# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Organization and production control

## Course

Field of study
Management and Production Egineering
Area of study (specialization)

Level of study
Second-cycle studies
Form of study
part-time

Year/Semester
1/1
Profile of study
general academic
Course offered in
polski
Requirements
compulsory

## Number of hours

Lecture
24
Tutorials

Laboratory classes
10
Projects/seminars
8

Other (e.g. online)

## Number of credit points

6

## Lecturers

Responsible for the course/lecturer:
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Faculty of Mechanical Engineering

3 Piotrowo Stree, 61-138 Poznań

Responsible for the course/lecturer:

## Prerequisites

The student has basic knowledge in the field of production management. Student can logically associate

facts, use information obtained from available sources of knowledge. Understanding the need for learning and acquiring new knowledge.

The student should have knowledge of the role and significance of PPC (Production Planning and Control) systems used to support production planning and control as well as CAx (Computer Aided x) systems supporting the work of technologists. Is able to define the meaning of computer systems in the areas of PPC and CAx used in today's era of computerization.

## Course objective

Understanding theoretical and practical issues in the field of system organization. Familiarization with selected examples of the functionality of PPC and CAx systems as tools that increase technical, communication and logistic efficiency as well as the company's competitiveness. Understanding the basic methods of information acquisition to expand the functionality of popular computer systems, including new (proprietary) applications supporting management in the machine-building industry.

## Course-related learning outcomes

### Knowledge

The student knows: the characteristics of the system and the production process, elements of the production system (production structure, types of production cells), differences in types of production (unit, small-series, serial, mass), basic forms of production organization, basic parameters of production flow, methods of production control in various approaches organization of production systems, solutions for the automatic identification of data in the production area.

The student has basic knowledge in the field of functionality and tasks implemented by PPC (Planning Production and Control) class systems and CAx (Computer Aided) class systems as tools to increase technical-communication-logistic efficiency and competitiveness of the enterprise.

### Skills

SThe student is able to: propose the form and structure of production organization for various types of production, take into account internal and external factors affecting the adoption of specific production capacities, design elements of the production structure (form, type) and development of the production space (production cell layout), calculate production flow parameters , determine the material demand for the production program, design the production flow using the kanban system and the theory of constraints, determine the functional requirements of IT systems for managing the flow of materials in the production system, use currently available IT systems for production control. The student knows the concept of production control and is able to translate this issue into the production area (process - reaction - feedback).

### Social competences

Understands the importance of production organization for the functioning of the enterprise.

Is able to independently develop knowledge of the subject.

Understands the importance of computerization of production for the functioning of the enterprise.

The student is able to act in a managerial manner in the field of production management and engineering in the area of production control (from the "workshop" side - CAx, as well as the management side - PPC).

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

Credit based on an exam consisting of closed and open questions scored on a scale of 0-6; the exam is passed after obtaining at least 55% of points. You can take the exam after passing the laboratory, in special cases before passing the laboratory, if the lecturer finds that the student has a chance to pass the subject positively. Discussion of exam results. The exam is conducted at the end of the semester.

Laboratory:

Credit based on tasks performed during the laboratory and the final task. The student must obtain a positive assessment of the tasks completed.

Project:

Skills acquired as part of the project classes will be verified by reporting the project developed by the students (in groups) and work discussion.

## Programme content

Lecture:

1. Production System, IT System, Integrated IT System.

2. Differences between PPC and CAx systems.

3. Integration of ERP and CAx.

4. Quality Management module in ERP class systems and CAQ (Computer Aided Quality) systems for production control.

5. Selected presentations in the field of the latest IT solutions used to control production.

6. Definitions: production system, production process.

7. Production capacity; factors determining capacity planning.

8. Organizational structure of production processes (form of organization, type of production, types of production structure).

9. 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).

10. The concept of production control. Production control functions. Information in the control system. Information in the control system: type of information, accuracy of information. Production and operational plans. MRP I material demand planning, stock model, ordering level).

11. Methods inside and between cellular material flow control.

Laboratory:

Performing tasks regarding feedback FINAL PRODUCT QUALITY - PRODUCTION PROCESSES on the example of the CAQ proprietary system - KMESQ:

a) entering data

b) 1-section analysis

c) multi-department analysis

d) analysis final product quality - history of processes

Project:

The subject of the project is to design a production system for specific input data related to the range and demand for products, technological processes and production resources. The project includes the selection of production resources, the adoption of the type and form of production organization, the design of the production space and the production flow control system (material and information flow).

## Teaching methods

Lecture:

Multimedia presentation using a projector. Additional examples are drawn on the board. Solving tasks. Discussion with the group.

Laboratory:

Work at computer workstations and problem solving using the proprietary KMESQ system, ongoing consultations and explanations in the group forum using the board.

Project:

Solving practical problems, searching for sources, teamwork, discussion.

## Bibliography

Basic

1. Banaszak Z., Kłos S., Mleczko J., Integrated management systems, PWE Warsaw, 2011.

2. Lech P., Integrated management systems ERP / ERP II. Use in business, implementation, ed. DIFIN, Warsaw 2003.

3. Hamrol A., Quality management with examples. Second Edition, ed. PWN, Warsaw, 2009.

4. Perzyk M., Soroczyński A., Comparison of selected tools for creating engineering knowledge for foundry production, Archives of Foundry Engineering, Katowice, 2008, vol. 8 Issue 3.

5. Lewandowski Jerzy, Skołud Bożena, Plinta Dariusz, Organization of production systems, PWE, Warsaw 2014.

6. Waters Donald, Operational Management, PWN, 2019.

7. Senger Zbigniew, Production flow control, Poznan University of Technology Publishing House, 1998.

Additional

1. Wieczerzycki W., Databases, ed. PFE, 1994.

2. Majewski J., Information Technology for Logistics, ed. ILiM, Poznań 2000.

3. Sika R., Ignaszak Z., Implementation of the KMES Quality system for data acquisition and processing. on the example of chosen foundry, Archives of Foundry Engineering, 2008, vol. 8 Issue 3, pp. 97-102.

4. Perzyk M., Computer methods of analysis and control of production processes, METRO - Metallurgical On-Line Training, Education and Culture, Warsaw University of Technology.

## Breakdown of average student's workload

| | Hours | ECTS |
|---|---|---|
| Total workload | 100 | 6,0 |
| Classes requiring direct contact with the teacher | 50 | 2,0 |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)[1] | 100 | 4,0 |

[1] delete or add other activities as appropriate