# STUDY MODULE DESCRIPTION FORM

| Name of the module/subject | | Code |
|---|---|---|
| **Flexible Manufacturing Systems** | | **1011102211011100225** |

| Field of study | Profile of study (general academic, practical) | Year /Semester |
|---|---|---|
| **Engineering Management - Full-time studies -** | **(brak)** | **1 / 1** |
| Elective path/specialty | Subject offered in: | Course (compulsory, elective) |
| **Production and Operations Management** | **Polish** | **elective** |

| Cycle of study: | Form of study (full-time,part-time) |
|---|---|
| **Second-cycle studies** | **full-time** |

| No. of hours | | | | No. of credits |
|---|---|---|---|---|
| Lecture: **15** | Classes: **-** | Laboratory: **-** | Project/seminars: **15** | **3** |

| Status of the course in the study program (Basic, major, other) | (university-wide, from another field) |
|---|---|
| **(brak)** | **(brak)** |

| Education areas and fields of science and art | ECTS distribution (number and %) |
|---|---|
| | |

**Responsible for subject / lecturer:**

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## Prerequisites in terms of knowledge, skills and social competencies:

| | | |
|---|---|---|
| 1 | **Knowledge** | Student knows the basic concepts related to construction, design, implementation, operation of flexible manufacturing systems in the engineering industry companies. |
| 2 | **Skills** | Student has the ability to perceive, association, interpretation of the phenomena occurring in the sphere of production and organization of both conventional. |
| 3 | **Social competencies** | Student understands and is prepared to take on social responsibility for decisions related to the design and implementation |

## Assumptions and objectives of the course:

-Acquaint students with the nature, scope and methods of design and implementation of flexible manufacturing systems.

## Study outcomes and reference to the educational results for a field of study

### Knowledge:

1. He knows the general principles of organizational development in the area of flexible manufacturing systems - [[K2A_W03]]
2. He has deepened knowledge of organizational relationships especially in the area of functional subsystems of flexible manufacturing systems - [[K2A_W05]]
3. He knows the methods and tools for modeling decision making processes in the area of production systems - [[K2A_W09]]
4. He has deepened knowledge of the mechanisms of formation and alteration of production structures - [[K2A_W14, K2A_W15]]

### Skills:

1. He can make proper use of theoretical knowledge to analyze and evaluate the flexible manufacturing system - [[K2A_U02, K2A_U06]]
2. Knowledgeable of how independently propose specific solutions to the problem of the management and implementation procedures for taking decisions in this area - [[K2A_U07]]
3. Knowledgeable of how use their knowledge in various areas and forms, enhanced by a critical analysis of the effectiveness and suitability of applied knowledge - [[K2A_U03]]
4. He uses efficiently the standards, rules and criteria to create the flexible manufacturing system in the enterprise - [[K2A_U05]]

### Social competencies:

1. He has sense of responsibility for their own work and the willingness to work in accordance with the principles of teamwork and responsibility for performed jointly tasks - [[K2A_K02]]
2. He can notice depending on cause and effect in achieving the set goals and give rank of significance of alternative or competing tasks - [[K2A_K03]]
3. He is aware interdisciplinary knowledge and skills in the field of flexible manufacturing system - [[K2A_K06]]

## Assessment methods of study outcomes

Formative assessment:

a) For the project: on the basis of progress in the implementation stages of the project, and knowledge of the issues necessary to carry b) for the lecture: on the basis of answers to questions about the topics covered in previous lectures

Recapitulative assessment:

a) For the project: on the basis of (1) the quality of the project (2) answers to questions about the project b) for the lecture: on the basis of colloquium - written work on the issues discussed during the lecture. The exam can be applied after obtaining the ratings of the project . The exam is passed, after giving the correct answers to most questions

## Course description

-Flexibility
The concept and development of flexibility
Flexible automation of production
Construction of flexible manufacturing systems
Functional subsystems ESP
Machines with ESP
Position control with ESP
Auxiliaries
Designing flexible manufacturing systems
Design methods ESP
Designing functional subsystems ESP
Rating flexible manufacturing systems?
Assessment methods ESP
Evaluation of the effects of irrational ESP
The development of flexible manufacturing systems
Development of ESP in Poland
Development of ESP in the world
Teaching methods
Information lecture (conventional) (information transfer in a systematic way) monographic (specialist).
- Project method (individual or team implementation of large, multi-stage
cognitive or practical task resulting in the creation of a work).

## Basic bibliography:

1. Lis S., Santarek K.: Strzelczak S., Organizacja elastycznych systemów produkcyjnych, Państwowe Wydawnictwa Naukowe, Warszawa 1994.
2. Świć A.: Elastyczne systemy produkcyjne. Technologiczno-organizacyjne aspekty projektowania i eksploatacji. Wydawnictwo Politechniki Lubelskiej, Lublin 1998
3. Zawadzka L.: Podstawy projektowania elastycznych systemów sterowania produkcją. Problemy techniczno-ekonomiczne. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2000
4. Sawik T., Łebkowski P.: Elastyczne systemy produkcyjne, Wydawnictwo Akademii Górniczo-Hutniczej, Kraków 1992.
5. Gania, I., 2003. Elastyczne Systemy Produkcyjne, w. Logistyka Produkcji pod red. M. Fertscha Wydawnictwo ILiM, Poznań, s. 121 ? 135.

## Additional bibliography:

1. Mazurczak, J.,Gania, I., 2007. Podobieństwo jako kryterium doboru przedmiotów w elastycznych systemach produkcyjnych, W: Fertach M., Grzybowska K., Stachowiak A. (red.),.), Logistyka i zarządzanie produkcją ? nowe wyzwania, odległe granice. IIZ PP, Poznań.
2. Gania, I., Hadaś, Ł., 2007. Analiza opłacalności wdrażania elastycznych systemów produkcyjnych, W: Zarządzanie Przedsiębiorstwem / pod red. Eulalii Skawińskiej. - Poznań : Instytut Inżynierii Zarządzania Politechniki Poznańskiej, s. 283-289, (ISBN 978-83-60906-05-7).

## Result of average student's workload

| Activity | Time (working hours) |
|---|---|

| | |
|---|---|
| 1. Participation in class lecture | 15 |
| 2. Stand alone development project | 15 |
| 3. Preparing to written project | 15 |
| 4. Consultation of project | 10 |
| 5. Preparing to written exam | 15 |
| 6. Writting exam | 3 |
| 7. Explain of exam results | 2 |

| **Student's workload** | | |
|---|---|---|
| **Source of workload** | **hours** | **ECTS** |
| Total workload | 75 | 3 |
| Contact hours | 40 | 2 |
| Practical activities | 35 | 1 |