Syllabus

Management of Urban Infrastructures

(8 ECTS)

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1. Course Description

a) Pre-requisites

There are no formal prerequisites for this course. Students should have fluent English and be acquainted with conceptual and terminological features of the main frameworks in public administration and urban governance.

b) Abstract

This blended learning course explores important issues in the development and application of fundamental considerations for city managers in managing urban infrastructures. The aim of the course is to provide students with an understanding of concepts of Sustainability, Resilience and Efficiency. The online incorporated in this syllabus is Management of Urban Infrastructures MOOC, Coursera (https://www.coursera.org/learn/managing-urban-infrastructures-1).

Today, more than 3.9 billion people, making up more than 54% of the global population, live in cities. Urbanization is expected to continue in the coming years, raising the urban population to 6.0 billion by 2045. This dramatic increase in urban populations will inevitably increase the demand for energy, mobility (transportation), water, and other urban services in every city around the world. Without functional governance and management structures that ensure efficient, resilient and sustainable performance in cities, the current urbanization growth might become a catastrophic risk threatening the quality of life of the humanity.

Sustainable development in 21st century can only be realized by introducing innovations in both management and operations of urban infrastructures systems. Developing management practices that effectively integrates the processes of urban planning with urban infrastructures planning and management is a challenging goal that many cities are struggling with nowadays, but is a must for transforming cities to sustainable and resilient engines of growth in both developing and developed economies.

2. Learning Objectives

This course introduces students to the concepts of sustainability in relation to the urgent issues of urban management and urban governance. It discusses problems of environmental challenges and infrastructural changes in contemporary cities. The course explores the basic principles of urban infrastructure management that are fundamental for building prosperous cities that are sustainable, resilient and efficient. It aims to develop critical knowledge and understanding of contemporary urban governance and its future modes of development.

3. Learning Outcomes

Through the application of course content, students are encouraged to:

- Demonstrate in-depth knowledge of the main environmental problems in their relation to urban management and urban innovation;
- Critically understand the differences between contemporary urban practices in innovation, sustainability, equity and connectedness;
- Articulate a theoretically informed interpretation of the principles of urban infrastructure management;
- Identify several contemporary processes of urban infrastructure management;
- Review competing models for the management of the urban environment and urban infrastructures;
- Communicate effectively in writing and orally on course topics to an audience consisting of both peers and more senior specialists.

4. Course Plan

Structure of the Course					
№	**Topic**	**Total**	**Directed Study**		**Self-directed Study**
			Lectures	**Seminars**	
1	Urban environmental issues (offline)	80	6	14	60
2	Urban management and urban infrastructures (online)	120	-	-	120
3	The Future of Urban Infrastructures (offline)	104	6	14	84
Total study hours		**304**	**12**	**28**	**264**

Course Content

Part I. Urban environmental issues (offline)

a. Introduction to the course.
b. Key environmental problems, urban management and urban innovation.
c. Best urban practices in innovation, sustainability, equity and connectedness.
d. Key stakeholders of urban development, and strategies of collaboration.

Part II. Urban management and urban infrastructures (online)

a. Introduction to urban infrastructures.
b. Introduction to principles of urban infrastructure management.
c. Introduction to urban energy management.
d. Introduction to urban transport management.

Part III. The future of urban infrastructures (offline)

a. The role of public management in urban development.
b. New city standards and indicators: sustainability, quality of life, and digitalization.
c. Urban analytics for management of the urban environment.
d. Concluding workshop (final in-class presentations).

5. Reading List

Mandatory

Song, H., & edited by Houbing Song, R. S. T. S. and S. J. (2017). *Smart cities : foundations, principles, and applications*. Hoboken, NJ: John Wiley & Sons, Inc.

MOOC Management of urban infrastructures Reading list (https://www.coursera.org/learn/managing-urban-infrastructures-1)

Ferrer, A.L.C., Thomé, A. M. T., Scavarda, A.J. (2018). Sustainable urban infrastructure: A review. *Resources, Conservation and Recycling*, 128, 360-372.

Optional

Allegrini J., Dorer V., & Carmeliet J. (2012). Influence of the urban microclimate in street canyons on the energy demand for space cooling and heating of buildings. *Energy and Buildings* 104–106, 464–473.

Almirall , E., Wareham, J., Ratti, C., Conesa, P., Bria, F., & Gaviria, A. (2016). Smart Cities at the crossroads: New tensions in city transformations. *California Management Review*, 59 (1), 141-152.

Attard, M., & Shiftan, Y. (Eds.). (2015). Sustainable urban transport. Lisbon: Emerald Group Publishing Limited.

Bakici, T., Almirall , E., & Wareham, J. (2013). A Smart City initiative: The case of Barcelona. *Journal of the Knowledge Economy*, 4 (2), 135-148.

Brown, L. J., Dixon, D., & Gillham, O. (2014). *Urban design for an urban century: Shaping more livable, equitable, and resilient cities*. John Wiley & Sons.

Gil-Garcia, R. J., Pardo, T. A., & Nam, T. (Eds.). (2016). *Smarter as the new urban agenda: A comprehensive view of the 21st century city*. Dordrecht: Springer International Publishing.

Kammen, D. M., & Sunter, D. A. (2016). City-integrated renewable energy for urban sustainability. *Science*, 352(6288), 922–28.

Raj, P., & Raman, A. C. (2015). *Intelligent cities: Enabling tools and technology*. Boca Raton, FL: Auerbach Book.

