

# International Master's Degree Program in Smart-Digital Urban Planning

## Introduction

In response to the development needs of digital cities and the intelligent needs of planning and governance, digital Intelligent City Planning takes urban space as the object and realizes efficient utilization, reasonable layout, dynamic governance and sustainable development of urban space resources through data-driven, data mining and intelligent algorithm optimization. Based on Tongji University's first-level discipline of Urban and Rural Planning, the Master's Program in Digital Intelligent City Planning is an emerging discipline that integrates theory with practice, and is interdisciplinary in nature, intersecting with Artificial Intelligence, Informatics, Remote Sensing, and Management. This program aims to cultivate high-level professionals with interdisciplinary backgrounds, who are well-versed in urban planning theories as well as methods and technologies of artificial intelligence, and who possess both innovative capacity and practical competence in the field of Digital Intelligent City Planning.

The construction of the Digital Urban Planning Master's degree is centered on the Department of Urban Planning of Tongji University. It cooperates with a number of information technology companies such as Tencent, AutoNavi, Baidu, SuperMap Group, Shanghai Maice Data Technology Co., Ltd., as well as leading companies in the planning and design industry such as Shanghai Tongji Urban Planning and Design Institute Co., Ltd., Shanghai Urban Planning and Design Institute, and China Urban Planning and Design Institute to jointly build an industry-education integration talent training platform, providing a solid guarantee for the all-round training of high-level talents in this major.

There are 15 teachers in the Digital Intelligent City Planning Master's Degree Program, including 2 academicians of the Chinese Academy of Engineering, and more than 70% of the teachers have senior professional titles. With the Department of Urban Planning of Tongji University as the core, the Ministry of Natural Resources' Key Laboratory of Land and Space Intelligent Planning Technology, the Ministry of Education's Key Laboratory of High-density Human Settlement Environment Ecology and Energy Conservation, the

Provincial and Ministerial Collaborative Innovation Center for Intelligent Planning of the Yangtze River Delta Urban Agglomeration, the UNESCO World Heritage (Asia-Pacific) Training and Research Center, the Tongji University-Asian Development Bank "Urban Knowledge Center", and the two academic journals "Journal of Urban Planning" and "GUIHUA", etc. jointly support the formation of a teaching-research-consulting integrated digital intelligent city planning professional leading talent training platform.

This field awards Master' s Degree in Digital Intelligent City Planning.

## **Goal**

To cultivate high-level and innovative talents with all-round development in morality, intelligence, physique, art and labor to become global professional elites leading the future digital intelligent city planning.

According to the needs of world and national strategies, socioeconomic development, and engineering construction, the program is designed to cultivate students with a systematic command of the theories, methodologies, and the application of digital intelligence technologies to urban planning scenarios, along with a solid understanding of the fundamental theories and knowledge of related fields. Students are expected to demonstrate strong abilities in problem discovery and analysis, possess comprehensive programming knowledge, and be proficient in technologies such as Geographic Information Systems (GIS), big data, and artificial intelligence, enabling them to apply modern information technologies to solve scientific problems in urban planning. The program also aims to develop students' coordination and organizational skills, professional ethics, and international vision, preparing them to undertake professional technical or managerial roles in the field of digital intelligent city planning.

## **Research field**

- 1.Digital and Intelligent City System Research and Development
- 2.Intelligent Urban Planning Application Technology Development
- 3.Smart Simulation and Governance of Urban Scenarios

## **Study period**

The duration of schooling is 2.5 years with a maximum of no more than 4 years.

Training method: full-time off-the-job learning is adopted, which consists of three main links: course learning, professional practice, and degree thesis or degree application practice results. The dual tutor system is encouraged. The tutor is a teacher with corresponding qualifications from the school, and the deputy tutor is an expert with a senior professional title in the enterprise or other technical experts with rich engineering practice experience.

