SYLLABUS "SMART CITY TECHNOLOGIES"

Lecturer (name, academic title, e-mail): Evgenii Pakhomov, Associate Professor, e-mail: evpahomov@sfedu.ru

Department responsible for the course or equivalent: Institute of Management in Economic, Ecological and Social Systems

Semester when the course unit is delivered: 3^d

Level of course unit: Master level

ECTS credits: 5

ADMISSION REQUIREMENTS

Applicants are expected to have completed the following courses:

- Information and Communication Technology;
- Introduction to Economic Theory;
- Digital economy.

COURSE OBJECTIVES (AIMS)

- to get deep and systematic knowledge about the concepts of "Smart City", "Urban Informatics", "Urban Computing", "Smart Infrastructure", "Internet of Things";
- to form the ability to identify and analyze the problems of the development of modern cities from the point of view of residents and city leaders; apply criteria for assessing the quality of life of the population; propose solutions to the problems of growth and development of urban infrastructure based on smart city technologies;
- to develop skills in analyzing the effects of implementing smart city projects; estimates of the cost of implementing smart city projects; to rank smart cities.

COURSE CONTENTS

Session 1. Urban Informatics technology background

Sustainable urban development. Actual problems and challenges of urban development. Criteria for assessing the quality of life of the population. Smart city technologies as a tool to solve the problems of growth and development of urban infrastructure.

Session 2. Theoretical foundations of smart cities

Variety of smart city definitions. Definition of smart sustainable cities. Smart city concepts. IT initiatives from the point of view of residents and city leaders, tourists. Technologies of smart city, urban Informatics, urban computing. Key technology trends in Smart City. Models of smart city.

Session 3. Practical issues for Urban Informatics technologies

Analysis of foreign and Russian experience in applying of smart city technologies. The Internet of things in smart cities. Estimating the cost of implementing the basics of smart city. The effects of smart city projects. Rating of smart cities.

LEARNING OUTCOMES

Knowledge:

- theoretical foundations, principles and methods of classification, structuring and analysis of information, the function of software used to solve problems of state and municipal administration;
- analytical technologies, principles and methods for structuring and visualizing data;
- essence and content of tools for work with socio-economic projects (development programs), main trends in the development and modernization (reform) of municipal administration and local self-government.

Skills:

- to search, select, analyse and process information from various sources; apply software in solving problems of state and municipal administration;
- to use information and analytical methods and specialized application software to structure and visualize data for professional tasks;
- to apply modern methods and technologies for the development and implementation of administrative decisions, programs, plans and projects.

Learning Outcomes:

- to be skilled in information classification, structuring and analysis; preparation of documents and reports in solving the tasks of the state and municipal administration;
- to organize the search and processing of necessary information for analytical work using application software that provides data structuring and visualization;

- to be skilled in the application of modern technologies in the organization of the management process of municipalities in accordance with the legislation of the Russian Federation.

Each session lecturing accounts for about 60% of time, students' participation in discussion accounts for 40%. Specifically, the lecturer will invite students to speak during the lecture. At the end of each session, questions are presented for discussion.

During the seminars, students will have an opportunity to analyze some knowledge processes, to work with open source software for knowledge management and recognize how to deal with linguistic values (as knowledge) by using information technologies.

Comprehensive development of student discipline involves:

- students involvement in problem-based presentation;
- students self-guided reading of the further literature;
- project;
- written essay;
- interview and testing.

Criteria for evaluation:

Interview

• up to 20 points is given to the students when correct and comprehensive answers to all proposed questions are given;

• up to 16 points is given to the students demonstrating correct, in general, answers to all proposed questions, however, there are minor comments on the completeness and quality of the presentation;

• up to 14 points is given to the students demonstrating significant comments on the completeness and quality of the presentation of the material or some of the issues remained unresolved;

• less than 12 points is given to the students demonstrating poor answers to questions or incorrect answers.

Essay

• up to 20 points is given to the student if he introduces a clear thesis or a clear statement of the position consistently settled into a well-organized essay; presents a balanced argument supported with information; raises important questions; analyzing and convincing conclusions; there are no conceptual errors;

• up to 16 points is given to the students if he introduces basic requirements for the essay, but permit shortcomings. In particular, there are inaccuracies in the presentation of the material; there is no logical sequence in the judgment;

• up to 14 points is given to the students if the essay's topic is disclosed not enough; specific position are not given; information is inaccurate, mechanical errors seriously impedes understanding;

• less than 12 points is given to the students if the essay topic does not match, reveals a significant lack of understanding of the problem, arguments are scattered, inconsistent, many dubious or erroneous facts, the text is untidy and hard to read, a lot of grammatical and spelling errors.

Testing

Each question in the test is rated up to 2 points. There are 15 questions in the test, and the maximum number of points that a student can receive for the test is 30.

If a student indicates all options correctly or choose the only correct option, then for this question he receives 2 points.

In the case when the student selects a part of correct answers (if there are several options in the question), but doesn't indicate incorrect options, he gets 1 point.

If the student indicates an incorrect answer or the question remained unanswered, then he gets 0 points for it.

Project

• up to 30 points is given to the student if all requirements for the assignment have been met;

• up to 25 points is given to the students if requirements assignment, in general, have been fulfilled, but there are comments on the quality of the developed program for the implementation of digital transformation measures, the presentation of the analysis results, the design;

• up to 21 points is given to the students if the requirements for fulfillment and execution of the task are partially fulfilled; the performance report issued with significant comments;

• less than 18 points is given to the students if requirements for fulfillment and execution of the task have not been fulfilled; there is no report shown.

COURSE LITERATURE (RECOMMENDED OR REQUIRED)

1. Innovations in state and municipal administration: textbook / I.V. Novikova - Stavropol: NCFU, 2016. – 284 p. - URL: http://biblioclub.ru/index.php?page=book&id=459054.
2. Kiseleva A.M. State and municipal services: textbook / A.M. Kiseleva. - Omsk: Omsk State University, 2018. - 224 p. - URL: http://biblioclub.ru/index.php?page=book&id=562963.
3. Digital future of public administration based on the results: conference materials / E.I. Dobrolyubova, V.N. Yuzhakov, A.A. Efremov, E.N. Klochkova, E.V. Talapina, Ya.Yu. Startsev. - Moscow: Publishing House "Delo", 2019. - 115 p. - URL: http://biblioclub.ru/index.php?page=book&id=563449.
4. Competition in the Digital Age: Strategic Challenges for the Russian Federation: Report on the Development of the Digital Economy in Russia. World Bank. 2018. – URL: documents.worldbank.org/curated/en/848071539115489168/pdf/Competing-in-the-Digital-Age-Policy-Implications-for-the-Russian-Federation-Russia-Digital-Economy-Report.pdf.