土 木 工 程 留 学 生
本 科 培 养 方 案

（专业代码：081001　学制：四年　学位：工学学士）

一、培养目标

本专业培养适应现代土木工程发展需要，获得土木工程师基本训练，在本学科领域中具有一定的国际视野，能够在多个国家的实际环境中运用和发展本学科的知识、技能和方法，知华、友华、具备全球视野并具备参与国际交流与合作的初步能力。毕业后能从事有关土木工程的勘察、设计、施工、管理、教育等方面工作的高级土木工程师和高素质管理人才。

二、毕业要求及实现矩阵

毕业生应获得以下几方面的知识和能力：

1.汉语毕业要求：学生毕业前须通过汉语水平考试（HSK）4 级，具备基本的汉语听、说、读、写能力，能够适应在中国学习、生活及未来职业发展的语言需求。学生须完成以下指定课程并取得合格成绩：《中国概况（2-1）》《中国概况（2-2）》《初级汉语》《中级汉语》《高级汉语》。

2.工程知识：能够将数学、自然科学、工程基础和专业知识用于解决土木工程专业的复杂工程问题；

3. 查阅资料能力:基本掌握汉语,能够借助工具阅读和理解本专业的中文技术资料；具备在跨文化环境下的基础沟通与协作能力，能够适应多元文化工作环境；

4. 问题分析能力：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土木工程专业的复杂工程问题，以获得有效结论；

5. 设计/开发解决方案：能够设计（开发）针对土木复杂工程问题的解决方案，设计（开发）满足土木工程特定需求的体系、结构、构件（节点）或者施工方案，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素；

6. 研究：能够基于土木工程科学原理并采用科学方法，对土木工程专业的复杂工程问题进行研究，包括设计实验、收集、处理、分析与解释数据，通过信息综合得到合理有效的结论；

7. 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；

8. 工程与社会：能够基于土木工程相关的背景知识和标准，评价土木工程项目的设计、施工和运行的方案，以及复杂工程问题的解决方案，包括其对社会、健康、安全、法律以及文化的影响，并理解土木工程师应承担的责任；

9. 环境和可持续发展：能够理解和评价针对土木工程专业的复杂工程问题的工程实践对环境、社会可持续发展的影响；

10. 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行为规范，做到责任担当、贡献国家、服务社会；

11. 个人和团队：在解决土木工程专业的复杂工程问题时，能够在多学科组成的团队中承担个体、团队成员或负责人的角色；

12. 沟通：能够就土木工程专业的复杂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、表达或回应指令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；

13. 项目管理：在与土木工程专业相关的多学科环境中理解、掌握、应用工程管理原理与经济决策方法，具有一定的组织、管理和领导能力；

14. 终身学习：具有自主学习和终身学习的意识，具有提高自主学习和适应土木工程新发展的能力。

毕业要求及实现矩阵

毕业要求	观测点	课程
1. 工程知识：能够将数学、自然科学、工程基础和专业知识用于解决土木工程专业的复杂工程问题	1.1 掌握数学、自然科学等知识，能够应用数学、自然科学和工程科学的语言对土木工程专业的工程问题进行表述	高等数学 线性代数 大学化学 大学物理 大学物理实验
	1.2 掌握力学原理和方法，能够针对土木工程专业中具体的工程对象，建立合适的数学模型或力学模型并进行求解	材料力学 结构力学 理论力学 土力学
	1.3 掌握相关工程基础知识，能够应用相关知识和数学模型方法对土木工程专业复杂工程问题进行推演和分析	工程地质与水文地质 钢结构 混凝土结构 多层与高层建筑结构设计 基础工程 基坑工程 地基处理与加固
	1.4 能够利用系统思维的能力，将工程知识用于土木工程专业复杂工程问题解决方案的比较与综合，并体现本专业领域先进的技术	毕业设计 结构抗震 土木工程施工

