COURSE DESCRIPTION CARD - SYLLABUS

Course name
Transportation Systems Management

Course

Field of study
Logistics
Area of study (specialization)
Logistics Systems
Level of study
Second-cycle studies
Form of study
full-time

Year/Semester
1/2
Profile of study
general academic
Course offered in
English
Requirements
elective

Number of hours

Lecture
30
Laboratory classes
Other (e.g. online)
Tutorials
Projects/seminars
30

Number of credit points

5

Lecturers

Responsible for the course/lecturer:
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Faculty of Engineering Management

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Responsible for the course/lecturer:

Prerequisites

Student has a basic background in transportation, logistics and management. He/ she can carry out analytical tasks and manage projects as well as apply basic management tools and methods in transportation and logistics. He/ she is able to perform a team work.

Course objective

To familiarize students with the basic concepts and terms associated with transportation and transportation systems. Provide rules and tools/ methods to design, evaluate and manage Transportation Systems.

Course-related learning outcomes

Knowledge

1. Student knows dependencies in the given area and their relations with logistics [P7S_WG_01]

2. Student knows issues in the field of production engineering and its connections with the field of transportation and logistics [P7S_WG_02]

3. Student knows extended concepts for logistics and its specific issues and supply chain management [P7S_WG_05]

4. Student knows the detailed methods, tools and techniques characteristic of the studied subject in logistics [P7S_WK_01]

Skills

1. Based on the literature review and analysis of other sources of information, student can collect and provide, in an orderly manner, information on the problem within the framework of logistics and its specific issues and supply chain management [P7S_UW_01]

2. Student can design, using appropriate methods and techniques, the object, system or logistic process and the process associated with it including defining the path of its implementation and potential threats or limitations in analyzed domain [P7S_UW_05]

3. Student is able to design, using properly selected means, an experiment, analytical process or scientific research project/ program solving a problem within logistics and its specific issues as well as supply chain management [P7S_UK_01]

4. Student can identify changes in requirements, standards, regulations, technological development and behaviour of the labor market. Based on their recognition he/she is able to determine the needs to extend and enhance his/ her own and others' knowledge [P7S_UU_01]

Social competences

1. Student is responsible for his/ her own work and ready to comply with the rules of working in a team and taking responsibility for the tasks carried out jointly [P7S_KR_01]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE:

- formative assessment: homeworks, discussions summarizing individual lectures, giving the student the opportunity to assess the understanding of the problem, active participation in lectures

- final grade/ assessment: 45 minute, written exam in the subject , test composed of 25 questions (closed and open); satisfactory threshold - 50%.

PROJECT:

- formative assessment: assessment of class activities, active participation in classes

- final assessment: grading the project in the field of decision making and aiding in logistics, evaluation of the student's skills in mathematical modeling of the decision problem and his/ her ability to perform computational experiments

Programme content

1. Introduction to the topic. The definition of transportation, transportation systems and transportation systems management. Content of the lecture and characteristics of the projects.

2. Definition and basic characteristics of Transportation Systems. Major components of Transportation Systems and their description. Classification of Transportation Systems. Single-mode and multimodal Transportation Systems.

3. System Approach for Transportation Systems Analysis. Transportation System as an object. Passengers' vs. Freight Transportation Systems.

4. Description, basic features and existing interactions between basic elements of Transportation Systems: Infrastructure, Fleeet, People (Crew), Rules/ Regulations, Processes.

5. Presentation of different infrastructural solutions in Transportation Systems. Linear and Point infrastructure. Analysis of road-, railway-, sea- and air- transportation infrastructure.

6. Characteristics of different categories of fleet operating in Transportation Systems. Analysis of fleet operating in road-, railway-, sea- and air- Transportation Systems.

7. Description of crews serving Transportation Systems and rules/ regulations controling the operations of Transportation Systems. Analysis concerning road-, railway-, sea- and air- Transportation Systems.

8. Basic processes (business and technological) carried out in Transportation Systems. Process analysis of selected transportation processes.

9. Major decision problems arising in Transportation Systems - their features and solution procedures. Classification of transportation decision problems.

10. Solving selected categories of decision/ management problems arising in Transportation Systems: network design, location analysis, fleet composition, crew assignment and scheduling, customer service.

11. Principles of Transportation System design, management and evaluation. Selection of Transportation Systems to be designed and evaluated within the projects. Desription of the available tools and methods (e.g. Visum, Vissim).

12. Transportation Systems development: land use desgn, infrastructure development, implementation of management rules, information provision, design of pricing strategies.

13. Stages of Transportation System design/development: analysis of transportation demand, design of a transportation network, traffic assignment, definition of transportation modes (types of vehicles), allocation of crews. The principles of a 4-stage model.

14. Intelligent Transportation Systems (ITS). Basic concepts and features. Selected examples of ITS-s world wide.

15. Case study analysis. Cases concerning design, operations and management of selected Transportation Systems.

Teaching methods

Lecture: conversatory lecture; interactive discussion; case studies

Project: project method. Practical analysis of the decision problem. Computational experiments.

Bibliography

Basic

Bierlaire M. et al. (Eds.): Integrated Transport and Land Use Modeling for Sustainable Cities. Routledge, New York, 2014.

Hensher D., Button K. (Eds.): Handbook of Transport Modelling. Pergamon, Amsterdam – New York – Tokyo, 2005.

Daganzo C.: Fundamentals of Transportation and Traffic Operations. Pergamon Press, New York, 1997.

Additional

Tumlin J.: Sustainable Transportation Planning. Tools for Creating Vibrant, Healthy, and Resilient Communities. Wiley, San Francisco – Toronto, 2012.

Żak J., Hadas Y., Rossi R.(Eds.): Advanced Concepts, Methodologies and Technologies for Transportation and Logistics. Springer, Heidelberg, 2018.

Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,0
Classes requiring direct contact with the teacher	60	2,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	65	2,5

[1] delete or add other activities as appropriate