

Warsaw University of Technology | Doctoral School No. 5

**Course offered in the Doctoral School No. 5
– Spring semester of the 2021/2022 academic year**

TITLE
Planning and forecasting the use of land resources
CONDUCTING UNIT
Doctoral School No. 5
SCIENTIFIC DISCIPLINE
Civil engineering and transport
IMPLEMENTING UNIT
106000 - Faculty of Geodesy and Cartography
SUMMARY DESCRIPTION
<p>The course consists of 5 main thematic areas:</p> <ol style="list-style-type: none"> 1. The process of urban sprawl. The growing problems of urban agglomerations. Basic terms (e.g. urban sprawl, soil sealing), methods of measuring urban sprawl, and case studies. 2. Urban trends opposing urban sprawl: principles of compact city, new urbanism, smart growth, smart city. 3. Reclamation and revitalisation of degraded areas – methodological approach Brownfields, scale of degradation, possibilities of reclamation and revitalization of degraded areas. The concept of guidelines for revitalization. New approach - the use of multicriterial analysis and spatial data mining tools. 4. Possibilities of using geographical information systems and geoinformation tools in the field of land use research. Characteristics of existing geoinformation tools. 5. Revitalisation of brownfields – case studies (Europe, USA). The course can be extended with practical training - design exercises with the use of GIS tools.

FULL DESCRIPTION

Course participants will gain knowledge of important concepts and problems related to contemporary urban planning. Particular emphasis will be placed on issues related to counteracting negative urban development processes, such as urban sprawl and soil sealing. The most modern countermeasures, with the use of GIS tools, will be presented. Students will obtain knowledge in the field of revitalization and reclamation of various types of areas (post-industrial, post-railway, post-military, degraded urban areas), as well as in the field of village renewal. The course consists of 5 main thematic areas:

1. The process of urban sprawl. The growing problems of urban agglomerations. The main issues discussed during the course relate to the basic terms (e.g. urban sprawl, soil sealing, spatial order), advantages and disadvantages of urban sprawl, ways to limit the process of soil sealing. Multi-disciplinary methods of measuring urban sprawl will be presented. Problems connected to the residential building development in the context of creating spatial order in suburban areas will be discussed.
2. Urban trends opposing urban sprawl: principles of compact city, principles of new urbanism, smart growth, smart city – issues presented on specific examples.
3. Reclamation and revitalization of degraded areas – methodological approach. Due to deindustrialisation and the expansion of urbanisation and the process of urban sprawl, in cities emerged the areas that undergo gradual degradation. Most important data and information related to the brownfields, scale of degradation of areas in Europe, possibilities of reclamation and revitalization of degraded areas and contaminated sites will be shown. The concept of guidelines for revitalization will be presented, with particular consideration of new approach - the use of multicriterial analysis and spatial data mining tools. Theoretical foundations of data mining methods and its usefulness in the context of urban planning will be discussed.
4. Possibilities of using geographical information systems and geoinformation tools in the field of land use research.

The process of development of cities has multidirectional character, and depends on many factors. The number of variables affecting it is practically unlimited. Therefore, appropriate research methods are required. To answer these needs, during the course characteristics of existing geoinformation tools and examples of spatial analysis will be presented, as well as modern solutions facilitating the effective revitalization process.

5. Revitalization of brownfields – presentation of case studies (Europe, USA) with particular consideration of success or failure factors of analyzed projects.

Revitalization of cities, understood as interdisciplinary actions (in spatial, social, economic, cultural sphere) undertaken by multiple subjects (as local authorities, investors, designers, associations, cultural institutes) is considered the most important task of contemporary urban planning. Its growing importance has coincided with promulgation of sustainable development principles, which focus on rational use of resources. The most important issues related to the above topics will be presented in detail, with particular emphasis on the commonly used methodology.

The lecture will end with a test including open- and multiple-choice questions. Conditions for passing the course: a joint mark with tests and a short essay on a given topic (given in the middle of the semester).