毕业要求	观测点	课程
2. 基本掌握汉语，能够借助工具阅读和理解本专业的中文技术资料；具备在跨文化环境下的基础沟通与协作能力，能够适应多元文化工作环境。	2.1 具备基础汉语能力，能够借助工具阅读和理解中文专业资料	初级汉语口语 初级汉语精读 中级汉语 高级汉语 中国概况
	2.2 能够在跨文化环境中进行基础沟通与协作	毕业设计 认识实习
3. 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土木工程专业的复杂工程问题，以获得有效结论	3.1 能够应用数学、自然科学的基本原理，正确识别和判断土木工程专业复杂工程问题的关键环节	大学化学 大学物理 大学物理实验 高等数学 线性代数
	3.2 能够应用力学基础知识和方法，正确识别和表达土木工程专业复杂工程问题，并能选择合适的方法进行分析和求解	材料力学 结构力学 理论力学 土力学
	3.3 能认识到解决问题有多种方案可以选择，能够运用专业知识，并通过查阅行业标准和文献资料，寻求复杂工程问题可替代的解决方案	钢结构 混凝土结构 基础工程
	3.4 能运用基本原理，借助文献研究，并从可持续发展的角度分析工程活动过程的影响因素，获得有效结论	毕业设计
4. 设计/开发解决方案：能够设计（开发）针对土木复杂工程问题的解决方案，设计（开发）满足土木工程特定需求的体系、结构、构件（节点）或者施工方案，并能够在设计环节中体现创新意识，考虑社会、健康、安全、法律、文化以及环境等因素	4.1 掌握土木工程全周期、全流程的基本设计方法和技术，能够针对特定需求，确定工程基本单元的设计目标或问题解决方案，并完成设计（开发）工作	房建设计与 BIM 实践 建筑设计信息技术 钢结构 混凝土结构 多层与高层建筑结构设计 基础工程 基坑工程 地基处理与加固
	4.2 能够进行工程体系的系统分析和优化设计，并体现创新意识	毕业设计 混凝土结构课程设计
	4.3 能够进行施工方案、工艺流程等系统分析和优化设计，并体现创新意识	生产实习 施工组织实训 土木工程施工
	4.4 在设计中能够考虑公共健康与安全、节能减排与环境保护、法律与伦理，以及社会与文化等制约因素	毕业设计 混凝土结构课程设计 施工组织实训
5. 研究：能够基于土木工程科学原理并采用科学方法，对土木工程专业的复杂工程问题进行研究，包括设计实验、收集、处理、分析与解释数据，通过信息综合得到合理有效的结论	5.1 能够根据科学原理，通过文献研究或相关方法，调研和分析复杂工程问题的解决方案，并能够根据对象特征，合理选择研究路线，科学设计实验方案	材料力学 大学物理实验
	5.2 能够根据实验方案构建实验系统，安全地开展实验，正确地采集实验数据，对实验结果进行分析和解释，并通过信息综合获得合理有效的结论	材料力学 大学化学 大学物理实验
6. 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	6.1 了解土木工程专业常用的现代仪器、信息技术工具、工程工具和模拟软件的使用原理和方法，并理解其适用范围及局限性	大学计算机 大学物理实验 房建设计与 BIM 实践 画法几何与工程制图 有限元软件及应用
	6.2 能够选择与使用恰当的仪器、信息资源、工程工具和专业模拟软件，对复杂工程问题进行分析、计算和设计	工程测量学 工程测量实习 工程地质与水文地质实习

毕业要求	观测点	课程
	6.3 能够针对具体的工程问题对象，通过组合、选配、改进、二次开发等方式创造性地使用现代工具进行模拟和预测，满足特定需求，并能够分析其局限性	程序设计 房建设计与 BIM 实践 有限元软件及应用 毕业设计
7. 工程与社会：能够基于土木工程相关的背景知识和标准，评价土木工程项目的设计、施工和运行的方案，以及复杂工程问题的解决方案，包括其对社会、健康、安全、法律以及文化的影响，并理解土木工程师应承担的责任	7.1 了解土木工程专业相关领域的技术标准、知识产权、产业政策和法律法规，理解不同社会文化对工程活动的影响	土木工程概论 防灾减灾工程概论 行业实践 毕业设计
	7.2 能够分析并评价土木工程专业工程实践和复杂工程问题的解决方案对社会、健康、安全、法律、文化的影响，以及这些制约因素对项目实施的影响，并理解土木工程师应承担的责任	认识实习 行业实践 毕业设计 生产实习
8. 环境和可持续发展：能够理解和评价针对土木工程专业的复杂工程问题的工程实践对环境、社会可持续发展的影响	8.1 能够认识到土木工程相关活动中可持续发展的重要性，知晓和理解联合国可持续发展目标，知晓和理解绿色低碳、环境保护和可持续发展的理念与内涵	工程地质与水文地质 土木工程概论 防灾减灾工程概论 土木工程材料 绿色低碳建筑及评估
	8.2 能够从环境保护和社会可持续发展的角度思考土木工程专业工程实践的可持续性，评价其可能对人类和环境造成的损害和隐患，践行绿色环保理念	房建设计与 BIM 实践 土木工程材料 生产实习 绿色低碳建筑及评估
9. 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行为规范，做到责任担当、服务社会	9.1 了解中国概况，具有人文社会科学素养和社会责任感，有正确的人生观、世界观和价值观，理解个人与社会的关系，能够自觉践行社会主义核心价值观	中国概况 土木工程概论
	9.2 能够恪守工程伦理、理解并遵守工程职业道德和规范，尊重相关国家和国际通行的法律法规，在工程实践中能自觉履行工程师对公众的安全、健康和福祉的社会责任，理解包容性、多元化的社会需求	土木工程概论 认识实习 毕业设计 生产实习
10. 个人和团队：在解决土木工程专业的复杂工程问题时，能够在多学科组成的团队中承担个体、团队成员或负责人的角色	10.1 具有健康体格和良好的人际交往、协作配合能力，能在多学科、多元化、多形式（面对面、远程互动）的团队中与其他团队成员进行有效地、包容性地沟通与合作，能够在团队中独立或合作开展工作	工程测量实习 工程地质与水文地质实习 认识实习 毕业设计
	10.2 具有一定的组织管理和领导能力，能够组织、协调和指挥团队开展工作	毕业设计 生产实习
11. 沟通：能够就土木工程专业的复杂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、表达或回应指令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	11.1 能够就土木工程专业复杂工程问题与业界同行和社会公众进行交流，包括撰写报告和设计文稿、陈述发言、表达或回应指令	毕业设计 混凝土结构课程设计 生产实习 施工组织实训
	11.2 具有一定的国际视野，了解专业领域的国际发展趋势和研究热点，理解和尊重不同文化的差异性和多样性，具备跨文化交流能力，能够就专业问题在跨文化背景下进行基本沟通和交流	中国概况 认识实习

