SYLLABUS

Name: Competences of manager and engineer 4.0

Name in Polish: Kompetencje menedżera i inżyniera 4.0 Name in English: Competences of manager and engineer 4.0

Information on course:

Faculty of Organisation and Management
Silesian University of Technology
Bechelor's degree, Full-time
summer semester 2023/2024
prof. PhD DSc, University Professor Małgorzata Dobrowolska

Default type of course examination report:

Delaut type of course examination report.
Credit for (grade allocation)
Language:
English
Course homepage:
https://platforma.polsl.pl/roz/
ECTS
2

Short description:

The lecture is conducted in an interactive manner, involving students in activities during the course of the lecture, including discussion, sharing opinions and experiences. The lecture is based on the Harvard Business School paradigm with the use of mini-case studies and micro presentations by students in the framework of so-called participatory teaching. During the lecture, special guests are invited from the socio-economic environment, entrepreneurs, who are not only an example of running their own business, but also experts in a given issue/module of the lecture topic

Exercises are in the nature of training of psychosocial competencies necessary in engineering work and training of managerial skills. Course assumptions:

Getting acquainted with all five psychosocial competencies, necessary in the work of an engineer, as well as leadership competencies, enabling efficient managerial work. Familiarization with the issues of the so-called competencies of the future, referring to the fourth industrial revolution. Understanding the importance of personal development in the context of own possessed professional competencies. Referring to two key transformations affecting the direction of changes in the formation of competencies - the digital and energy transformations.

Description:

- Lecture Content:
 - 1. Competence models
 - 2. Social and technological progress directions of competence changes
 - 3. Mental levels for implemented solutions of Industry 4.0. and resulting competence needs.
 - 4. Diagnostics of future competencies and their formation.
 - 5. Issues of competency 4.0.
 - 6. Work principles of organic and inorganic teams and the impact on the formation of competence
 - 7. Examples of adaptation trainings for employees using 4.0 solutions
 - 8. Examples of leadership competency 4.0 training programs.

Practice content:

- 1. Management skills training
- 2. 2. workshops on selected psychosocial skills essential for managerial work:
 - a) Communication competence
 - b) Confrontational and assertive competences
 - c) Competence in creative problem solving and creativity
 - d) Competence to deal with stress and control emotions
 - e) Negotiation competence

- 3. Psychosocial potential diagnosis and personal development planning using future competence trends in relation to digital and energy transformation
- 4. Diagnosis and development of leadership competences

Number of hours of classes with direct participation of an academic teacher: 18/9+9

Lecture: 10 hours

Exercises: 10 hours

Number of hours allocated to student's own work:

- Preparation for lecture: 5h
- Preparation for exercises: 5h
- Completion of descriptive work so called post-work: 10h
- Execution of a chosen form from those described for optional credit: 10h

Total number of hours: 50 Number of ECTS credits: 2

Number of ECTS credits obtained through direct teaching activities: 1

Bibliography:

Literature required for classes:

- 1. Dobrowolska M., Ślazyk-Sobol M., Arcienaga Morales A., Brodny J., 2021, Research and Analysis of Working Conditions in Industrial Occupations, Volum 3 Work and Industry 4.0. in the Context of Industrial Revolution, Monograph, Gliwice 2021, Wydawnictwo Politechniki Śląskiej, ISBN 978-83-757-5, s. 202,
- Poszytek P, Hyrcza-Michalska M, Brodny J, Wawrzała P, Gębal P, Lisok J, Kruszewska J, Sigurðardóttir AG, Bugnova M, Dobrowolska M. Theoretical Review of Research to Date on Competences 4.0—What Do We Know about Competences in Industry 4.0? A Status Quo Analysis. Sustainability. 2023; 15(16):12267. https://doi.org/10.3390/su151612267
- 3. Dobrowolska M, Knop L. Fit to Work in the Business Models of the Industry 4.0 Age. Sustainability. 2020; 12(12):4854. https://doi.org/10.3390/su12124854
- 4. Khang, A., Jadhav, B., & Birajdar, S. (2023). Industry Revolution 4.0: Workforce Competency Models and Designs. In Designing Workforce Management Systems for Industry 4.0 (pp. 11-34). CRC Press.
- 5. Almeida, F., & Morais, J. (2023). Strategies for developing soft skills among higher engineering courses. Journal of Education, 203(1), 103-112.

Developmental literature:

- 6. The Effects of the Big Five Personality Traits on Stress among Robot Programming Students, Pollak, A., Dobrowolska, M., Timofiejczuk, A., & Paliga, M. (2020). The Effects of the Big Five Personality Traits on Stress among Robot Programming Students. Sustainability, 12(12), 5196.
- 7. Assessment of work conditions in a production enterprise—A case study, Tutak, M., Brodny, J., & Dobrowolska, M. (2020). Assessment of work conditions in a production enterprise—A case study. Sustainability, 12(13), 5390.

