

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

(See Also General Regulations and Regulations for Taught Postgraduate Curricula)

These syllabuses are applicable to candidates who are admitted to the Master of Science in Urban Analytics curriculum in the 2026-2027 academic year and thereafter

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.

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

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

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

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: 100% continuous coursework assessment

Prerequisite: URBA6011. Programming and Foundations in Urban 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: 100% continuous coursework assessment

Prerequisite: URBA6011. Programming and Foundations in Urban Data Analysis

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

URBA6007. 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

URBA6008. Spatial Planning Analytics (6 credits)

Spatial planning shapes the built environment and human activities across sites, neighbourhoods, cities and regions. This course introduces the basic concepts and methods in the use of spatial analytics and modelling to support sustainable urban development across different spatial scales. It is applied oriented and designed to equip students with analytical and modelling techniques for measuring, modelling and predicting urban spatial changes. It covers a wide range of topics, including urban form metrics, geodesign, location choice models, frameworks for land use and transport interaction, and scenario planning. Students will be required to reflect on and design context-specific strategies for a sustainable urban future, based on spatial planning analytics and modelling.

Assessment: 100% continuous coursework assessment

URBA6009. Artificial Intelligence for Future Cities (6 credits)

This course provides an introduction to programing, 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 programing; and understand how programing can be applied to solve urban problems.

Assessment: 100% continuous coursework assessment

Prerequisite: URBA6002 Urban Big Data Analytics

URBA6011. Programming and Foundations in Urban 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 programming techniques on spatial data analysis.

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:

Not all elective courses are available each year and list of courses may vary from year to year. Selection of elective courses offered by other taught postgraduate curricula, whether from the Faculty of Architecture, or the other Faculties at the University of Hong Kong, is subject to prior approval by the Head of Department in consultation with the respective Programme Directors. Please check the courses offered by these curricula at the time of enrolment and refer to the respective syllabuses for the course descriptions.

URBA6010. Special Study in Urban Analytics (6 credits)

Detailed study or studies on a topic or topics related to urban analytics approved by the Head of the Department

Assessment: 100% continuous coursework assessment

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 provides a detailed understanding of professional planning practices in Hong Kong. It deals with the practical dimensions of planning in both the public and private sectors. The course reviews the history, policies, strategies, administrative and legal procedures of planning. It also examines issues surrounding the ethical basis of professional planning activity.

Assessment: 60%-70% continuous coursework assessment and 30%-40% examination

URBP6123. Public Transport Systems (6 credits)

This course is designed to examine the nature and the role of public transport systems mainly in the urban context with special reference to high-density development. Topics include the nature and the characteristics of passenger transport, the operation and management of public transit systems, deregulation and privatisation, the role of para-transit, and multi-modal cooperation and competition.

Assessment: 100% continuous coursework assessment

URBP6131. Transport Policy and Planning (6 credits)

This course focuses on key issues in transport policy and the implementation of transport plans and programmes. It examines the role of private and public modes within the overall urban transport system as well as pedestrian movement planning, airport development and seaport development. The course uses examples drawn from various countries to evaluate the appropriateness and effectiveness of alternative policies and implementation mechanisms.

Assessment: 100% continuous coursework assessment

URBP6157. Transport Economics (6 credits)

This course helps to develop a specialist appreciation of the economics of urban transport provision. It highlights the economic principles and techniques employed in planning, operating and managing our city transport systems and concentrates on topics such as: travel time valuation, road congestion costing

and pricing, public transport finance and cost-recovery, and economic appraisal techniques employed therein.

Assessment: 40%-60% continuous coursework assessment and 40%-60% examination

URBP6904. Housing, Planning and Sustainability (6 credits)

This course aims to provide an integrative and in-depth understanding of Hong Kong's housing system and its relationships with urban planning and the concepts of sustainable development. It discusses the theoretical and practical aspects of housing, making special reference to their relationships with urban planning and sustainable development. Major topics include the housing system concepts, the political economy of housing policies, land use planning and housing affordability, principals of residential planning, housing policy analyses, housing market analyses, and the application of the sustainable development perspective to housing analyses.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

URBP6905. Globalization and Urban Regional Development in China (6 credits)

This course examines the processes of globalization and studies its implications for urban and regional development in China. It studies the general concepts of urban development and the historical legacy constraining urban development in China. With China's accession to WTO membership, special emphasis is placed on the interactions between the transnational corporation (TNCs) and the different level of the state and local governments. Regional dynamics will be examined in the context of global competitiveness.

