

## COURSE GUIDE

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|---|--|
| <u>Subject name</u>                         | <b>Technological resources</b>                         |
| <u>Course of study</u>                      | <b>Quality and Production Management</b>               |
| <u>The form of study</u>                    | <b>Full-time</b>                                       |
| <u>Level of qualification</u>               | <b>First</b>   |
| <u>Year</u>                                 | <b>IV</b>  |
| <u>Semester</u>                             | <b>VII</b>   |
| <u>The implementing entity</u>              | <b>Department of Production Engineering and Safety</b> |
| <u>The person responsible for preparing</u> | <b>dr inż. Krzysztof Knop</b>                          |
| <u>Profile</u>                              | <b>General academic</b>                                |
| <u>ECTS points</u>                          | <b>3</b>   |

### TYPE OF TEACHING – NUMBER OF HOURS PER SEMESTER

| LECTURE   | CLASS | LABORATORY | PROJECT   | SEMINAR |
|-----------|-------|------------|-----------|---------|
| <b>15</b> |       | -          | <b>15</b> | -       |

### COURSE AIMS

- C1. Knowledge of basic issues related to technological resources (concept and characteristics of resources, technologies, technological capabilities, know-how, intelligent technologies, technology assessment, technology readiness assessment, high-tech, technological process).
- C2. Practical application of methods of assessment of technology and technological resources.

### ENTRY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Basic knowledge of elements of the basic manufacturing process.
2. Familiarity with production management, production systems, machine operation.

### LEARNING OUTCOMES

- EU1. Student uses concepts in the field of technological resources.
- EU2. Student has the ability to evaluate technology and technological resources using specific methods.
- EU3. Student has the ability to synthesize and use knowledge from various fields of study in order to analyze and solve the problem of technological resources in the company.
- EU4. Student has the ability to use literary sources to broaden his knowledge.

### COURSE CONTENT

| Type of teaching – LECTURE  | Number of hours |
|---|-----------------|
| W1. Technological resources and its components. Technological resources as an element of the competitive potential of the company. A tool for diagnosing the competitive potential inherent in technological resources.   | 1               |
| W2. Technological resources and technological abilities. Linking the technological capability with the R & D function. Technological abilities as a key component of creating a competitive advantage. Difference between enterprises with higher and lower technological capacity. Factors determining the proper use of technological capacity and affecting its development. Assessment of technological capacity of enterprises according to K.Z. Zhou and F. Wu. Linking product innovations and technological capabilities. | 2               |
| W3. Technological resources as a product for sale. Patents, know-how. Features, examples of know-how. Know-how and business secrets. Legal protection of know-how. Contract of know-how, goods protected in the know-how contract, obligations of the supplier and recipient of know-how.   | 2               |
| W4. Definition of technology. Technology components. 4 types of technology. Objectives of technology assessment. Technology management process.   | 1               |

|  |                     |
|--|---------------------|
| W5. The importance of modernity of machines and devices in technological resources. The ABC method for the assessment of technological resources. Parker scale.  | 2                   |
| W6. Technology evaluation using STO matrix and 3x3 matrix.   | 1                   |
| W7. Technological factors in the PEST analysis. Technology readiness assessment as part of the commercialization process. TRA method.  | 1                   |
| W8. A high-tech enterprise and its features. Fields of activity as high-tech. Location factors of the high technology industry. Production phases in the high technology industry. High-tech countries. What distinguishes the best innovators?. | 1                   |
| W9. Effectiveness of technological resources.  | 1                   |
| W10. Intelligent technologies in the production area. Definition, characteristics, social dimension.   | 1                   |
| W11. Technological process and production and production. Definition, classification of processes by applied technologies. The importance of technological processes and ways to increase their efficiency.                                      | 2                   |
| <b>Type of teaching - PROJECT</b>  | <b>No. of hours</b> |
| P1. Overview of the project content and presentation of the example.   | 1                   |
| P2. Presentation and technological characteristics of machinery and equipment, characteristics of technological operations on the example of selected food business.   | 2                   |
| P3. Assessment of technological resources using the ABC method of technology using the Parker scale on the example of selected companies (in selected industries).   | 4                   |
| P4. The STO matrix (strategic technology areas) on the example of the selected enterprise.   | 3                   |
| P5. Analysis of strengths and weaknesses of technology, using 3x3 twodimensional matrix on the example of selected companies (in selected industries).   | 3                   |
| P6. Presenting and analyzing the best projects for selected companies.   | 2                   |

### TEACHING TOOLS

1. Books and monographs.
2. Audiovisual presentation.
3. Case study.

### WAYS OF ASSESSMENT (F – FORMATIVE, P – SUMMATIVE)

- F1. Evaluation of the implementation tasks in the classroom.  
 F2. Observation of students' work in the classroom.  
 P1. Final test.

### STUDENT WORKLOAD

| Form of activity  |         | Average number of hours for realization of the activity |          |      |
|---|---------|---|----------|------|
|   |         | [h]   | ECTS     | ECTS |
| Contact hours with the teacher                            | Lecture | 15  | 0.6      | 1.08 |
| Preparation for exam                                      |         | 12  | 0.48     |      |
| Contact hours with the teacher                            | Project | 15  | 0.6      | 1.08 |
| Preparation of the projects                               |         | 12  | 0.48     |      |
| Getting acquainted with the indicated literature          |         | 13  | 0.52     | 0.52 |
| Consultation  |         | 8   | 0.32     | 0.32 |
| <b>TOTAL NUMBER OF HOURS / ECTS POINTS FOR THE COURSE</b> |         | <b>75</b>   | <b>3</b> |      |

### BASIC AND SUPPLEMENTARY RESOURCE MATERIALS

#### Basic resources

1. Borkowski S., Selejdak J., Salamon S. Efektywność eksploatacji maszyn i urządzeń. Wydawnictwo Politechniki Częstochowskiej.