Rutherford, J., & Coutard, O. (2014). Urban energy transitions: Places, processes and politics of socio-technical change. *Urban Studies* 51(7), 1353–77.

Sioshansi, F. P. (2011). *Energy, sustainability, and the environment: Technology, incentives, behavior*. Butterworth-Heinemann.

Tumlin, J. (2012). *Sustainable transportation planning: Tools for creating vibrant, healthy, and resilient communities*. John Wiley & Sons.

6. Grading System

Course evaluation will be based on two assignments (see the table below), seminar participation, and the final exam. The overall **grading structure** of the course will consist of:

- Class participation 25%

- Assignment#1 (case description) 20%
- Assignment#2 (project) 25%
- Final examination 30%

Course assignments:

Assignment	Subject	Mode	Format of presentation
1. Case description	Students should explore and present the case of any sustainable city and set questions to be discussed by the other groups. Ideally, they should stress the strengths and weakness of the management model and make some links to the Russian (potential) experience.	Team work (5 to 7 people in a team) The grade is equal for all of the members of the group, unless someone is suspected in an inappropriate academic behavior.	Oral, 8-10 slides + interactive materials (videos, maps, forum discussions etc.)
2. Project	As a final project, students build and present a creative project to introduce the learned concepts to the different audiences. The formats of presentation could include TED style presentation; argumentation for the St. Petersburg government; presentation for the preschoolers etc. This task is cumulative in its nature, it addresses all the materials that have been learned in the class and online. The detailed steps to complete the project will be distributed in class.	Small Group Project (2 to 3 people). The grade is equal for all of the members of the group, unless someone is suspected in an inappropriate academic behavior.	Oral, written 1000-2000 words

Assessment Criteria

In-class Participation

Grades	Assessment Criteria
«Excellent» (8-10)	Demonstrates original thinking and shows strong evidence of management of urban infrastructures and broad background knowledge. Excellent oral expression.
«Good» (6-7)	Shows strong evidence of management of urban infrastructures, as well as broad background knowledge.
«Satisfactory» (4-5)	Satisfactory overall, showing a fair knowledge of management of urban infrastructures, a reasonable standard of expression. Some hesitation in answering follow-up questions and/or gives incomplete or partly irrelevant answers.
«Fail» (0-2)	Limited evidence of relevant knowledge and an attempt to address the

	topic of management of urban infrastructures. Unable to offer relevant information or opinion in answer to follow-up questions.

Case description (Presentation)

Grades	Assessment Criteria
«Excellent» (8-10)	A well-structured, analytical presentation of the case. Shows strong evidence and broad background knowledge about management of urban infrastructures. Answers to follow-up questions reveal a good range and depth of knowledge beyond that covered in the presentation and show confidence in discussion.
«Good» (6-7)	Clearly organized analysis, showing evidence of a good overall knowledge of the case. The presenter of the project work highlights key points and responds to follow up questions appropriately.
«Satisfactory» (4-5)	Takes a very basic approach to the topic, using broadly appropriate material but lacking focus. The presentation of the case is largely unstructured, and some points are irrelevant to the topic. Knowledge of the topic is limited and there may be evidence of basic misunderstanding.
«Fail» (0-2)	Fails to demonstrate any appropriate knowledge.

Project Work

Grades	Assessment Criteria
«Excellent» (8-10)	A well-structured, analytical presentation of project work. Shows strong evidence and broad background knowledge about management of urban infrastructures. In a group presentation all members contribute equally and each contribution builds on the previous one clearly. Answers to follow-up questions reveal a good range and depth of knowledge beyond that covered in the presentation and show confidence in discussion.
«Good» (6-7)	Clearly organized analysis, showing evidence of a good overall knowledge of the topic. The presenter of the project work highlights key points and responds to follow up questions appropriately. A group presentation demonstrates that the group has met to discuss the topic and is presenting the results of that discussion, in an order previously agreed.
«Satisfactory» (4-5)	Takes a very basic approach to the topic, using broadly appropriate material but lacking focus. The presentation of project work is largely unstructured, and some points are irrelevant to the topic. Knowledge of the topic is limited and there may be evidence of basic misunderstanding. In a group presentation, most of the work is done by one or two students and the individual contributions do not add up.
«Fail» (0-2)	Fails to demonstrate any appropriate knowledge.

7. Examination Type

Final examination consists of 20 short-answer questions. The questions should be answered in approximately 20-30 words each.

The exam will reflect lectures, online course (1/2 of the number of questions, e.g. 10), required reading content, class discussions, and projects presented by the students.

Each correct answer gets 1 point. Partially correct answer gets 0.5 points. The maximum grade for the examination is 10.

Grades	Assessment Criteria
«Excellent» (8-10)	Has a clear argument, which addresses the topic and responds effectively to all aspects of the task. Fully satisfies all the requirements of the task.
«Good» (6-7)	Responds to most aspects of the topic with a clear, explicit argument. Covers the requirements of the task; may produce occasional errors.
«Satisfactory» (4-5)	Generally addresses the task; the format may be inappropriate in places; display little evidence of (depending on the assignment): independent thought and critical judgment include a partial superficial coverage of the key issues, lack critical analysis, may make frequent errors.
«Fail» (0-2)	Fails to demonstrate any appropriate knowledge.

8. Methods of Instruction

Method of Instruction—Blended Learning. The course is build on lecturers, seminars, class discussions, student reports and presentations, reading assignments, projects.