

交通工程

Traffic Engineering

专业代码: 081802

学 制: 4 年

Program Code: 081802

Duration: 4 years

培养目标:

本专业培养能坚持社会主义道路, 德智体全面发展, 并能从事公路与城市道路交通系统监测与预测、交通数据处理与分析、交通控制与管理、交通规划设计、交通系统建模与仿真等工作的高级技术人才。目标是使学生掌握扎实的专业基本原理和技术方法, 具备将所学基础知识应用到交通工程实践中去的能力, 具有团队精神和领导能力、终身学习和创新能力、国际化视野和新环境适应能力; 毕业后 5 年左右, 学生大部分能成为交通工程领域的技术骨干、专业科研人员、中高级管理人才、行业精英和领导者。

Educational Objectives:

This major aims to train qualified professionals with the socialism belief and well developed morally, intellectually and physically. The well-trained professionals can be dedicated into the fields of transport and transportation, including monitor and forecast of highway and urban road system, traffic data processing and analysis, traffic control and management, traffic planning and design, modeling and simulation of traffic system, etc. The objective of the major is to enable students to steadily master the professional basic principle and technical methods, and put them into practical use on traffic engineering. Moreover, all graduates also have team spirit and leadership ability, life-long learning and innovation ability, international vision and the ability to adapt new environment. Five years later, most graduates can become professional R&D experts, senior managers, industry elites and leaders.

毕业要求:

№1.工程知识: 能够将数学、自然科学、工程基础和专业知用于解决复杂工程问题。

№2.问题分析: 能够应用数学、自然科学和工程科学的基本原理, 识别、表达、并通过文献研究分析复杂交通工程问题, 以获得有效结论。

№3.设计/开发解决方案: 能够设计针对复杂交通工程问题的解决方案, 设计满足特定需求的系统、单元(部件)或工艺流程, 并能够在设计环节中体现创新意识, 考虑社会、文化以及环境等因素。

№4.研究: 能够基于科学原理并采用科学方法对复杂交通工程问题进行研究, 包括设计实验、分析与解释数据、并通过信息综合得到合理有效的结论。

№5.使用现代工具: 能够针对复杂工程问题, 开发、选择与使用恰当的技术、资源、现代工程工具和信息技术工具, 包括对复杂工程问题的预测与模拟, 并能够理解其局限性。

№6.工程与社会：能够基于工程相关背景知识进行合理分析，评价专业工程实践和复杂交通工程问题解决方案对社会、经济、以及文化的影响，并理解应承担的责任。

№7.环境和可持续发展：能够理解和评价针对复杂工程问题的专业工程实践对环境、社会可持续发展的影响。

№8.职业规范：具有人文社会科学素养、社会责任感，能够在工程实践中理解并遵守工程职业道德和规范，履行责任。

№9.个人和团队：能够在多学科背景下的团队中承担个体、团队成员以及负责人的角色。

№10.沟通：能够就复杂交通工程问题与业界同行及社会公众进行有效沟通和交流，包括撰写报告和设计文稿、陈述发言、清晰表达或回应指令。并具备一定的国际视野，能够在跨文化背景下进行沟通和交流。

№11.项目管理：理解并掌握工程管理原理与经济决策方法，并能在多学科环境中应用。

№12.终身学习：具有自主学习和终身学习的意识，有不断学习和适应发展的能力。

Student Outcomes:

№1.Engineering Knowledge: An ability to apply knowledge of mathematics, science, transportation engineering fundamentals and engineering specialization to the solution of complex transportation engineering problems.

№2.Problem Analysis: An ability to identify, formulate and analyze complex transportation engineering problems, reaching to substantiated conclusions using basic principles of mathematics, science, and engineering.

№3.Design / Development Solutions: An ability to design solutions for complex transportation engineering problems and innovatively design systems, components or process that meet specific needs with societal, public health, safety, legal, cultural and environmental considerations.

№4.Research: An ability to conduct investigations of complex transportation engineering problems based on scientific theories and adopting scientific methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

№5.Applying Modern Tools: An ability to create, select and apply appropriate techniques, resources, and modern transportation engineering and IT tools, including prediction and modelling, to complex transportation engineering activities, with an understanding of the limitations.

№6.Engineering and Society: An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional transportation engineering practice.

№7.Environment and Sustainable Development: An ability to understand and evaluate the impact of professional engineering solutions in environmental and societal contexts and demonstrate knowledge of and need for sustainable development.

