

## SYLLABUSES FOR THE DEGREE OF MASTER OF SCIENCE IN URBAN DESIGN AND TRANSPORT (MSc(UDT))

*(See also General Regulations and Regulations for Taught Postgraduate curricula)*

*These syllabuses are applicable to candidates admitted to the Master of Science in Urban Design and Transport in the academic year 2022-23 and thereafter.*

The Department of Urban Planning and Design offers a postgraduate course leading to the degree of Master of Science in Urban Design and Transport.

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### CURRICULUM STRUCTURE

The curriculum shall include assessment of the prescribed and elective courses subject to the approval of the Head of the Department of Urban Planning and Design, the Urban Design Studios and the Research Dissertation and Urban Design & Transport Thesis Project. Candidates studying the full-time curriculum are required to complete a total of 120 credits of courses.

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

#### Core courses (Compulsory)

|                                                              |           |
|--------------------------------------------------------------|-----------|
| MUDP1030 Morphologies and Urban Design Theories              | 6 credits |
| URBA6011. Programming and Foundations in Urban Data Analysis | 6 credits |
| URBP7005 Planning Future Cities and Regions                  | 6 credits |
| URBA6004 Spatial Mobilities Analytics                        | 6 credits |
| MUDT3010 Public Space Design Analytics                       | 6 credits |
| MUDP2010 Research Methods and Techniques                     | 6 credits |
| GEOG7001 Survey and Data Analysis in Transport Studies       | 6 credits |
| CIVL6007 Behavioral Travel Demand Modelling                  | 6 credits |

#### Studio Courses (Compulsory)

Candidates shall complete the following studios courses:

|                                                           |            |
|-----------------------------------------------------------|------------|
| MUDT1001 Strategic and New Town Urban Design Studio       | 12 credits |
| MUDT1002 Public Transport Interchange Urban Design Studio | 12 credits |

#### Capstone Experience (Compulsory)

Candidates shall complete the following capstone experience course:

|                                                                            |            |
|----------------------------------------------------------------------------|------------|
| MUDT1003 Research Dissertation and Urban Design & Transport Thesis Project | 30 credits |
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And a total of 18 credits of Elective Courses as specialization selected from a list approved from time to time. Candidates' selection of courses shall be approved by the Head of the Department.

#### Elective Courses | 18 credits

|                                                                                      |
|--------------------------------------------------------------------------------------|
| CIVL7006 Optimization Techniques for Transportation Applications                     |
| URBP6157 Transport Economics                                                         |
| URBP6131 Transport Policy and Planning                                               |
| MUDT5010 Transport Network Analysis, Modelling and Project Appraisal                 |
| URBP6006 Planning, Managing and Financing the Development Process                    |
| URBP6003 Planning Practice, Law and Ethics in Hong Kong                              |
| URBP8003 Land and Real Estate Markets: Smart Governance, Finance and Business Models |
| URBP7006 GIS and Smart Technology in Spatial Planning                                |
| MHMP6858 Housing Economics                                                           |
| MHMP7007 International Housing Policies and Practices                                |
| MHMP8008 Transitional Cities: Urban and Housing Development                          |
| URBP6904 Housing Planning, and Sustainability                                        |

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## CORE COURSES (Compulsory)

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### MUDP1030 Morphologies and Urban Design Theories

| 6 credits

This course introduces 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

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### 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 techniques on spatial data analysis.

Assessment: 100% continuous coursework assessment

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### 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

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### 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, analyse, 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

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### **MUDT3010 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, neighbourhood, 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 constraints 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

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### **MUDP2010 Research Methods and Techniques**

**| 6 credits**

The course introduces research design and research methodology and their limitations appropriate for urban design. Topics include: research paradigms, the emergence of design research, formulation of research questions; range of research methods and resources needs; choices of research methods and limitations; formulation of research proposals; use of digital techniques in urban design research.

Assessment: 100% continuous coursework assessment

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### **GEOG7001 Survey and Data Analysis in Transport Studies**

**| 6 credits**

Surveys are commonly used to collect useful data in transport studies. A myriad of survey methods and instruments are available. This course covers the major aspects including survey design, sampling, hypothesis testing, interview and questionnaire design, survey implementation and administration, computer-based data processing, analysis and retrieval and report writing. Different aspects of surveys are discussed with reference to the transport-related professions and disciplines in different political and socio-economic contexts. Examples include travel characteristics, origin-destination, freight and public transport surveys conducted in Hong Kong and the other parts of the world. The fundamentals of spatial and non-spatial data analysis are covered using selected software. Moreover, some key opportunities and challenges of big data are discussed.

