium including definitional and problem questions. The test consists of 8-10 open questions and 2-4 computational tasks. The passing threshold is 50%. Passing the lecture if obtaining at least 50.1% correct answers. Assignment of grades to percentage ranges of results: <90–100> very good; <80–90) good plus; <70–80) good; <60–70) satisfactory plus; <50–60) satisfactory; <0–50) unsatisfactory. Laboratory: pass based on the preparation of a
report.

Programme content

Factors determining the design of production systems. Elements of designing the production structure. Economic calculation of the application of organizational, technological and technical solutions - profitability of implementation (investment).

Course topics

Lecture: Definitions: production system, production process. Production capacity as factors determining the design of production systems. Organizational structure of production systems (form of organization, type of production, types of production structure). Design of production cells. Design of production and assembly lines. Principles of spatial organization of production systems (lay-out), infrastructure and technical equipment of production systems. Taking into account the design situation (modernization or design of new systems). Economic calculation of the use of organizational, technological and technical solutions - profitability of implementation (investment). IT systems supporting the process of designing and selecting a production system project.
Labporatory: The subject of the laboratory is to design a production system (including a production hall) for specific input data related to the range and demand for products, technological processes, and production resources. The laboratory covers topics related to the selection of production resources, balancing production capacity, adopting the type and form of production organization, and design of production space development. The laboratory also includes simulation of the production flow in a computer program.

Teaching methods

Lecture: multimedia presentation illustrated with examples, solving tasks, discussion
Laboratory: solving practical problems, teamwork, simulation, discussion.

Bibliography

Basic:
Lewandowski J., Skołud B., Plinta D., Organizacja systemów produkcyjnych, PWE, Warszawa 2014
Pająk E., Zarządzanie produkcją. Produkt, technologia, organizacja, Wydawnictwo Naukowe PWN, Warszawa 2006
Brzeziński M., Organizacja i sterowanie, AW Placet, Warszawa, 2002
Mazurczak J., Projektowanie struktur systemów produkcyjnych, WPP, Poznań, 2002
Waters D., Zarządzanie operacyjne, PWN, 2023
Zdanowicz R., Robotyzacja dyskretnych procesów produkcyjnych, WPŚ, Gliwice, 2011
Zdanowicz R., Robotyzacja procesów technologicznych, WPŚ, Gliwice, 2001

Additional:
Senger Z., Sterowanie przepływem produkcji. WPP, Poznań, 1998
Womack J. P., Jones D. T., Lean Thinking - szczupłe myślenie, ProdPress, 2008

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	18	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	32	1,50