№8.Professional Standards: An understanding of humanity science and social responsibility, being able

to understand and abide by professional ethics and standards responsibly in transportation engineering practice.

№9. Individual and Teams: An ability to function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.

№10. Communication: An ability to communicate effectively on complex transportation engineering problems with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions, and communicate in cross-cultural contexts with international perspective.

№11. Project Management: Demonstrate knowledge and understanding of transportation engineering management principles and methods of economic decision-making, to function in multidisciplinary environments.

№12. Lifelong Learning: A recognition of the need for, and an ability to engage in independent and life-long learning with the ability to learn continuously and adapt to new developments.

专业简介:

本专业属于自然科学-工程科学领域，1994年在广东省交通厅的支持下成立，是国内最早成立的交通工程专业之一，目前拥有国内领先的办学环境和条件，为全国、特别是珠三角地区输送了大批优秀的人才，具有良好的业界口碑，目前本专业正朝着国际一流的发展目标快速前进。在我国交通工程事业快速发展的大背景下，本专业近20年承担了多项国家、省部重大科研课题，完成了多项示范性工程项目，引领国内交通工程学科的发展，并较好地服务了经济发展、尤其是地方交通工程事业。本专业教师全部具有博士学位，其中80%以上的教师具有海外学习、工作经历，60%以上的教师具有高级职称。

本专业依托广东省智能交通信息与控制工程技术研究中心，已具备交通大数据实验室、交通监控实验室、ITS信息平台实验室、交通仿真实验室等实验室及相配套的软硬件设施及完备的图书资料，并依托多个行业著名企事业单位建立校外实习基地。近几年本专业建立了良好的国际合作办学、学术交流渠道，有多名学生赴美国、英国、澳大利亚等国家著名高校联合培养。

Program Profile:

The major of Transportation Engineering in our faculty education belongs to the interdisciplinary subject of natural science and engineering, and was established with the funding support of the Department of Transport of Guangdong Province in 1994. As one of the earliest-established Transportation Engineering subjects in mainland China, we have the leading college educational infrastructures and conditions. Our group has cultivated lots of talents especially for the Pearl River Delta region, thus having a high reputation.

In the recent 20 years, our group not only leads the development of Transportation Engineering in the nation, but has undertaken number of major scientific research projects from central and local

governments and built up many demonstration effects in the industry of transport and transportation. Especially, all faculties of the Department of Transportation Engineering have Ph.D. degree, over 80% of them have oversea education or research experience, and 60% senior professional title.

With the support of Guangdong Intelligent Transportation Information and Control Engineering Tech Research Center, the transportation engineering group has established many professional labs and owned related facilities of software and hardware, Transportation Big Data Lab, Traffic Surveillance Lab, ITS Information Platform Lab Traffic Simulation Lab etc. Moreover, we have also reached cooperative agreements with many well-known enterprises and institutions to construct off-campus internship or practical bases. Recently, our group has built international cooperation and collaboration in education and academic exchange with some famous universities in USA, UK, and Australia and so on.

专业特色:

本专业以道路交通为主要对象、兼顾综合运输体系，以交通信息工程、智能控制工程为特色，培养具备交通系统监测与预测、交通数据处理与分析、交通控制与管理、交通规划设计、交通系统建模与仿真等专门知识，能在相关交通行业单位从事规划、设计、开发、科研等工作的高级技术人才。

Program Features:

This major mainly focuses on the development of highway transportation, and takes compressive transportation into account. Particularly, the subjects of traffic information engineering and intelligent traffic control engineering are recognized as characteristic specialty. The students of this specialty must take the professional courses of monitor and forecast of highway and urban road system, traffic data processing and analysis, traffic control and management, traffic planning and design, modeling and simulation of traffic system, etc. And then, they can be trained into high-level engineering professionals who take up job positions in the fields of planning, designing, research and development.

授予学位: 工学学士学位

Degree Conferred: Bachelor of Engineering

主干课程:

交通调查与分析、交通工程概论、交通规划、交通设计、交通控制与管理、交通数据库设计、交通系统仿真、交通流理论与道路通行能力、公共交通系统、交通机电工程。

Main Courses:

Traffic Survey and Data Analysis, Introduction to Traffic Engineering, Transportation Planning, Traffic Design, Traffic Control and Management, Traffic Database Design, Traffic System Simulation, Traffic Flow Theory and Highway Capacity Analysis, Public Transit System, Electro-Mechanical Engineering

for Transportation.

