

**SYLLABUSES FOR THE DEGREE OF
MASTER OF SCIENCE IN URBAN ANALYTICS
(MSc(UrbanAnalytics))**

(“The syllabuses are applicable to candidates admitted to the Master of Science in Urban Analytics Curriculum in the 2020-21 academic year and thereafter”)

(SEE ALSO GENERAL REGULATIONS AND REGULATIONS FOR TAUGHT POSTGRADUATE CURRICULA)

1. CURRICULUM STRUCTURE

The curriculum shall include assessment of the prescribed courses subject to the approval of the Head of the Department of Urban Planning and Design and a Dissertation/Capstone Project. Candidates are required to complete a total of 69 credits of courses.

The curriculum shall normally extend over two academic years of part-time study. Candidates shall not be permitted to extend their studies beyond the maximum period of registration of four academic years of part-time study, unless otherwise permitted or required by the Board of the Faculty.

Candidates are required to follow courses of instruction and satisfy the examiners in each of the following seven Urban Analytics Courses:

- Foundations in Spatial Data Analysis
- Geographic Information System (GIS) for Urban and Regional Planning and Development
- Urban Big Data Analytics
- Programming and AI for Future Cities
- Spatial Mobilities Analytics
- Public Space Design Analytics
- Science of Cities

and a total of 12 credits of Urban Theory Courses as selected from a list approved by the Department from time to time. Candidates’ selection of courses shall be approved by the Head of the Department. In addition, candidates are required to complete satisfactorily a Dissertation/Capstone Project on a date to be specified by the Head of the Department.

2. ASSESSMENT

Each of the courses followed by candidates is examined either by an assessment of coursework, or by a combination of coursework assessment and a written examination. To complete the curriculum, candidates shall satisfy all the assessments and the relevant requirements prescribed in the Regulations for the Degree of Master of Science in Urban Analytics.

3. COURSE LIST

Urban Analytics Courses

URBA6001. Foundations in Spatial Data Analysis (6 credits)

Spatial data has become indispensable for building a smart city, particularly in city planning, design and management. This involves new means of capturing spatial data by different types of sensors, advanced application of Artificial Intelligence (AI) and rapid development of spatial analytics in the area of Geographic Information System (GIS) and Building Information Modelling (BIM). The main objective of this course is to equip students from relevant disciplines (e.g. land use planning, surveying, architecture, landscape architecture, engineering, environmental science and social sciences) with foundational knowledge and techniques on spatial data analysis.

Assessment: 50% continuous coursework assessment; 50% examination

URBP6017. Geographic information system (GIS) for urban and regional planning development (6 credits)

This course introduces the basic concepts and methods in the use of geographic information system as a spatial planning support system in different areas of urban and regional planning and development. It examines the basic principles and functions of geographic information system in data input, manipulation, retrieval, visualization and modelling of geographical data for supporting spatial planning decisions.

Assessment: 100% continuous coursework assessment

URBA6002. Urban Big Data Analytics (6 credits)

This course further develops students' knowledge and skills in handling, analysing and modelling urban data, especially big data. Students will learn conceptual frameworks for analysing and modelling urban issues, methodologies and software tools for processing and modelling urban data; as well as applying urban models and analytics to empirical cases. The aim of this course is to equip students with advanced urban modelling and analytics to explain current urban conditions and predict future urban changes beyond the smart era.

Assessment: 70% continuous coursework assessment; 30% examination

Prerequisite: URBP 6017 Geographic Information System for Urban and Regional Planning and Development

URBA6003. Programing and AI for Future Cities (6 credits)

This course provides an introduction to programming, computational thinking, and artificial intelligence (AI), which have become essential skills in the fields of smart cities and urban science. Students are expected to reflect how software, data, smart technologies, and AI are becoming integral to future smart cities; learn key concepts, algorithms, and data structures; acquire skills and experiences in computer programming; and understand how programming can be applied to solve urban problems.

Assessment: 100% continuous coursework assessment
Prerequisite: URBA6001 Foundations in Spatial Data Analysis

URBA6004. Spatial Mobilities Analytics (6 credits)

This course discusses how space, society (institutions) and accessibility are related and how accessibility should be defined, analysed and designed/improved in light of the existing, possible or proposed spatial arrangements of socially valued goods, services and opportunities, which are embedded in, and shaped by social norms, values and institutions. It argues that complex relationships exist between space, society and accessibility, which should be accounted for in related policy/planning interventions. Students will learn to understand, analyze, manage and harmonise such relationships to deliver desirable outcomes such as efficiency, equity, quality of life and sustainability.

Assessment: 60% continuous coursework assessment; 40% examination
Prerequisite: URBP 6017 Geographic Information System for Urban and Regional Planning and Development

URBA6005. Public Space Design Analytics (6 credits)

The key concerns of this course are public and common space in relationship to activity space that span over street, estate, neighborhood, district, and beyond by age and socio-economic group: how to enhance future public space. This course discusses four questions in relationship to public space exploring the role of theories, urban science, smart technologies, and urban analytics. Researching the future of public space is integral to the course: how to engage with the demand/supply constrains through innovative design solutions including walkability, “street” design, public and private quasi-public, open and green space both in Hong Kong and internationally.