LITERATURE

Bott H., Grassl G., Anders A., Sustainable Urban Planning - Vibrant Neighbourhoods - Smart Cities - Resilience, 2019.

Gehl J., Life Between Buildings: Using Public Space, 2011, Island Press.

Forman, T.T. Richard, Towns, Ecology, and the Land, 2019, Harvard University, Massachusetts, Cambridge University Press

Dantzig, G. B. and Saaty, T. L., Compact City: Plan for a Liveable Urban Environment, 1973, W. H. Freeman, San Francisco.

Brundson Ch., Singleton A., Geocomputation: A Practical Primer., 2015, London: Sage Publication Ltd.

Olszewski R., Turek A., Using fuzzy geoparticipation methods to optimize the spatial development process in a smart city, 2018, Proceedings: 4th IEEE International Conference on Collaboration and Internet Computing. CIC 2018 , 2018, USA, Institute of Electrical and Electronics Engineers, s.430-437, ISBN 978-1-5386-9502-9. DOI:10.1109/CIC.2018.00065

Olszewski R., Gnat M., Trojanowska H., Turek, A., Towards Social Fuzzy Geoparticipation Stimulated by Gamification and Augmented Reality in Proceedings of 13th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD), 2017, s.1-9. DOI:10.1109/FSKD.2017.8392965

LEARNING OUTCOMES

KNOWLEDGE:

1. knowledge of the interdisciplinarity and complexity of the revitalization process
2. knowledge about the basic possibilities of using spatial data mining methods for the purposes of revitalization
3. methodical approach to solving research problems faced by contemporary urbanized areas
4. standards and principles of conducting public consultations on the proposed initiatives and informing about the results

SKILLS:

1. learning about GIS tools enabling advanced spatial analysis for planning purposes
2. using English on B2+ level enabling participation in international conferences and research debate

COMPETENCES:

1. the ability to collect data on the specificity of development conditions and causes of degradation of a selected area

2. the ability to form one's own critical opinion on the changes taking place in contemporary cities
3. the ability to predict the multidirectional effects of one's planning activities in the short and long term perspective

ASSESSMENT METHODS AND CRITERIA; COURSE COMPLETION FORM

The course consists of 5 main thematic areas. Additionally, on the Moodle or MS Teams platform, for selected lectures, e-lessons will be available for self-acquisition, consolidation, and expanding knowledge, using the materials provided and other available resources (i.e. websites, scientific articles, book chapters).

The basis for passing the lecture content is:

- taking 2 short tests during the classes;
- a short, 1 page - essay on a given topic (given in the middle of the semester).

The tests will consist of questions of different types, e.g. one answer from many possible, many answers from many possible or open-ended questions. To pass the test, it is required to obtain a minimum of 51% of points. Any notifications regarding the test can be made to the course coordinator up to two days before the test date.

Rules for determining the total score from lectures:

A joint mark with tests and a short essay on a given topic.

The grades are entered according to the principle:

5,0 – five (4,76 – 5,0); 4,5 – four and a half, (4,26-4,75), 4,0 – four (3,76-4,25), 3,5-three and a half, (3,26-3,75), 3,0- three (3,0-3,25).

LANGUAGE OF THE COURSE		ECTS CREDITS
English		3
TYPE OF CLASSES	NUMBER OF HOURS	COURSE INSTRUCTOR
Lecture	30	Robert Olszewski, dr hab. inż., prof. uczelni; Agnieszka Wendland, dr inż.

ADDITIONAL INFORMATION

The course is realized within the SEED Project – NAWA STER Programme. Therefore, in order to take part in it, each participant is obliged to deliver to the PhD Students' Office the Declaration of the Project Participant concerning personal data. The document must be submitted until **March 1, 2022**.

The document can be found here:

https://www.sd.pw.edu.pl/sd_en/SEED-NAWA-STER