特色课程：

全英语教学课程：公共交通系统，交通规划

双语教学课程：交通流理论与道路通行能力、智能交通系统、交通系统仿真

研究型课程：交通设计、交通规划、交通控制与管理、交通系统仿真

讨论型课程：现代交通新技术、智能交通系统

专题研讨课：交通安全与法规、交通运输工程学

专题设计课：交通设计，交通数据库设计

创新实践课程：综合实验、毕业实习、交通规划课程设计、交通数据库设计课程设计、交通设计课程设计、交通控制与管理课程设计

创业教育课程：现代交通技术产业模式与创业

Featured Courses:

Courses Taught in English: Public Transit System, Transportation Planning

Bilingual Courses: Traffic Flow Theory and Highway Capacity Analysis, Intelligent Transportation System, Traffic System Simulation

Research Courses: Traffic Design, Transportation Planning, Traffic Control and Management, Traffic System Simulation

Discussion Courses: New Technology of Modern Traffic Engineering, Intelligent Transportation System

Topic-based Seminar Courses: Traffic Safety and Traffic Regulations, Transportation Engineering

Topic-based Design Courses: Traffic Design, Traffic Database Design

Innovation Practice Courses: Comprehensive Training Course of Traffic Engineering, Graduation Practice, Course Design for Transportation Planning, Course Design for Traffic Database Design, Course Design for Traffic Design, Course Design for Traffic Control and Traffic Management

Entrepreneurship Education Courses: Business Models and Entrepreneurship in Modern Traffic Technology

2.类别统计表 (Category Registration Form)

学时 Academic Hours					学分 Credits						
总学时数 Total	其中 Include		其中 Include		总学分数 Total	其中 Include		其中 Include			其中 Include
	必修学时 Compulsory	选修学时 Elective	理论教学学时 Theory Course	实验教学学时 Lab		必修学分 Compulsory	选修学分 Elective	集中实践教学环节学分 Practice-concentrated Training	理论教学学分 Theory Course Credits	实验教学学分 Lab	创新创业教育学分 Innovation and Entrepreneurship Education
2268	1732	536	1922	346	177	153.5	23.5	36	130	11	16

三、专业教学计划表 (Teaching Schedule)

类别 Course Category	课程代码 Course No.	课程名称 Course Title	是否必修 C/E	学时数 Total Curriculum Hours				学分数 Credits	开课学期 Semester	毕业要求 Student Outcomes
				总学时 Class Hours	上机 Computer-aided Class Hours	实验 Lab Hours	实践 Practice Hours			
公共基础课 General Basic Courses	143093	思想道德修养与法律基础 Cultivation of Thought and Morals & Fundamental of Law	必修 课	(40) (36)				2.5	1	No8、12
	143091	中国近现代史纲要 Skeleton of Chinese Modern History		(32) 24				2.0	2	No8、12
	143106	毛泽东思想和中国特色社会主义理论体系概论 Thought of Mao ZeDong and Theory of Socialism with Chinese Characteristics		(80) 48				5.0	3	No8、12
	143090	马克思主义基本原理 Fundamentals of Marxism Principle		(40) 36				2.5	4	No8、12
	143094	形势与政策 Analysis of the Situation & Policy		(128)				2.0	1-8	No8、12
	144001	大学英语(一) College English(1)		64				4.0	1	No10
	144002	大学英语(二) College English(2)		64				4.0	2	No10
	145223	大学计算机基础 Foundations of Computer		32				2.0	1	No5
	152001	体育(一) Physical Education (1)		32			32	1.0	1	No12
	152002	体育(二) Physical Education (2)		32			32	1.0	2	No12
	152003	体育(三) Physical Education (3)		32			32	1.0	3	No12
	152004	体育(四) Physical Education (4)		32			32	1.0	4	No12
	106001	军事理论 Military Principle		(16)				1.0	2	No7、9
	140191	微积分II(一) Calculus(1)		80				5.0	1	No1