毕业要求	观测点	课程
12. 项目管理：在与土木工程专业相关的多学科环境中理解、掌握、应用工程管理原理与经济决策方法，具有一定的组织、管理和领导能力	12.1 能认识到工程项目中管理与经济决策的重要性，掌握工程项目中涉及的管理与经济决策方法	施工组织实训 土木工程施工 工程经济与项目管理
	12.2 了解工程全周期、全流程成本构成，理解其中的管理及经济决策问题，能够在多学科环境下，在设计、施工与管理中应用工程管理原理与经济决策方法，具备一定的工程项目管理能力	施工组织实训 土木工程施工 工程经济与项目管理
13. 终身学习：具有自主学习和终身学习的意识，具有提高自主学习和适应土木工程新发展的能力	13.1 能认识到自主和终身学习的必要性，具有追踪土木工程行业发展趋势的意识	行业实践 毕业设计
	13.2 具有自主学习的能力，包括对技术问题的理解能力、归纳总结能力和提出问题的能力等，并不断更新拓展知识，以适应社会与土木工程行业发展的需求	结构力学 毕业设计 生产实习

三、主干学科、专业核心课程

主干学科：土木工程

专业核心课程：理论力学、土木工程材料、材料力学、结构力学、土力学、基础工程、混凝土结构、钢结构、多层与高层建筑结构设计、土木工程施工、结构抗震

四、特色课程

（一）专业特色课程

专创融合课程：房建设计与 BIM 实践、混凝土结构

项目式课程：施工组织与工程造价实训、混凝土结构课程设计

“人工智能+”课程：建筑设计信息及技术

产教融合课：行业实践、生产实习

（二）在地国际化课程

全英语课程：除汉语类课程和中国概况等课程外，专业课程原则上采用英语授课。代表性课程包括理论力学、土木工程材料、材料力学、结构力学、土力学、基础工程、混凝土结构、钢结构等。

双语课程：初级汉语口语、初级汉语精读、中级汉语、高级汉、中国概况。

（三）其它课程

课程思政示范课程：道德与法律、中国概况、土木工程概论、结构抗震、认识实习

劳动教育实践课程：工程地质与水文地质实习、工程测量实习、生产实习

五、学分修读要求

本专业学生在学校规定的修业年限内需修满专业培养方案要求的 187 学分，并取得辅助学分要求的 10 学分，通过 HSK4 级，方可毕业；符合学士学位授予条件的，授予学士学位。

授予学位类型：工学学士学位。

课程类别		学分	所占比例	理论学时	实践学时	学时合计
通识教育	通识必修课程	43	23.12%	656	40	696
	通识选修课程	10	5.38%			
专业教育	学科基础课程	54	29.03%	734	94+4 周	828+4 周
	专业必修课程	76	40.86%	700	56+27 周	756+27 周
	专业选修课程	-	-			
自主发展	跨学科课程	3	1.61%			
	辅助学分	10	-			
毕业总学分（总学时）		186				
实践教学（含课内实验）		61.5	33.06%	-	190+27 周	190+27 周
集中性实践教学环节		35.5	19.09%	-	27 周	27 周

学期修读学分建议	学期	1	2	S1	3	4	S2	5	6	S3	7	8
	必修	22	20	1	20	24	2	19.5	26	4	16.5	18
	通识选修	0	0	0	0	0	0	0	4	0	6	0
	专业选修	0	0	0	0	0	0	0	0	0	0	0
	跨学科选修	0	0	0	0	0	0	0	0	0	3	0
	小计	22	20	1	20	24	2	19.5	30	4	26.5	18

