Smart Cities and Urban Informatics (SCUI) 2021/2022

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Course of Study

The M.A. program consists of 32/34 credits over two consecutive semesters :16 credits are required courses, 6 credits are methods, 10 credits thematic courses. Four credits are from a seminar paper to be written in one of the indicated courses. Students will be required to conclude all courses for credit with a grade based on either an exam or written paper.

MODERN HEBREW:
The study of Modern Hebrew is an optional component of the program. Students may enroll in Modern Hebrew during the autumn and spring semesters. The study of Modern Hebrew is strongly encouraged as knowledge of Hebrew is an important portal into Israeli society, media, and culture, and permits students to work with published material in Hebrew. Modern Hebrew credits do not count towards the credits of the degree.

List of Course
REQUIRED COURSES (15 credits)

01502   GIS and Urban Informatics
Mr Guy Keren
Geographical Information Systems (GIS) are at the core of all smart cities - that's what makes them smart.
From collecting data through analyzing to presenting (smart) cities data, GIS is a principal component of all smart operations.
In this introductory course, we will gain practical experience working with GIS software and elementary theoretical background of geoinformatics - the necessary tools for a wide variety of tasks.

Autumn Semester	M	13:00-15:00	Social Sciences Bldg.	Lecture	3 credits
	M	15:00-15:45		Exercise	

01505   Urban Remote Sensing
Prof. Noam Levin
Autumn semester W   14:30-16:00   Social Sciences Bldg. Seminar & Exercise 2 credits
The aims of this course are to familiarize the students with the world of remote sensing, and the capabilities it offers to map urban areas at various spatial and temporal scales, using satellite images. Specific topics we will cover will include mapping of impervious areas, vegetation and functional areas within cities. The students will learn some of the basics of remote sensing, will become familiar with various datasets which are freely available, and at the end of the course will be able to conduct basic remote sensing analysis of urban areas.

01507 Urban Planning: From Modernism to Urbanism and Smart Growth

Prof. Eran Razin

Urban planning is a major component of urban dynamics and a field for the application of smart city tools. The course aims to introduce changing conceptions of urban planning and technological, economic and political transformations that explain them. It discusses changing conceptions, from visionaries such as Ebenezer Howard, Frank Lloyd Wright and Le Corbusier, to present day strategies of "neoliberal" planning, smart/sustainable growth and (new) urbanism, concluding with likely future trends in light of technological breakthroughs, global warming challenges and post- COVID-19 realities.

Autumn Semester   W   10:30-12:00   Social Sciences Bldg. Lecture & Exercise
                                                                  2 credits

40996 Smart Cities: Reality in the Making
Dr Rotem Bar-Or

Most people live in urban areas today. With a strong immigration trend to cities and the growing population, more than 65% of humanity is expected to live in cities by 2050, setting a new set of disturbing challenges. The information revolution, accompanied by the developed technologies of recent decades, introduces a new concept: the smart city. This course will define that term and discuss further aspects and implications of the future cities on human social, economic, and environmental systems.

The course will combine theoretical lectures, including guest experts from the industry and the academy and a field trip to the very heart of the development of the smart city technologies. Located in the intersection between the hi-tech, academy, and ancient history – Jerusalem is an optimal laboratory for the exploration of smart cities.

Autumn Semester   W   16:30-18:00   Social Sciences Bldg. Seminar   2 credits

01509 Spatial Justice and Smart Cities
Dr Emily Silverman

This seminar course aims to give students tools to investigate spatial justice practices and policies in cities, with a focus on housing, transport and public spaces. Student teams investigate good practice case studies from cities around the world, and explore the potential for adaptation of these practices in Jerusalem or elsewhere. Course methods are based on readings, peer learning, class discussion and team projects.

Autumn Semester   M   17:00-18:30   Social Sciences Bldg. Seminar 2 credits

01516 Field Course: Transitioning to Smart City Growth: Jerusalem: between Tradition and Innovation
Dr Ronit Purian

The landscape of cities, smart cities and societies invites us to reflect, understand and plan possible collective futures. Through a series of field trips and meetings, this unique course will put the pieces together: assemble the domains and silos of municipalities and systems; figure out the role of new technologies and service applications; and develop a vision of innovation in cities.