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学 时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice Hours			
	140192	微积分II(二) Calculus(2)		80				5.0	2	No1
	140197	线性代数与解析几何 Linear Algebra & Analytic Geometry		48				3.0	1	No1
	140019	概率论与数理统计 Probability & Mathematical Statistics		48				3.0	2	No1
	140099	数学实验 Mathematical Experiments		48	32			2.0	2	No1
	130139	工程制图(一) Engineering Drawing(1)		48				3.0	1	No2
	130140	工程制图(二) Engineering Drawing(2)		32				2.0	2	No2
	145268	C++程序设计基础 C++ Programming Foundations		48				3.0	2	No5
	141005	大学物理III(一) General Physics(1)		64				4.0	2	No1
	141006	大学物理III(二) General Physics(2)		64				4.0	3	No1
	141007	大学物理实验(一) Physics Experiment(1)		32		32		1.0	2	No1
	141008	大学物理实验(二) Physics Experiment(2)		32		32		1.0	3	No1
		人文科学领域 Humanities	通 识 课	96				6.0		No8
		社会科学领域 Social Science		64				4.0		No8
		合 计 Total		1180	32	64	128	75.0		

三、专业教学计划表(续)(Teaching Schedule)

类别 Course Category	课程 代码 Course No.	课程名称 Course Title	是否 必修 C/E	学时数 Total Curriculum Hours				学分 数 Credits	开课 学期 Semester	毕业 要求 Student Outcomes
				总学 时 Class Hours	上机 Computer-ai ded Class Hours	实验 Lab Hours	实践 Practice Hours			
学科 基础 课 Disciplinary Basic Courses	133367	现代交通新技术 New Technology of Modern Transportation	必 C	16				1.0	1	No3、4
	133368	交通调查与分析 Traffic Survey and Analysis	必 C	32				2.0	4	No4、6
	135082	电工学基础 Fundamentals of Electrical Engineering	必 C	40		8		2.5	4	No4
	133317	交通运输工程学 Transportation Engineering	必 C	32				2.0	3	No4
	133266	交通工程概论 Introduction of Traffic Engineering	必 C	32		6		2.0	3	No4
	133092	工程力学II Engineering Mechanics	必 C	64				4.0	4	No4

	133148	交通数据库设计 Traffic Database Design	必 C	32	8			2.0	4	№4
	133250	交通设计 Traffic Design	必 C	48	8			3.0	5	№4、6
	133370	交通检测技术 Traffic Detection Technology	必 C	32		8		2.0	5	№4、6
	133216	交通规划 Transportation Planning	必 C	48	8			3.0	4	№4、6
	133265	交通控制与管理 Traffic Control and Management	必 C	48		8		3.0	6	№4、6
	142062	运筹学 Operations Research	必 C	48	8			3.0	3	№4
	133370	道路工程 Highway Engineering	选 C	48				3.0	3	№4
	133371	道路勘测 Road Survey	选 C	48				3.0	4	№4
	133460	交通运输经济学 Transportation Economics	选 C	40				2.5	5	№4
	133240	轨道交通概论 Introduction of Rail Transit	选 C	16				1.0	5	№4
	133231	预测与决策技术 Forecasting and Decision-Making	选 C	40				2.5	4	№4
	133333	应用数理统计学 Application of Mathematical Statistics	选 C	40	8			2.5	3	№4
	133252	地理信息系统 Geographic Information System	选 C	32	12			2.0	7	№4
	合 计 Total		必 C	424	24	30		26.5		
			选 E	选修课修读最低要求 15.5 学分 minimum elective course credits required:15.5						
专业领域课 Specialty-related Courses	133311	交通流理论与道路通行能力 Traffic Flow Theory & Highway Capacity	必 C	32				2.0	4	№4、6
	133371	现代交通通信技术 Communication Technology of Modern Transportation	必 C	32		8		2.0	5	№4、6
	133372	公共交通系统 Public Transportation Systems	必 C	48				3.0	6	№4、6
	133485	交通系统仿真 Traffic System Simulation	必 C	32		20		1.0	4	№4、6
	133251	交通机电工程 Traffic Eletromechanical Engineering	必 C	48				3.0	6	№4、6
	133124	综合实验 Comprehensive Experiment	必 C	32		32		1.0	6	№3
	133378	高速公路系统控制 Highway System Control	必 C	32				2.0	6	№4

