



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Production and quality management [S1MiBM2>ZPiJ]

Course

Field of study

Mechanical Engineering

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

30

Projects/seminars

0

Number of credit points

3,00

Coordinators

dr hab. inż. Krzysztof Żywicki

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Lecturers

Prerequisites

The student should have knowledge of the basics of management, production organization, production methods, basics, metrology and mathematical statistics.

Course objective

The main goal of the course is to familiarize students with the basic areas of production operational management: production preparation, production planning and control, and methods of calculating production costs. Learning and understanding various aspects of product quality. Acquiring knowledge and skills in determining the quality capacity of the process and determining the quality level of products

Course-related learning outcomes

Knowledge:

Student knows: - characteristics of the system and production process. - elements of the production system (production structure, types of production cells). - types of production (single, small series, serial, mass). - basic forms of production organization. - basic production flow parameters. - methods of production control in various aspects of the organization of production systems. - various aspects of quality, - basics of quality control, statistical control of product quality and statistical process control -

quality management principles

Skills:

Student is able to: - design the flow of materials (production) in manufacturing processes - propose the form and structure of production organization for various types of production - predict internal and external factors affecting the adoption of specific production capacities - calculate production flow parameters - determine material requirements for the production program. - indicate critical quality features - analyze the quality capability of the process - design and use a process control card, - taking actions related to solving quality problems

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.

Tutorials: Assessment on the basis of a final test. Laboratory: pass based on the preparation of a report.

Programme content

Lecture: Definitions: production system, production process. Production capacity; factors determining production capacity planning. Organizational structure of production processes (form of organization, type of production, types of production structure). Production and operational plans. Material requirements planning MRP I, inventory model, ordering level). The concept of production control. Production control functions. Information in the control system. Information in the control system: type of information, accuracy of information. Quality-oriented design methods (FMEA). Product and process control. Statistical process control (SPC), quality capacity indicators, control charts, statistical acceptance control. Quality systems meeting the requirements of the ISO 9000 standard. Quality planning, assurance and control. Problem solving and process improvement. Economic aspects of quality management.

Tutorials: Production capacity calculation. Development of production schedules. Material requirements planning. Balancing production capacity. Material requirements planning. Development of a process map. Analysis of the causes and effects of FMEA defects. Determining the quality capability of processes and designing a process control card. Tools for solving quality problems.

Lab: Organization of the production cell. Material flow and quality control. Classes in a simulation form.

Course topics

none

Teaching methods

Lecture: multimedia presentation illustrated with examples, solving tasks, discussion

Tutorials: solving practical examples in the form of tasks and workshops.

Laboratory: solving practical problems, teamwork, simulation, discussion.

Bibliography

Basic:

Marek Brzeziński, Organizacja i sterowanie, AW Placet, Warszawa, 2002.

Lewandowski Jerzy, Skołud Bożena, Plinta Dariusz, Organizacja systemów produkcyjnych, PWE, Warszawa 2014r.

Mazurczak Jerzy, Projektowanie struktur systemów produkcyjnych, Politechnika Poznańska, Poznań, 2002.

Edward Pająk, Zarządzanie produkcją. Produkt, technologia, organizacja, PWN, Warszawa, 2006

Waters Donald, Zarządzanie operacyjne, PWN, 2019.

Hamrol A.: Zarządzanie i inżynieria jakości. Wydawnictwo Naukowe PWN, Warszawa 2023
Zymonik Z., Hamrol A., Grudowski P.: Zarządzanie jakością i bezpieczeństwem. Polskie Wydawnictwo Ekonomiczne, 2013
Banaszak Z., Kłos S., Mleczko J., Zintegrowane systemy zarządzania, PWE, Warszawa 2011r
Senger Zbigniew, Sterowanie przepływem produkcji, Wydawnictwo Politechniki Poznańskiej, 1998r.

Additional:

Januszewski A., Funkcjonalności informatycznych systemów zarządzania, PWN, Warszawa 2008.
Inżynieria zarządzania, Ireneusz Durlik, AW Placet, Warszawa, 1993

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	60	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	15	0,50