Assessment: 100% continuous coursework assessment

URBP7005. Planning Future Cities and Regions (6 credits)

In this course, class participants explore prevalent and emerging challenges cities and regions confront in pursuing sustainable development and discuss potential planning and policy solutions to such challenges. In detail, the course covers three main topics: key concepts/theories of sustainable development and global megatrends, such as slow growth, ageing, inequality, and climate change; available planning and policy tools for sustainable development—and in response to the megatrends—and related performance/impact assessment systems; and contemporary practice in both local and international contexts.

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

MHMP6858. Housing Economics (6 credits)

This course provides a basic introduction to economics and the application of economic concepts in the analysis of housing issues. The course also deals with the principles of cost-benefit analysis and economic evaluation in general in the housing context. Other topics covered include land policy and economics, cycles in housing activity, the financing of housing development and privatisation. The course also introduces the functions, principles and methods of valuation.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

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: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

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

MUDT5010. Transport Network Analysis and Modelling (6 credits)

This course introduces a variety of advanced analytical methods for analyzing and modelling urban transportation systems, stressing a qualitative understanding and the applications of these methods in urban transport design. The primary methods introduced will include complex networks, machine learning, and simulation-based methods. Throughout the course, we will focus on the applications of these methods to the design of transport systems, with an eye towards how these designs can facilitate urban vitality, sustainability, accessibility, and various factors of well-being (for example resilience, disease spread, social integration, and equity).

Assessment: 100% continuous coursework assessment

MHCD7001. Design, Survey and Modelling for Urban Health (6 credits)

This is a methodology course aimed at assessing key attributes of urban environments for population health improvement. The course will introduce concepts of: 1) study design (descriptive and analytical [observational study and experimental study]); 2) study populations (sample size calculation, data collection/sampling approaches); 3) exposure assessment (survey and management of urban environments: air pollution, water, wastes etc.); 4) outcome assessment (physical and mental health, economics, policy etc.); 5) describe and analyse evidence (disease mapping, spatial analysis models, and health effects assessment of environmental exposures). Students will be also encouraged to form groups to appraise and interpret existing evidence of the links between urban exposures, behaviour and health outcomes.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

MHCD7002. Principles of Healthy Cities (6 credits)

This is a theoretical course focusing on fundamental concepts, theories and models on a wide range of emerging urban health issues at local, regional and global scales. The aim is to employ systems thinking to elucidate the intrinsic multifactorial interactions between urban space and human behaviour and lifestyle resulting in the socio-spatial production of health. Urban planning, design and policy aspects at building-, neighbourhood- and city-levels promoting active-living, salutogenicity, social cohesion and racial inclusivity, age-friendliness, climate change-resilience, pandemic-resilience and longevity-readiness, and their role in population health and wellbeing will be discussed.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

MHCD7003. Health Impact Assessment of Urban Development Projects (6 credits)

Urbanisation is one of the leading global trends of the 21st century. It has been found that urban development is closely associated with significant human health in both direct and indirect way. This course will introduce Health Impact Assessment as a tool to internalize evidence in our decision-making process with focus on health externalities. The process of full-chain health impact assessment including exposure assessment, health risk assessment and economic evaluation of various aspects of urban design and urban and transport development projects will be elucidated.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

MHMP8012. Key Issues in Ageing Communities (6 credits)

This course examines key trends in ageing cities and introduces key ageing-related concepts, such as healthy ageing and age-friendly communities. It discusses the influence of the built environment and social environment on the physical and mental health of older adults, including the role of housing, transport and opportunities for social interactions. The course also draws attention to social inequalities in later life. Other topics include ageism, smart technologies and the digital divide.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

MHMP8013. Smart and Sustainable Cities (6 credits)

This course examines the rise of smart and sustainable cities, as mobilized by a range of governance actors from the urban to global scale, including their origins, construction and management. It explores the underlying motivation for these specific urban models - often grounded in the UN Sustainable Development Goals (SDGs) - their potential, but also their more problematic aspects. The course will introduce key theories that have been used to understand smart and sustainable cities, and relevant planning and governance issues. Learning activities will involve case studies, debates, and field research intended to enhance student engagement.

Assessment: 30% - 100% continuous coursework assessment and/or 0% - 70% examination

Selection of elective courses offered by other taught postgraduate curricula of the Faculty of Architecture is subject to prior approval by the Head of Department in consultation with the respective Programme Directors. Please check the courses offered by these curricula at the time of enrolment and refer to the respective syllabuses for the course descriptions.

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: URBA6007 Geographic Information System (GIS) for Urban and Regional Planning Development and URBA6011. Programming and Foundations in Urban Data Analysis

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 a 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: URBA6007 Geographic Information System (GIS) for Urban and Regional Planning Development and URBA6011. Programming and Foundations in Urban Data Analysis

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