Assessment: 60% continuous coursework assessment; 40% examination
Prerequisite: URBP 6017 Geographic Information System for Urban and Regional Planning and Development

URBA6006. Science of Cities (6 credits)

This course introduces fundamental theories and models for an emerging field of urban sciences, with emphasis on the urban economics, regional science, and spatial planning literature. The primary goal of this course is to strengthen students’ theoretic and scientific bases for cities and regions as a prerequisite for the mastery of advanced data analytics or urban modelling techniques. A thorough understanding of the city and the system of cities is essential in developing expertise in urban science, and taking advantage of advanced data analytics and modeling tools would not be possible without the former.

Assessment: 100% continuous coursework assessment

Urban Theory Courses

Students shall take a total of 12 credits of Urban Theory Courses. The selection of courses shall be approved by the Head of the Department. Not all courses are available each year. This list may vary from year to year. The courses may include the following:

URBP6002. Urban Development Theories (6 credits)

This course reviews the theoretical frameworks for the understanding of urban development processes. It analyses the economic, spatial and socio-political dimensions of urban activities. The dynamics of urbanization in the global production system, the relations between capital accumulation and urban development, place marketing and the rise of the creative cities will be discussed.

Assessment: 100% continuous coursework assessment

URBP6003. Planning Practice, Law and Ethics in Hong Kong (6 credits)

This course reviews the theoretical frameworks for the understanding of urban development processes. It analyses the economic, spatial and socio-political dimensions of urban activities. The dynamics of urbanization in the global production system, the relations between capital accumulation and urban development, place marketing and the rise of the creative cities will be discussed.

Assessment: 100% continuous coursework assessment

URBP8002. International Planning Policy and Practice (6 credits)

This course examines different planning systems across the world. Understanding the key approaches to urban planning in different countries and regions is important in developing an appreciation of how different techniques, policies, and practices emerged and developed to help shape the urban landscapes of various localities within their own contexts. The course takes a comparative approach to understand and evaluate planning policy and practice and the planning outcomes across a spectrum of international case studies, and attempts to explain their differences and similarities by probing into the dynamics between government intervention and market freedom, diversity in development certainty vis-à-vis land use controls and planning governance modes.

Assessment: 100% continuous coursework assessment

MHMP8008. Transitional Cities: Urban and Housing Development (6 credits)

Building upon comparative concepts and introductory materials of local knowledge, this course aims to provide students with the opportunity to explore contemporary urban changes both in the countries that are undergoing the transition from the planned to a market-oriented economy and in newly industrialised economies. The course has a regional focus on cities in Pacific Asia, in particular Chinese cities, and cities in Central and Eastern Europe. By the end of the course, students should be able to gain an empirical understanding of diverse local contexts and to broaden the concepts discussed in urban and housing studies.

Assessment: 100% continuous coursework assessment

MUDP2020. Values of Urban Design: Urban, Social, Environmental Economics (6 credits)

Urban design and real estate engage the complex mechanisms of environmental and social capital in relation to finance and economics, by seeing design and built environment investment as intrinsically associated with economics and values. The course is an introduction to the issues arising of these associations: what roles urban economics play in urban design? From regional and spatial economics to spatial initiatives and governance to approaches to values in urban design. Conversely how urban

design visioning can have impacts on economics, financial investment and values, including added environmental, social, cultural and aesthetic values?

Assessment: 100% continuous coursework assessment

MUDP1030. Morphologies & Urban Design Theories (6 credits)

This course provides an introduction to the three natures of urban morphology: natural, built environment, institutional configurations and urban design theories. Introduction to urban morphologies will examine key concepts, the study of the formation of urban fabric, the relationship of these components through time and at different spatial scales in local and international contexts. Urban design theories describe the state of the art of research about the relationship between urban morphology and human effects and other impacts referenced to the key historical urban design thinkers.

Assessment: 100% continuous coursework assessment

Dissertation/Capstone Project

Students can choose between a dissertation and a capstone project. The capstone project is delivered through a smart planning and design studio.

URBA6401. Dissertation (15 credits)

The dissertation aims to provide students with opportunities to integrate the acquired knowledge, skills, and techniques to support and enhance urban policy, or to investigate the urban and societal implications and impacts of changed planning and design practices under the advancement of smart technologies. Each student is assigned a dissertation supervisor from among the teachers contributing to the programme. Briefings on research proposal, research design, and methodology/methods will be provided to facilitate dissertation preparation. Individual students are required to defend their research proposals and regularly report their progress to their assigned supervisors. The dissertation should be between 15,000 to 20,000 words in length.

Assessment: 100% continuous coursework assessment

Prerequisite: URBP 6017 Geographic Information System for Urban and Regional Planning and Development

URBA6402. Smart Planning and Design Studio (15 credits)

This studio comprising a community and a strategic component respectively and relatedly is designed to enhance students' abilities to apply smart city science theories and technologies such as Artificial Intelligence (AI), BIM, and GIS in the strategic and community planning processes. Special emphasis is put on working with the local community throughout the processes to reach sustainable, balanced and integrated planning/design outcomes. A topic of a local scale and another on related territorial scale will be chosen for students to develop community and strategic planning/design intervention. Students will work in groups, simulating a consultancy task force situation and applying advanced technologies in the processes of data collection, development option and/or policy formulation, evaluation and recommendation.

Assessment: 100% continuous coursework assessment

Prerequisite: URBP 6017 Geographic Information System for Urban and Regional Planning and

Development