Assessment: 100% continuous coursework assessment

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### **CIVL6007 Behavioral Travel Demand Modelling**

**| 6 credits**

Demand theory; statistical models; survey methods in transport; land use transportation models; disaggregate choice models; behavioural concepts in choice modelling.

Assessment: All courses offered by the Department of Civil Engineering are assessed through examination (70%) and coursework continuous assessment (30%).

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## Studio Courses (Compulsory)

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The Studios are the critical component of the MSc programme. The design studios link the theories and issues raised in the core and elective courses with the practical analysis of urban design, transport and accessibility issues and the formulation of proposals for soft and hard interventions. The courses lead students through the process of experiential and problem-based learning in urban design, transport and accessibility and engaging with the different ways urban design, transport and accessibility relates to policy development, planning processes, legal contexts, financing Instruments, multi-scale configuration and organisation and the existing and emerging values of complex urban societies. Each studio focuses on important aspects of urban design, transport, mobility and accessibility fields both informed by research about design and creative modes of research for design and by/through design.

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### MUDT1001 Strategic and New Town Urban Design Studio

| 12 credits

This is the first urban design and transport studio in the Programme. The course introduces key concepts and principles of strategic urban design, transport, and accessibility at a range of spatial scales (both process and content) with a focus on spatial intervention scale such as New Town, New Area, New District, urban extension and their contemporary equivalent (e.g., eco-city). A deep experiential format includes recent past spatial studies of HK, Shenzhen, and Singapore New Towns (NT), NT visits, NT projects reviews, studio-based tutorials, and engagement with Hong Kong generation of NT. Students acquire strategic urban design and transport-mobility-accessibility analytical and design skills through a series of project-based stages. Students are also introduced to and develop a proficiency in graphic (computer 2D/3D visualizations) and 2D and 3D urban design analytics visualisation, written and oral communication skills associated with urban design reviews attended by external professionals. Students get experience of working in teams of four or five preparing and making presentations of preliminary strategic urban design options while further developing individual urban design capacity, learning critically the importance of spatial configuration and their resulting impacts.

Assessment: 100% continuous coursework assessment

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### MUDT1002 Public Transport Interchange Urban Design Studio

| 12 credits

In large metropolis, Public Transport Interchange (PTI) and its service area is an everyday experience. PTI are associated with Transit Oriented Development as one of the most successful attempts made worldwide to achieve sustainable urban development through promotion of high-density public transport nodes. Increasingly interchange service area and TOD have become multi-levels, mixed uses, integrating community amenities and public spaces to become proliferating mega-structure. PTI and TOD design investments are variable with mixed results. This studio is designed to engage student's understanding and designing of the complex multi-faceted transport, mobility-accessibility and urban design nature of contemporary interchange and its service area. Hong Kong has a wide range of PTI-TOD configurations. An international field study visit expands the understanding of emerging issues and design. Students will have opportunities to practise and refine questionnaire design, survey, and data analysis. Students get experience of working in teams preparing and making presentations of preliminary strategic urban design options while further developing individual urban design capacity, learning critically the importance of spatial configuration and their resulting impacts.

Assessment: 100% continuous coursework assessment

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## Capstone Experience (Compulsory)

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### **MUDT1003 Research Dissertation and Urban Design & Transport Thesis Project | 30 credits**

The research dissertation in urban design and transport and the urban design thesis project are the culmination of the MSc Programme. The course is independently led by the student with supervision.

The course has three components: a research dissertation about urban design and transport in the manner of academic research paper, an urban design & transport thesis project proposal and an urban design & transport thesis project report in the manner of a design report. The urban design project should be informed by the research component and should demonstrate knowledge, use and limitations of research about design, research for design and research by design.

The research dissertation and the design report are respectively 6,000 words  $\pm 10\%$  and 3,000 words  $\pm 10\%$  long excluding bibliography, abstracts, contents, list of illustration etc. Supplementary materials are allowed as appendix.

The urban design & transport thesis project includes mandatory design review of options and preferred option.

