



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

ORGANIZATIONAL READINESS TO IMPLEMENT INDUSTRY OF THE FUTURE SOLUTIONS - ASSESSMENT MODELS [S5NOZIJ>GOWRPP]

### Course

Proposed by Discipline

–

Year/Semester

2/4

Level of study

Doctoral School

Course offered in

English

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

4

Laboratory classes

0

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

1,00

### Coordinators

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### Lecturers

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### Prerequisites

Basic knowledge of organizational management, process management, innovation, or digital transformation. Knowledge of the fundamental concepts related to Industry 4.0, including the Industry 4.0 concept and associated technologies. Familiarity with the concept of Industry 5.0 and related technologies, as well as key technological and organizational trends.

### Course objective

The aim of the course is to familiarize doctoral students with the concept of assessing organizational readiness and maturity for the implementation of Industry of the Future solutions, and to develop their ability to critically analyze and select assessment models appropriate to a specific research or practical problem. The course is intended to enable participants to: 1. understand the differences between the concepts of organizational readiness, maturity, and transformation; 2. become familiar with the structure and principles of applying selected readiness and maturity assessment models; 3. identify key organizational, technological, and social dimensions determining an organization's capacity for transformation; 4. compare assessment models in terms of their scope, methodology, measurement approach, and potential applications; 5. critically assess the limitations of maturity models and the results obtained through their application; 6. use assessment results to identify maturity gaps and formulate directions for further organizational transformation.

### Course-related learning outcomes

#### Knowledge:

knows and understands the concept of organizational readiness and maturity in the context of transformations related to Industry 4.0, Industry 5.0 and the Industry of the Future, and characterizes selected organizational readiness assessment models (P8S\_WG/SzD\_W01)

knows and understands the main development trends in approaches to assessing organizational readiness and maturity, including the evolution from a focus on technology and digitalization towards approaches that also consider organizational, social and environmental factors, as well as organizational resilience (P8S\_WG/SzD\_W02)

#### Skills:

can apply knowledge from the fields of management, technology, organization and digital transformation to identify and analyze factors determining an organization's readiness to implement Industry of the Future solutions (P8S\_UW/SzD\_U01)

can critically analyze and compare organizational readiness and maturity assessment models, taking into account their assumptions, dimensions, measurement methods, potential applications and methodological limitations (P8S\_UW/SzD\_U02).

#### Social competences:

is ready to critically assess concepts, models and research findings concerning organizational readiness and maturity for transformation (P8S\_KK/SzD\_K01)

is ready to recognize the importance of scientific knowledge and appropriately selected diagnostic methods in solving cognitive and practical problems related to organizational transformation (P8S\_KK/SzD\_K03).

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The basis for passing the course is active participation in classes and the preparation of a short individual analytical paper concerning a selected organizational readiness or maturity assessment model, or a comparison of two selected models.

The paper should include a characterization of the model's assumptions, an analysis of its dimensions and assessment method, identification of possible areas of application, and a critical evaluation of its strengths and limitations.

The assessment criteria include: substantive accuracy, the ability to conduct critical analysis, appropriate use of scientific literature, quality of argumentation, and the relevance of the conclusions formulated.

A passing grade requires demonstration of the achievement of the intended learning outcomes at least at a satisfactory level.

### Programme content

The concept of the Industry of the Future and the evolution from Industry 4.0 to Industry 5.0.

The concepts of organizational readiness, digital maturity, organizational maturity, and organizational transformation capabilities.

Maturity models as diagnostic and research tools – their origins, structure, and design principles.

Dimensions of organizational readiness assessment: strategy and leadership, technologies, infrastructure and information systems, data, processes, products and services, work organization, organizational culture, employee competencies, and relationships with the external environment.

Maturity levels, indicators, measurement scales, aggregation of results, self-assessment, expert assessment, and benchmarking.

Selected models for assessing organizational readiness and maturity for Industry 4.0, in particular IMPULS Industrie 4.0 Readiness, the acatech Industrie 4.0 Maturity Index, and the Smart Industry Readiness Index. Comparison of models and criteria for selecting an appropriate model for research and practical purposes. Interpretation of assessment results, maturity gap analysis, and the use of diagnostic results to develop transformation roadmaps.

Limitations of maturity models: subjectivity of assessment, aggregation of indicators, dependence on organizational context, issues of model validation and currency, and limited comparability of results.

Extending organizational readiness assessment to include the Industry 5.0 perspective: human-centricity, resilience, and sustainability.

### Course topics

Organizational readiness for the Industry of the Future – conceptual foundations – 1 hour  
Industry 4.0, Industry 5.0 and the Industry of the Future. Digital transformation of organizations. Readiness versus maturity. The multidimensional nature of organizational transformation. Technological, organizational and human factors.

Models for assessing organizational readiness and maturity – structure and methodology – 1 hour  
The concept and purpose of maturity models. Dimensions, levels and indicators of maturity. Methods of data collection and aggregation of results. Self-assessment, expert audit and benchmarking. Issues related to model reliability, comparability and validation.

Selected Industry 4.0 readiness and maturity models – comparative analysis – 1 hour  
IMPULS Industrie 4.0 Readiness, acatech Industrie 4.0 Maturity Index, Smart Industry Readiness Index, and examples of models developed in the scientific literature. Comparison of their scope, dimensions, maturity levels and potential applications.

From diagnosis to organizational transformation – 1 hour

Interpretation of assessment results. Identification of maturity gaps. Prioritization of actions and development of transformation roadmaps. Selection of an assessment model appropriate to the research objective. Critical analysis of maturity models. Development trends in assessment methods in the context of Industry 5.0, artificial intelligence, resilience and sustainability.

### Teaching methods

A problem-oriented lecture supported by multimedia presentations, examples of the application of maturity assessment models, and short case studies.

Comparative analysis of selected organizational readiness and maturity models.

Moderated discussion on the opportunities and limitations of using maturity models in scientific research and business practice.

Elements of case study analysis and problem-based learning, involving the selection of an appropriate assessment model for an example organizational context.

### Bibliography

1. Schuh G., Anderl R., Dumitrescu R., Krüger A., ten Hompel M. (2020), Industrie 4.0 Maturity Index. Managing the Digital Transformation of Companies – Update 2020, acatech – National Academy of Science and Engineering.
2. Lichtblau K., Stich V., Bertenrath R., Blum M., Bleider M., Millack A., Schmitt K., Schmitz E., Schröter M. (2015), Industrie 4.0 Readiness, IMPULS-Stiftung des VDMA, Aachen–Köln
3. Schumacher A., Erol S., Sihn W. (2016), “A Maturity Model for Assessing Industry 4.0 Readiness and Maturity of Manufacturing Enterprises”, *Procedia CIRP*, 52, 161–166
4. Mittal S., Khan M.A., Romero D., Wuest T. (2018), “A Critical Review of Smart Manufacturing & Industry 4.0 Maturity Models: Implications for Small and Medium-sized Enterprises (SMEs)”, *Journal of Manufacturing Systems*, 49, 194–214

### Breakdown of average student's workload

|                                                                                                                                                 | Hours | ECTS |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| Total workload                                                                                                                                  | 25    | 1,00 |
| Classes requiring direct contact with the teacher                                                                                               | 4     | 0,00 |
| Doctoral student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) | 21    | 1,00 |