Learning outcomes:

symbol	expected learning outcomes	forms of instruction	ways of verifying
	a student who has passed the course:		and assessing the learning outcome
Knowledge: kn	ows and understands		
K1A _W2	Theories and general methodology of research in management and quality sciences as well as the nature, place and importance of social sciences in engineering and managerial activities specific to the management and organization of sociotechnical systems.	Lecture / exercises	 Attendance Oral test - activity Written assessment
K1A _W4	Basic principles of creating and developing various forms of entrepreneurship, using leadership, managerial and psychosocial competences	Lecture / exercises	 Attendance Oral test - activity Written assessment

Skills: is able to					
K1A_U2	Identify, analyze and interpret social and economic phenomena and processes using knowledge in the field of social sciences and standard methods and tools of management and quality sciences in engineering management activities aimed at shaping the efficiency, productivity and organization of production enterprises.	Lecture / exercises	 Attendance Oral test - activity Written assessment 		
K1A _U7	Work individually and in a team, assuming different roles in it, plan and organize this work, as well as interact with other people as part of teamwork (also of an interdisciplinary nature) using specialist terminology and modern information and communication technologies, and take part in the debate.	Lecture / exercises	1. Attendance 2. Oral test - activity 3. Written assessment		
K1A_U11	Independently plan and implement their own lifelong learning.	Lecture / exercises	 Attendance Oral test - activity Written assessment 		
Social competence: is prepared to					
K1A_K2	Fulfilling social obligations, co-organizing activities for the social environment, initiating activities for the public interest, thinking and acting in an entrepreneurial manner.	Lecture / exercises	 Attendance Oral test - activity Written assessment 		

Assessment methods and assessment criteria:

Compulsory course credit requirements:

<u>- Attendance</u>:

1 absence is permissible, any additional absences should be excused and made up as they go along, in the form of an oral presentation of problem issues from the course in which the student was absent - after an appointment with the lecturer at a teaching consultation.

- Oral test - activity:

Activity in class, participation in discussion, substantive preparation for class (the sum of pluses makes up the activity grade). Students may receive 1 or 2 pluses in each class, depending on his/her level of engagement and presentation of self-preparation for the class. The pluses will be recorded on an ongoing basis and, at the end of the semester, the sum of the pluses will determine the marks for the oral test.

Grading criteria:

14 pluses and above = grade 5.0

13 - 11 pluses = grade 4.5

10 - 8 pluses = grade 4.0

7 - 5 pluses = grade 3.5 min. 4

pluses = grade 3.0

Knowledge check - an original written thematic paper, so-called post-work, on a topic chosen by the student.
 The following criteria will be taken into account in the assessment process:
 Correct and substantive definition of the post-work topic; Relevance of the topic to the activities, assignments and case studies

carried out in class; Correctly formulated general and specific objectives; Thematic scope and exhaustive description of the topic; Bibliographic resource and sources; Resourcefulness of the appendices.

For each criterion met, the student can obtain 1 or 2 points, so the maximum number of points to be obtained is 28.

Assessment is carried out according to the post-work written topic paper assessment scale.

Assessment criteria:

26 – 28 points = grade 5.0

23 – 25 points = grade 4.5

20 – 22 points = grade 4.0

17 – 19 points = grade 3.5

14 - 16 points = grade 3.0

min. 14 points = credit

- Micro-teaching - self-directed delivery of a talk on a lecture topic module together with a presentation of own opinion and thoughts on the topic.

Student may obtain 1 or 2 points for each criterion met, so the maximum number of points to be obtained is 22. The assessment is done according to the microlearning assessment scale.

Assessment criteria:

21 – 22 points = grade 5.0

19 – 20 points = grade 4.5

16 – 18 points = grade 4.0

14 – 15 points = grade 3.5

11 – 13 points = grade 3.0 min. 11

points = credit

Microteaching time: up to 5 minutes per speech.

Additional course credit requirements (optional):

- *Multimedia presentation* - substantive preparation of the thematic module. Multimedia presentation with a selected theoretical topic on the introduction to the ongoing microteaching activities. Duration up to 7 minutes.

Assessment criteria:

5 points = very good presentation in terms of content and methodology, creative presentation, high involvement of the student in the preparation of the presentation; grade 5.0

4 points = good presentation in terms of content and methodology, creative presentation, average student involvement in preparation of presentation; grade a 4.0

3 points = sufficient presentation in terms of content and methodology, not very creative presentation, low involvement of the student in the preparation of the presentation; grade 3.0

2 points and less = Inadequate presentation in terms of content and methodology, lack of creativity in the presentation, very low or no involvement of the student in the preparation of the presentation; grade 2.0 (presentation not passed, requiring written correction).

Written case study - testing the ability to apply knowledge in practice.
 Written test: Written project - presentation of a case study chosen by the student concerning the thematic module of the lecture.

Assessment criteria:

5 points = very good case study in terms of content and methodology, relevant to the lecture topic module, high student involvement in the preparation of the case study; grade 5.0

4 points = Good case study in terms of content and methodology, adequate for the lecture topic module, average student involvement in case study preparation; grade 4.0

3 points = Sufficient case study in terms of content and methodology, not very relevant to the lecture topic module, low student involvement in the preparation of the case study, grade 3.0

2 points and less = Inadequate case study in terms of content and methodology, inadequate for the lecture topic module, very low or no student involvement in the preparation of the case study; grade 2.0 (Written case study not passed, requiring written correction).

- Written exam consisting of 5 essay questions.

Assessment criteria:

5 points = providing correct answers to five essay questions in a comprehensive and factually correct manner; grade 5.0

4 points = providing correct answers to the four essay questions in a comprehensive and factually correct manner; grade 4.0 3 points = provide correct answers to the three essay questions in a comprehensive and factually correct manner; grade 3.0 2 points and less = providing correct answers to two or fewer descriptive questions; grade 2.0, written exam not passed, requiring written improvement.

Course grades will be determined individually with the Student in consultation, taking into account the following components:

- *attendance*, class activity, microteaching self-directed contributions to the lecture topic module with presentation of own opinion and thoughts on the topic.
- knowledge check an original written post-work on a topic chosen by the student.

and additional, optionally selected from:

- multimedia presentation theory
- written case study
- and the result of the written examination

Will therefore be the average of the component grades obtained, enhanced by the Student's self-assessment.

Practical placement:

Not applicable