To carry out a meaningful project, students are invited to apply methods and tools learned in other courses in the program, to practice new skills and gain real-world experience

Year   M   19:00-20:30   Social Sciences Bldg.   Lecture   4 credits

METHODS AND TOOLS (6 credits)

01508 Python Programing
Dr Roni Drori

This is a practical hands-on course for students with no previous programming background. We will focus on practice and the lecture will be accompanied by exercise and a weekly homework will begiven.

Autumn Semester   M   10:30-12:00   Social Sciences Bldg. Lecture 2 credits

01517 Urban Digital Data and Analytics
Dr Roni Drori

This course will present different ways to collect and exploit urban data. We will gather data using various sources, organize and analyze them.
Spring Semester   M   13:00-14:30   Social Sciences Bldg. Lecture 2 credits
Prerequisite for course 01517: Completion of course 01508 and or prior knowledge of Python Programing

01521   Urban Simulation
Dr Yair Grinberger

Cities are complex dynamic systems in which individuals, households, infrastructure, and governmental institutions constantly interact. This complexity makes it hard and at times impossible to assess the outcomes of changes within the system. In such cases, simulations based on computational urban models can be used to gain insights and intuition regarding the dynamics of urban systems under various conditions. In the course "Urban Simulation", the students will gain both the theoretical knowledge required for understanding how urban simulations are developed and used and the practical know-how required for developing such simulations using Python language programming.
Spring Semester   W   10:30-12:00   Social Sciences Bldg. Seminar 2 credits

THEMATIC COURSES (11 credits)

40997 The Technological Infrastructure of the City
Dr Rotem Bar-Or

The rapidly growing usage and coverage of information & communication technologies (ICT), and high-performance computing (HPC), introduces new invisible urban infrastructure that becomes the backbone of the future smart cities. This course will explore those urban technological infrastructures, including their fundamental basics, variations, current implementation and vulnerabilities, and future predicted trends. The course includes lectures and field trips.
Spring Semester   W   16:30-19:00   Social Sciences Bldg. Seminar 3 credits

01533 Smart Cities and Sustainable Mobility Ecosystems
Dr Maya Ben Dror

The application of information revolution in mobility, from autonomous to on-demand travel and delivery, disrupts urban mobility, erodes governing policies, and generates rich data. This course examines the utilization of and attitudes towards new mobility and its incorporation in urban transportation policy - increasing urban sustainability and resilience. Students of this elective will learn how skills, methods and tools gained through core courses can be applied in urban policy environments, partially through real world experiences of guest speakers from leading companies, public and non-profit organizations
Spring Semester   M   10:30-12:00   Social Sciences Bldg. Lecture 2 credits

01536 Project: Technologies for Managing the Smart City
TBA

In this project-based course students will have the opportunity to apply a suite of tools and methods acquired in other courses, to problems dealing with the management and functioning of the city. These can deal with the delivery of municipal services, the management of city infrastructure, the efficient use of city resources and the monitoring of intra-urban mobility.
Spring Semester   W   14:30-16:00   Social Sciences Bldg. Lecture 2 credits

01544 Field Course: Urban Energy and Smart City Growth
Mr Elad Shaviv
The course will look at the global mega-trends affecting urban energy and smart city growth. The objectives of the course are to understand the urban energy market and the way smart energy solutions can sustain the growing demand for energy in cities and their role with the migration to smart city operational model. To this end, students will be exposed to both the concepts and terminology of the energy market as well as the practice of supplying innovative solutions to different energy challenges in cities. The course will comprise a mixture and of both in-class meeting s and in-field site visits
Autumn Semester M   15:00-16:30   Social Sciences Bldg. Seminar 2 credits

01524 Smart Transportation Systems
Dr Jay Kaplan
The Smart Transportation Systems course will introduce students to the main elements of smart transportation systems, focusing on planning principles, technological and systems approaches, and institutional aspects. The course will provide students with the knowledge and tools for evaluating and discussing the impact of various technologies, applications and services. Students will be presented with the evolving state of the art and with a survey of success stories in world cities. We will have the opportunity to explore tools for the use of big data and modeling in improving planning decisions. We will discuss the challenges and opportunities that smart transportation systems present for the future of urban planning.
Spring Semester M   17:00-18:30   Social Sciences Bldg. Lecture 2 credits

Program is subject to change