2. Kot S., Grondys K. Total Productive Maintenance in Enterprise Operations Support Processes. Applied Mechanics and Materials. Vol.309. 2013.
3. Lowe P. The Management of Technology: Perception and Opportunities. Chapman and Halt. London, 1995.

**Supplementary resources:**

1. Szary M., Knop K. Ocena technologii i możliwości technologicznych przedsiębiorstwa z branży metalowej, Archiwum Wiedzy Inżynierskiej, 2018, T. 3, nr 1, 31-34.
2. Borkowski S., Krynke M., Knop K. Technology Development in the Enterprise Producing Products with the Higher Quality Requirements. [in:] Kvalita a spol'ahlivost technických systemom, Slovenska pol'nohospodarska univerzita v Nitre, Nitra, 2012, pp. 31-35.
3. Mielczarek K., Krynke M. Plastic Production Machinery - the Evaluation of Effectiveness. Production Engineering Archives, 2018, 18, pp. 42-45.
4. Krynke M., Knop K., Mielczarek K. An Evaluation of Maintenance Conditions of Air Bags Sewing Machine. [w]: Borkowski S., Krynke M. (eds.) Machines Operating Conditions. Oficyna Wydawnicza Stowarzyszenia Menedżerów Jakości i Produkcji, Częstochowa, 2014.
5. Krynke M., Knop K., Mielczarek K. Analysis of the Modernity and Effectiveness of Chosen Machines in the Processing of High-Molecular Materials. Production Engineering Archives, 2014, 3, pp. 18-21.

**TEACHERS (NAME, SURNAME, E-MAIL ADDRESS)**

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**MATRIX OF LEARNING OUTCOMES REALISATION**

| Learning outcome | Reference of given outcome to outcomes defined for whole program (PRK) | Course aims | Course content | Teaching tools | Ways of assessment |
|------------------|--|-------------|----------------|----------------|--------------------|
| EU1              | K_W02, K_W05, K_U01, K_U02, K_U03, K_U04, K_U05, K_U10, K_K02          | C1, C2      | W1-W11, P1-P-6 | 1, 2, 3        | F1, F2, P1         |
| EU2              | K_W01, K_W02, K_W05, K_W09, K_U01, K_U02, K_U03, K_U04, K_U05, K_K02   | C1, C2      | W1-W11, P1-P-6 | 1, 2, 3        | F1, F2, P1         |
| EU3              | K_W01, K_W02, K_W05, K_W09, K_U01, K_U02, K_U03, K_U04, K_U05, K_K02   | C1, C2      | W1-W11, P1-P-6 | 1, 2, 3        | F1, F2, P1         |
| EU4              | K_W01, K_W02, K_W05, K_U01, K_U02, K_U03, K_K01                        | C1, C2      | W1-W11, P1-P-6 | 1, 2, 3        | F1, F2, P1         |

**FORM OF ASSESSMENT - DETAILS**

|     | grade 2   | grade 3   | grade 4  | grade 5   |
|-----|---|---|--|---|
| EU1 | Student can not use concepts in the field of technological resources.                                 | Student knows how to use selected technological concepts.   | Student knows how to use technology concepts.  | Student knows how to use technological concepts and expresses their opinion.  |
| EU2 | Student can not use specific methods to assess technology and technological resources in the company. | Student is able to use some specific methods to evaluate technology and technological resources in the company. | Student is able to precisely use specific methods to assess technology and technological resources in the company. | Student is able to use specific methods to evaluate technology and technological resources, indicate benefits and suggest directions for improvement. |
| EU3 | Student does not have the ability to synthesize and use   | Student can solve the simplest problems of  | Student is able to use the acquired knowledge to solve the problem of  | Student is able to use the acquired knowledge to properly solve the   |

|            |  |   |   |  |
|------------|--|---|---|--|
|            | knowledge from various fields of study in order to analyze and solve a problem related to technological resources. | technological resources in an enterprise                          | technological resources.  | problem of technological resources and is able to propose directions of improvement.   |
| <b>EU4</b> | Student does not have the ability to use literary sources to broaden their knowledge.                              | Student knows how to use the sources indicated by the instructor. | Student is looking for additional sources of literature to broaden his knowledge. | Student deepens his knowledge by searching for additional sources of literature, can compare the messages contained in them, draw conclusions from them. |

#### **ADDITIONAL USEFUL INFORMATION ABOUT THE COURSE**

1. Information where presentation of classes, instruction, subjects of seminars can be found, etc. - presented to students during first classes, if required by the formula classes are sent electronically to the e-mail addresses of individual dean groups.
2. Information about the place of classes - Information can be found on the website of the Faculty of Management.
3. Information about the timing of classes (day of the week / time) - Information can be found on the website of the Faculty of Management.
4. Information about the consultation (time + place) - Information can be found on the website of the Faculty of Management.