

Course description

Course abbreviation:	KPV/APSA	Page:	1 / 3
Course name:	Applicat. of Industry 4.0 in Mech. Eng.		
Academic Year:	2023/2024	Printed:	03.06.2024 10:17

Department/Unit /	KPV / APSA			Academic Year	2023/2024
Title	Applicat. of Industry 4.0 in Mech. Eng.			Type of completion	Exam
Long Title	Applications of Industry 4.0 in Mechanical Engineering				
Accredited/Credits	Yes, 4 Cred.			Type of completion	Combined
Number of hours	Lecture 2 [Hours/Week] Tutorial 2 [Hours/Week]				
Occ/max	Status A	Status B	Status C	Course credit prior to	YES
Summer semester	0 / -	0 / -	0 / -	Counted into average	YES
Winter semester	0 / -	0 / -	0 / -	Min. (B+C) students	10
Timetable	Yes			Repeated registration	NO
Language of instruction	English			Semester taught	Winter semester
Optional course	Yes			Internship duration	0
Evaluation scale	1 2 3 4			Ev. sc. – cred.	S N
No. of hours of on-premise					
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.				
Periodicity	K				
Substituted course	KPV/APS				
Preclusive courses	N/A				
Prerequisite courses	N/A				
Informally recommended courses	N/A				
Courses depending on this Course	N/A				

Course objectives:

The course focuses on following areas: industry 4.0 principles, tools and methods in the context of Society 4.0, internet of things, horizontal and vertical integration of software application with the key role of ERP systems, virtual and augmented reality. Student will receive information for practical innovation project of business products and processes. They will also receive rules for evaluation of industry 4.0 projects benefits and trends (security, legislative, environmental, etc.)

Requirements on student

Individual project presentation
Written test

Content

The main focus of the course is on the basic platform of the Internet of Things, on the horizontal and vertical integration of software applications with a key position of ERP systems and on the use of virtual and augmented reality.

1. Society 4.0 trends
2. development of enterprises towards industry 4.0
3. technological trends - Internet of Things, automation of business processes - I.
4. technological trends - Internet of Things, automation of business processes - II.
5. horizontal and vertical integration in enterprises with key role of ERP systems
6. virtual and augmented reality - I.
7. virtual and augmented reality - II.
8. industry 4.0 readiness auditing in enterprises
9. innovation of enterprise in context of industry 4.0
10. industry 4.0 innovation project and the way of its evaluation - I.
11. industry 4.0 innovation project and the way of its evaluation - II.
12. industry 4.0 innovation project and the way of its evaluation - III.
13. main aspects of industry 4.0 development in enterprises - security, legislative, environmental

<https://portal.zcu.cz/StagPortletsJSR168/CleanUrl?urlid=prohlizeni-predmet-sylabus&predmetZkrPrac=KPV&predmetZkrPred=APSA&predmetRok=2021&predmetSemestr=ZS>

Fields of study

Guarantors and lecturers

- **Guarantors:** Prof. Ing. Josef Basl, CSc. (100%)
- **Lecturer:** Prof. Ing. Josef Basl, CSc. (100%)
- **Tutorial lecturer:** Prof. Ing. Josef Basl, CSc. (100%)

Literature

- **Basic:** Gilchrist, Alasdair. *Industry 4.0: The Industrial Internet of Things*.
- **Basic:** Schwab, Klaus. *The Fourth Industrial Revolution*.
- **Extending:** Ustundag, Alp, Cevikcan, Emre. *Industry 4.0: Managing The Digital Transformation*. Springer, 2018. ISBN 978-3-319-57870-5.
- **Recommended:** Yáñez, Fran. *The goal is Industry 4.0 technologies and trends of the fourth industrial revolution*. 2017. ISBN 978-1-973413-17-2.

Time requirements

All forms of study

Activities	Time requirements for activity [h]
Preparation for an examination (30-60)	20
Individual project (40)	30
Presentation preparation (report) (1-10)	10
Contact hours	52
Total:	112

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

Combined exam

Skills - skills achieved by taking this course are verified by the following means:

Combined exam

Project

Competences - competence achieved by taking this course are verified by the following means:

Combined exam

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

knowledge of methods and tools from enterprise information systems, innovation management, project management, process management, robotics and internet of things is welcome
there are no special needs to enter this subject

Skills - students are expected to possess the following skills before the course commences to finish it successfully:

ability to identify the new IT potential in enterprises
ability to analyse trends - technological, political, demographic, environmental, security

Competences - students are expected to possess the following competences before the course commences to finish it successfully:

N/A

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Lecture supplemented with a discussion

Project-based instruction

Skills - the following training methods are used to achieve the required skills:

Project-based instruction

Competences - the following training methods are used to achieve the required competences:

Lecture supplemented with a discussion

learning outcomes

Knowledge - knowledge resulting from the course:

describe the development and trends in the field of applied technologies for industry 4.0 in companies

identify opportunities for new industry 4.0 trends for the enterprise

formulate a project of product and process innovation for the implementation of industry 4.0 in the company

evaluate the benefits and risks of implementing industry 4.0 projects in the company

Skills - skills resulting from the course:

analyze the innovation potential of Industry 4.0 for the enterprise

to design an innovation project for a selected area of the company towards industry 4.0

Competences - competences resulting from the course:

N/A

Course is included in study programmes:

Study Programme	Type of	Form of	Branch	Stage	St. plan v.	Year	Block	Status	R.year	R.
Design of Power Machines and Equipment	Postgraduate Master	Full-time	Digital Manufacturing	1	2021	2023	Compulsory courses	A	1	ZS
Design of Power Machines and Equipment	Postgraduate Master	Full-time	Manufacturing Machines and Technologies	1	2021	2023	Compulsory courses	A	1	ZS