## **Credit requirement**

1. Professional degree graduate students should complete at least 37 credits, including 6 credits for public degree courses, 12 credits for professional degree courses, 8 credits for non-degree courses (including at least 1 inter-college or interdisciplinary course with 2 credits), and 11 credits for compulsory courses (including 1 credit for dissertation topic selection, 2 credits for the graduate students' dissertation writing and academic norms, 2 credits for Tongji advanced lectures and 6 credits for professional practice).

2. The degree courses include mandatory and elective courses. All the master candidates of the Digital Intelligent City Planning program must take all the mandatory courses; the elective courses are optional according to student's research orientations.

3. As required by university, the candidates must take at least 1 course provided by other colleges.

4. In addition to participating in dual degree programs, coursework (including Tongji advanced lectures) should, in principle, be completed during the first 3 academic semesters.

5. In principle, course study (including Tongji Advanced Lecture Courses) should be completed in the 1st to 1.5th academic year (within the first 3 semesters).

## **Dissertation**

Graduate students should complete their theses under the supervision of their tutors.

1. Thesis or practical results selection: The thesis or practical results selection should be an important topic in the research direction of the subject and have a clear research goal. The topic selection should be completed no later than the third semester after admission. Those who fail the first time need to apply for a second topic selection after 3 months. The topic selection of master's students can be completed in the second semester in advance.

2. Mid-term assessment: Mid-term assessment is a comprehensive examination of the first half of the master's course learning and training practice. The mid-term assessment of a 2.5-year master's degree student is generally completed no later than the third semester after admission; the mid-term assessment of a 3-year master's degree student is generally completed no later than the fourth semester. Those who fail the first time need to apply for another assessment after 6 months.

3. Blind Review: Blind review is the anonymous evaluation of the thesis. The thesis can only proceed to the formal review process after passing the blind review. Master's theses are subject to blind review in accordance with the proportion set by the university.

4. Review and defense: Review and defense are the evaluation of the dissertation by peer experts. Before the defense, the master's degree thesis should be submitted to at least 2 peer experts for review; the master's degree thesis defense committee consists of 3-5 people.

5. Confidential theses: The confidentiality management of confidential degree theses and degree applications shall be carried out in accordance with the relevant management regulations of Tongji University.

### **Research requirement**

The innovative results of the degree thesis or the practical results of the degree application are important references for evaluating the level of the degree thesis. They must be obtained by the degree applicant during the degree-seeking period and be closely related to the content of the degree thesis.

It shall be implemented in accordance with the degree standards and regulations

formulated by the discipline and shall be consistent with the degree standards and regulations submitted to the school for filing. This major does not require degree applicants to publish academic achievements.

### **Exit Mechanism**

1. Full-time master's students who fail more than three courses (including three) during their studies, and part-time master's students who fail more than five courses (including five) during their studies will be expelled.

2. Students who fail the thesis selection or mid-term assessment twice will be deemed to have automatically terminated their studies and will be expelled.

3. Students who fail to pass the mid-term assessment within the academic system will be expelled.

### **Note**

Courses are generally arranged in the first to the first and half academic years. In the compulsory links, dissertation writing and academic norms, topic selection and Tongji advanced lectures must be completed before the mid-term assessment.

There should be at least a 2-month interval between the topic selection and the mid-term assessment and a 6-month interval between the mid-term assessment and the thesis defense. Thesis research should be combined with professional practice and there should be no shorter than one year professional practice.

Tongji Advanced Lectures is high-level academic lectures organized by the Graduate School and colleges. Graduate students should attend no less than 16 academic lectures listed in the management of Tongji Advanced Lectures before the mid-term assessment, and put their reflection into the management information system for graduate students.