The candidate shall present the research dissertation no later than 30 May or on a date approved by the Head of Department in the final year of study. The dissertation must be related to the candidate's area of optional specializations selected. The examiners may prescribe an oral examination about the dissertation.

Assessment: 100% continuous coursework assessment

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## **ELECTIVE COURSES<sup>1</sup>**

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### **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

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### **URBP6003 Planning Practice, Law and Ethics in Hong Kong | 6 credits**

This course provides a detailed understanding of professional planning practice in Hong Kong. It deals with the practical dimensions of planning in both the public and private sectors. The course reviews the

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<sup>1</sup> Choice of the above courses is subject to prior approval by the Head of Department/Programme Director concerned. Not all courses are available each year. Priority will be given to students of the relevant curricula. Please refer to the respective curriculum syllabuses for the course descriptions.

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; 30%-40% examination

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### **CIVL7006 Optimization Techniques for Transportation Applications**

**| 6 credits**

Linear programming, non-linear programming, network optimization, and integer optimization methods for solving transportation problems.

Assessment: All courses offered by the Department of Civil Engineering are assessed through examination (70%) and coursework continuous assessment (30%), the weightings of which are subject to approval by the Board of Examiners.

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### **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 privatization. The course also introduces the functions, principles and methods of valuation.

Assessment: 100% continuous coursework assessment

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### **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: 100% continuous coursework assessment

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### **MHMP7007 International Housing Policies and Practices**

**| 6 credits**

This course aims to compare housing policies and practices at an international scale and to explore global housing issues. It examines and compares the evolution of housing policies in different housing systems, the modes of intervention in the housing markets, the roles of the public and private sectors in housing provision, housing finance systems, and the relationships between housing standards and societal conditions. Prevailing global trends and issues in housing are also examined.

Assessment: 100% continuous coursework assessment

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### **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

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### **URBP7006 GIS and Smart Technology in Spatial Planning**

**| 6 credits**

This course introduces the basic concepts, methods and techniques in the use of geographic information system (GIS) and smart technologies as a spatial planning support system in urban planning and smart cities development. It examines the challenges and opportunities of using emerging urban data for the development of smart cities and regions through urban analytical methods such as GIS, remote sensing, big data, and open data.

Assessment: 100% continuous coursework assessment

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### **URBP6006 Planning, Managing and Financing the Development Process**

**| 6 credits**

Planning in a development process needs to take into account a variety of spatial, sectoral, resources management and financial factors. This course examines the interactions of these factors in development processes initiated by the public sector, the private developers or through various modes of public-private partnership. The intersectoral and spatial implications of the development processes will be explored through case studies of planning at different geographical scales in the context of Hong Kong.

Assessment: 100% continuous coursework assessment

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### **URBP8003 Land and Real Estate Markets: Smart Governance, Finance and Business Models**

**| 6 credits**

This course provides a land and real estate development perspective on urban development. Cities face continuous processes of both expansion and transformation. Population growth and economic growth lead to expansion, while processes of obsolescence and decline lead to a demand for urban transformation projects. These processes usually require investments in land and property (re)development, while planning interventions provide guidelines to investors, sometimes as opportunities, but also as barriers to what an investor might see as a profitable investment. The interaction between planning interventions on the one hand and land and real estate investments on the other hand is the central theme of this course. Starting from that interaction the course pays attention to different planning approaches and their impact on land and real estate markets, the dynamics of land and real estate markets, investment behaviour by private and public developers, public private partnerships, land management strategies and value capturing mechanisms and smart land and real estate investment strategies.

Assessment: 100% continuous coursework assessment

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### **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; 40%-60% examination

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### **MUDT5010 Transport Network Analysis, Modelling and Project Appraisal**

**| 6 credits**

This course introduces a range of advanced analytical methods for urban design and transport planning. Topics include transport simplex and multiplex network analysis, machine learning, explainable AI (or xAI), and urban modelling and simulation, as well as how these techniques can be used for preliminary urban design and transport appraisal. While four stages modelling and appraisal approaches and micro simulations are classical approaches and are still important, this course aims to enhance students' knowledge and skills in the leading-edge development of analytical urban design and transport planning with agile and design sensitive methodology within the wider economic impact of transport framework. The course requires students to demonstrate their understanding of the theories and techniques by completing individual and group project assignments on the value of optioning and evidence-based thinking in urban design and transport.

Assessment: 100% continuous coursework assessment

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