COURSE DESCRIPTION CARD - SYLLABUS

Course name
Designing of logistics systems & processes [S2Log2E>PSiPL]

Course

Field of study
Logistics

Year/Semester
1/1

Area of study (specialization)
Logistics Systems

Profile of study
general academic

Level of study
second-cycle

Course offered in
english

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
15

Other (e.g. online)
0

Tutorials
0

Projects/seminars
15

Number of credit points

4,00

Coordinators

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Lecturers

dr hab. inż. Paweł Pawlewski prof. PP
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Prerequisites

The student has extensive knowledge of the use of logistics processes in the design of enterprise integration methods, simulation technologies, methods of streamlining and improving processes, has knowledge of available simulation packages, knows the concepts of process verification using simulation experiments, has knowledge of methods and techniques of process improvement

Course objective

Acquiring skills and competences in designing an enterprise's logistics system, understanding the basic methods used in designing logistics systems, designing and managing economic processes.

Course-related learning outcomes

Knowledge:
1.knows the relationships governing the design of logistics systems and processes [P7S_WG_01]
2. knows the issues of process mapping, process orientation in logistics and process simulation used in the design of logistics systems and processes [P7S_WG_03]
3. knows extended issues related to the life cycle of logistics systems and processes and the life cycle of industrial products [P7S_WG_06]

4. knows detailed methods, tools and techniques specific to the design of logistics systems and processes [P7S_WK_01]
5. knows phenomena and contemporary trends characteristic of the design of logistics systems and processes, including industry 4.0 and artificial intelligence [P7S_WK_03]

Skills:
1. is able to collect, based on the literature on the subject and other sources (in Polish and English), and present in an orderly manner information regarding the design of logistics systems and processes, also at the supply chain level [P7S_UW_01]
2. is able to communicate using appropriately selected means in a professional environment and in other environments as part of the design of logistics systems and processes, also at the supply chain level [P7S_UW_02]
3. is able to critically analyze the technical solutions used in the analyzed logistics system (in particular in relation to devices, facilities and processes)[P7S_UW_04]
4. is able to design, using Industry 4.0 methods and techniques, an object, system and logistics process as well as processes related to them, along with determining the path of its implementation and implementation, potential threats or limitations in this respect [P7S_UW_05]
5. is able to identify changes in requirements, standards, regulations, technical progress and labor market reality, and on their basis determine the needs to supplement own and other knowledge [P7S_UU_01]

Social competences:
1. recognizes the cause-and-effect relationships in achieving the set goals and grading the significance of alternative or competitive tasks [P7S_KK_01]
2. is aware of the responsibility for own work and willingness to comply with the principles of teamwork and taking responsibility for jointly implemented tasks [P7S_KR_01]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
- in the area of lectures - presence and activity during classes
- in the area of laboratories - discussion of the implemented model
Summative rating:
- in the field of lectures - written exam, passing the 50% mark
- in the area of laboratories - presentation and passing the simulation model, passing the 50% points

Programme content

Systemic approach to logistics. Logistics system design. Methods used in designing logistics systems. Functional and process orientation in enterprise management. Process attributes (parameters), process metrics in the context of the enterprise's logistics system and supply chain, Process metrics as the basis for process management. Process life cycle. Implementation and financial aspects - management of goals, resources, efficiency. Measuring effectiveness and efficiency. Process design methodology using computer simulation. The use of industry 4.0 techniques and technologies in the design of logistics processes, including the Internet of Things. Methods of designing and improving logistics processes using digital twins and artificial intelligence technology. Specificity of process design in hospitals. Process design context - ERP systems including SAP.

Teaching methods

Lectures - informative lecture (conventional) (transfer of information in a systematic way)?
may be of course (propedeutic) or monographic (specialist) character
Laboratories - Laboratory method (experiment) (independent conducting of experiments by students)

Bibliography

Basic:
1. Pawlewski P., „METHODOLOGY FOR LAYOUT AND INTRALOGISTICS REDESIGN USING SIMULATION2018 Winter Simulation Conference (WSC), Gothenburg, Sweden, 2018, pp. 3193-3204.
2. Pawlewski P., Symulacja wsparciem dla Lean, Kaizen (37), nr 2, kwiecień,-maj 2019, pp. 32-37.

3. Pawlewski P., „Built-In Lean Management Tools in Simulation Modeling," 2019 Winter Simulation Conference (WSC), National Harbor, MD, USA, 2019, pp. 2665-2676.
4. Pawlewski P., „Using PFEP For Simulation Modeling of Production Systems", Procedia Manufacturing, Volume 17, 2018, Pages 811-818
5. Pawlewski P., 7 rzeczy dla milk-run, Kaizen (38), nr 3, czerwiec-lipiec 2019, pp. 43-47.

Additional:
1. Greenwood A.G., Kluska K., Pawlewski P., A Multi-level Framework for Simulating Milk-Run, In-plant Logistics Operations. In: Bajo J. et al. (eds) Highlights of Practical Applications of Cyber-Physical Multi-Agent Systems. PAAMS 2017. Communications in Computer and Information Science, vol 722. Springer, Cham
2. Kluska K., Pawlewski P., „The use of simulation in the design of Milk-Run intralogistics systems", IFAC-PapersOnLine, Volume 51, Issue 11, 2018, Pages 1428-1433
3. Cempel Cz., Teoria i inżynieria systemów, Instytut Technologii Eksploatacji - PIB/2008

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	55	2,00