133373	现代交通技术产业模式与创业 Industrial Model of Modern Transportation Technology & Entrepreneurship	必 C	16				1.0	7	№2
133217	科技文献检索 Sci-tech Literature Retrieval	必 C	16	8			1.0	4	№3
133484	城市规划原理 Fundamentals of City Planning	选 E	32				2.0	3	№4
133213	交通安全与法规 Traffic Safety & Rules	选 E	32				2.0	5	№4
133375	物流与供应链管理 Logistics and Supply Chain Management	选 E	32				2.0	6	№4
133376	工程项目管理 Engineering Project Management	选 E	32				2.0	6	№11
133177	智能交通系统 Intelligent Transportation System	选 E	32				2.0	5	№4
133332	汽车构造 Automotive Structure	选 E	48	8			3.0	6	№4
133344	汽车运用工程 Automotive Operation Engineering	选 E	32				2.0	7	№4
133345	轨道交通规划与设计 Planning and Design of Rail Transit	选 E	32				2.0	6	№4
120003	创新研究训练 Innovation Research Training	选 E	32				2.0		№12
120004	创新研究实践 I Innovation Research Practice I	选 E	32				2.0		№12
120005	创新研究实践 II Innovation Research Practice II	选 E	32				2.0		№12
120006	创业实践 Entrepreneurial Practice	选 E	32				2.0		№12
合 计 Total		必 C	288	8	60		16.0		
		选 E	选修课修读最低要求 9.0 学分 minimum elective course credits required: 9						

备注：学生根据自己开展科研训练项目、学科竞赛、发表论文、获得专利和自主创业等情况申请折算为一定的专业选修课学分（创新研究训练、创新研究实践 I、创新研究实践 II、创业实践等创新创业课程）。每个学生累计申请为专业选修课总学分不超过 4 个学分。经学校批准认定为选修课学分的项目、竞赛等不再获得对应第二课堂的创新学分。

四、集中实践教学环节(Practice-concentrated Training)

课程 代码 Course No	课程名称 Course Title	是否 必修 C/E	学 时 数 Total Curriculum Hours		学分数 Credits	开课 学期 Semester	毕业要求 Student Outcomes
			实践 Practice weeks	授课 Lecture Hours			
106002	军训 Military Training	必 C	3 周		3.0	1	№9
143197	马克思主义理论与实践 Marxism Theory and Practice	必 C	2 周		2.0	假期	№8
133269	认识实习 Cognition Practice	必	1 周		1.0	2	№1, 2, 3

130356	工程训练 I Engineering Training	必	2 周		2.0	4	№1,2
141073	电子工艺实习 II Electronic Technology Practice	必	2 周		2.0	5	№3,5,2
133466	生产实习（一） Production Practice(1)	必	1 周		1.0	4	№1,2
133313	交通数据库设计课程设计 Curriculum Design of Traffic Database Design	必	1 周		1.0	4	№3,5,4
133253	交通设计课程设计 Curriculum Design of Traffic Design	必	1 周		1.0	5	№3, 4,5, 6
133313	交通规划课程设计 Curriculum Design of Transportation Planning	必	1 周		1.0	4	№3, 4,5, 6
133314	交通控制与管理课程设计 Curriculum Design of Traffic Control and Management	必	1 周		1.0	6	№3, 4,5, 6
133467	生产实习（二） Production Practice(2)	必	2 周		2.0	6	№1,2
133257	毕业实习 Graduation Practice	必	4 周		4.0	8	№1,2,3,5,6
133273	毕业设计 Graduation Design	必	15 周		15.0	8	№1,2,3,5,6
合 计 Total		必 C	36 周		36.0		
		选 E	选修课修读最低要求 学分 minimum elective course credits required:				

五、第二课堂

第二课堂由人文素质教育和创新能力培养两部分组成。

1.人文素质教育基本要求

学生在取得专业教学计划规定学分的同时，还应结合自己的兴趣适当参加课外人文素质教育活动，参加活动的学分累计不少于 2 个学分。

2.创新能力培养基本要求

学生在取得本专业教学计划规定学分的同时，还必须参加国家创新创业训练计划或广东省创新创业训练计划或 SRP（学生研究计划）或百步梯攀登计划或一定时间的各类课外创新能力培养活动（如学科竞赛、学术讲座等），参加活动的学分累计不少于 4 个学分。

5.“Second Classroom” Activities

“Second Classroom” Activities are comprised of two parts, Humanities Quality Education and Innovative Ability Cultivation.

1)Basic Requirements of Humanities Quality Education

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in extracurricular activities of Humanities Quality Education based on one’s interest, acquiring no less than two credits.

2)Basic Requirements of Innovative Ability Cultivation

Besides gaining course credits listed in one’s subject teaching curriculum, a student is required to participate in any one of the following activities: National Undergraduate Training Programs for Innovation and Entrepreneurship, Guangdong Undergraduate Training Programs for Innovation and

Entrepreneurship, Student Research Program (SRP), One-hundred-steps Innovative Program, or any other extracurricular activities of Innovative Ability Cultivation that last a certain period of time (e.g. subject contests, academic lectures), acquiring no less than four credits.