Professional practice: A management system for professional practice should be formulated according to the professional degree category, and the practice methods, organizational management and assessment plans should be clarified. In terms of organizational management, the school tutor, industry and enterprise tutor and graduate

students should jointly formulate a practice plan and clarify the task requirements of the practice. The professional practice time of engineering master's degree students with 2 years or more of enterprise work experience should be no less than 6 months, and the professional practice time of engineering master's degree students without 2 years of enterprise work experience should be no less than 1 year. The content of the assessment plan includes the selection of the assessment team, the assessment time, the assessment content, the assessment method and the evaluation criteria. The design of the assessment plan should comply with the guiding training plan and basic degree requirements of the National Teaching Committee of this professional degree category, focus on the talent training goals, and pay attention to the effectiveness of cultivating the innovative practical ability of graduate students.

## Appendix

<b>Coure Type</b>	<b>Course Name</b>	<b>Credits</b>	<b>Class Hours</b>	<b>Semester</b>	<b>Compulsory</b>	<b>Remarks</b>	
Public compulsory courses	First Foreign Language (Japanese)	3	64	S & A	No	First Foreign Language  Credits=3.0	
	First Foreign Language (Russian)	3	64	S & A	No		
	First Foreign Language (French)	3	64	S & A	No		
	English Academic Literature Reading and Translation	1.5	32	S & A	No		Choose 2 out of 4 for First Foreign Language (English)
	Academic English Writing II	1.5	32	S & A	No		Choose 2 out of 4 for First Foreign Language (English)
	An Introduction to Chinese Culture in English II	1.5	32	S & A	No		Choose 2 out of 4 for First Foreign Language (English)

English Audio-Visual & Speaking for International Communication II	1.5	32	S & A	No		Choose 2 out of 4 for First Foreign Language (English)
First Foreign Language (German) 1	1.5	144	A	No		Compulsory for Sino-German Program
First Foreign Language (German) 2	1.5	144	S	No		Compulsory for Sino-German Program
First Foreign Language (Chinese)	3	64	S & A	No		Compulsory for International Students
Theory and Practice of Socialism with Chinese Characteristics for a New Era	2	32	S & A	No	Political Course, Credits $\geq$ 2.0	
Introduction to Dialectics of Nature	1	16	S & A	Yes		
Survey of China (English) I	1.5	32	S & A	No		Only for international students taking English-taught programs

	Survey of China (English) II	1.5	32	S & A	No		Only for international students taking English-taught programs
	Survey of China	3	54	S & A	No		Only for international students taking Chinese-taught programs
Professional compulsory courses	Urban-rural Theories and Practices	2	32	A	Yes		
	Urban Research Methodology	1	16	A	Yes		
	Urban Design	2	64	S & A	Yes		
	Evidence Synthesis Methods in Urban Research and Planning	1	16	S	Yes		
	Review of Urban Development Strategies	1	16	S & A	No		
	AI-assistant Spatial Planning	2	32	S & A	Yes		
	Urban Transportation	2	32	A	Yes		

	Urban System Analysis and Decision Optimization	1	16	S	Yes		
Professional elective courses	Urban Culture, Society and Space	1	16	A	No		
	Urban Sociology	1	16	S	No		
	Urban Housing Policy	1	16	A	No		
	Case Studies in Spatial Planning	1	16	A	No		
	Urban transportation research methods and topics	1	16	S	No		
	Urban and Rural Blue-Green Infrastructure for Climate Change Adaptation	1	16	S	No		
	Urban Design Analytics	1	16	A	A		
	Urban Modelling and Interpretation	1	16	S & A	Yes		

	AI Technology and Healthy City Design	1	16	S	No		
	Case Study and Criticism in Urban Design	2	32	S	No		
	Frontier practice of landscape architecture	2	32	A	No		
	The Making of Modern Cities	2	32	A	No		
Compulsory sessions	Professional Practice	6	108	S & A	Yes		
	Thesis Writing and Academic Norms	2	32	S & A	Yes		
	Thesis Topic Selection	1	0	S & A	Yes		
	Tongji Advanced Lecture Hall	2	32	S & A	Yes		
	Mid-term Assessment	0	0	S & A	Yes		