POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)
pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name

THE RESEARCH CHALLENGES OF THE INDUSTRY 4.0

Course

Proposed by Discipline	Year/Semester
Management and quality studies	II/4, III/6
Type of studies	Course offered in
Doctoral School	English
Form of study	Requirements
full-time	elective

Number of hours

Lecture	Tutorials	Projects/seminars
4		

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

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Faculty of Engineering Management
Poznan University of Technology
ul. J. Rychlewskiego 2, 60-965 Poznan, Poland

Responsible for the course/lecturer:

Prerequisites

Knowledge: basic concepts in Computer Science. Understanding Human – Computer Interaction.

Skills: analytical skills. Logical reasoning. Basic IT skills.

Social competencies: communication skills. Team work.

Course objective

Present in the nutshell the overall characteristics of the 4th generation industrial revolution and its research challenges.

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Course-related learning outcomes

Knowledge

A PhD student who graduated from doctoral school knows and understands:

1) The extent that enables revision of existing paradigms - global achievements, covering theoretical basis as well as general and selected specific issues, that are characteristic to scientific disciplines studied at the doctoral school, [P8S_WG/SzD_W01]

2) Key developmental trends of science disciplines in which education takes place at the doctoral school, [P8S_WG/SzD_W02]

3) Scientific research methodology in disciplines represented at the doctoral school. [P8S_WG/SzD_W03]

Skills

A PhD student who graduated from doctoral school can:

1) Use the knowledge from different branches of science to creatively identify, formulate and to innovatively solve complex problems or to execute research tasks in particular:

- define the aim and subject of scientific research, form a research hypothesis,

- develop research methods, techniques and tools and use them creatively,

- draw conclusions on the basis of research results, [P8S_UW/SzD_U01]

2) Critically analyze and asses scientific research results, work of experts and other creative activities together with their contribution into knowledge development, [P8S_UW/SzD_U02]

3) Transfer the results of scientific activity to the economic and social sphere, [P8S_UW/SzD_U03]

4) Communicate on specialist issues at the level that allows active participation in international scientific community. [P8S_UK/SzD_U04]

Social competences

A PhD student who graduated from doctoral school is ready to:

1) Critically assess the achievements within a given scientific discipline, [P8S_KK/SzD_K01]

2) Critically evaluate their own contribution to the development of a given scientific discipline, [P8S_KK/SzD_K02]

3) Acknowledge the importance of knowledge in solving cognitive and practical problems. [P8S_KK/SzD_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

PQF code	Methods for verification of learning outcomes	Assessment criteria
W01, W02, W03	Case studies - active participation in discussion and problem solving exercises	Quality of the feedback provided; assessment of the students' work in the classroom
U01, U02, U03, U04	Project - developement of an innovative solution	Project assessment - final score

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K01, K02, K03	Readings - class discussion. Team work	Assessment of the quality of class discussion

Programme content

1. The definition and the background of the INDUSTRY 4.0 – the 4th Generation Industrial Revolution (The theoretical background for INDUSTRY 4.0, Historical evolution leading to INDUSTRY 4.0, Basic terms and concepts).

2. The review of methodologies and technologies associated with Industry 4.0 (Introduction to Artificial Intelligence (AI). Selected AI techniques, The Concept of Smart Factories and Systems, Data Exploration and Automatic Generation of Decision Rules, The Ideas of Cyber-Physical Systems and Internet of Things, Cloud Computing and Block Chains).

3. Case study analysis – application of selected advanced concepts (methodologies, technologies) to implement the concept of the INDUSTRY 4.0 (Application of Block Chains in Selected Industries, Data Exploration for Fleet Assessment).

Teaching methods

Lecture: Multimedia presentation including illustrations and examples.

Bibliography

Basic

1. Bartodziej C.: Concept Industry 4.0. Springer Verlag, Berlin – Heidelberg, 2016.

Additional

1. Gilchrist A.: Industry 4.0. The Industrial Internet of Things. Apress, New York, 2016.

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	4	0,2
Student's own work (literature studies, preparation for tutorials, project preparation, consultations with the teacher) [1]	21	0,8

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[1] delete or add other activities as appropriate