六、课程设置

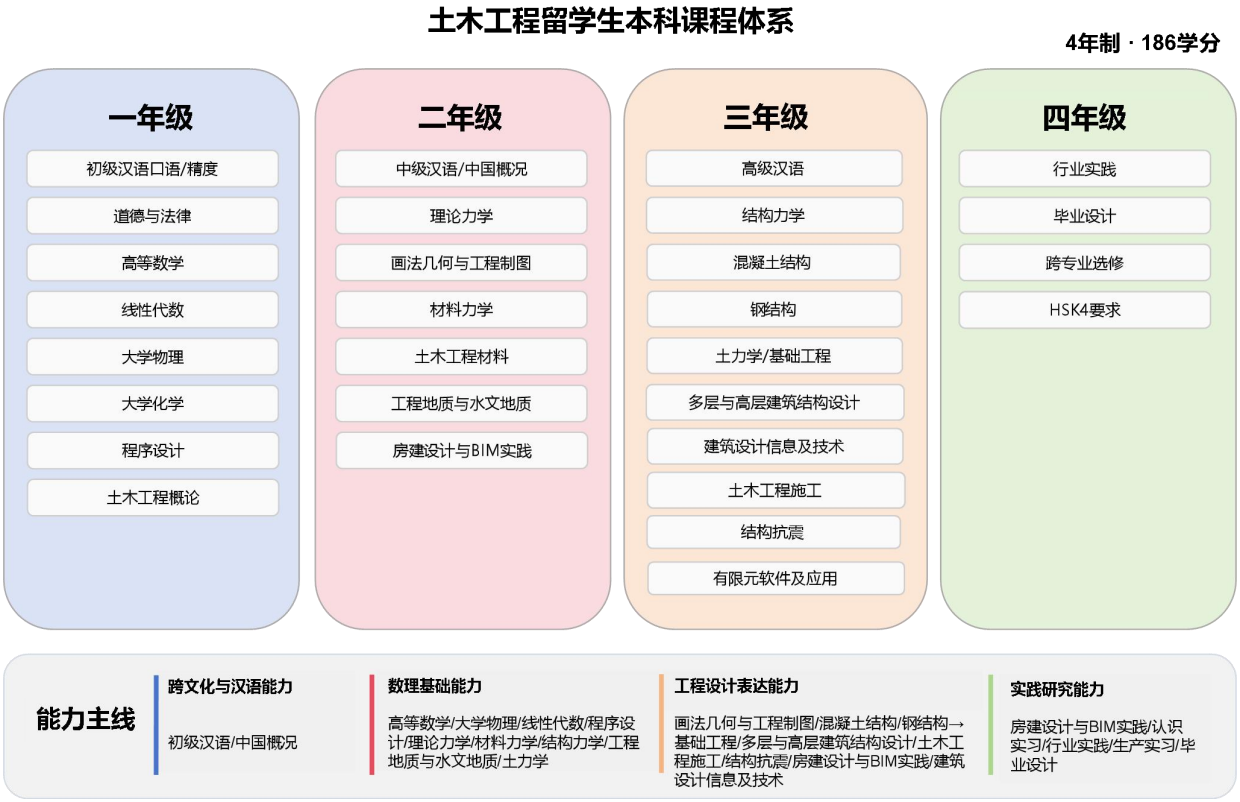
课程类别	课程模块	课程编码	课程名称	学分	课内学时					课外学时	学期	备注
					合计	讲授	实验	上机	实践			
通识教育	思政类课程	2092099	道德与法律 Ideological Morality and Rule of Law	1.0	16	16				16	1	
		2094199	中国概况（2-1） Survey of China (2-1)	3.0	48	48				48	3	
		2094299	中国概况（2-2） Survey of China (2-2)	3.0	48	48				48	4	
	基础素养课程	2091199	初级汉语口语（2-1） Primary oral Chinese (2-1)	4.0	64	64				64	1	
		2092199	初级汉语精读（2-1） Primary Chinese reading (2-1)	4.0	64	64				64	1	
		2091299	初级汉语口语（2-2） Primary oral Chinese (2-2)	4.0	64	64				64	2	
		2092299	初级汉语精读（2-2） Primary Chinese reading (2-2)	4.0	64	64				64	2	
		2095199	中级汉语（2-1） Intermediate Chinese (2-1)	4.0	64	64				64	3	
		2095299	中级汉语（2-2） Intermediate Chinese (2-2)	4.0	64	64				64	4	
		2096199	高级汉语（2-1） Advanced Chinese (2-1)	4.0	64	64				64	5	

课程类别	课程模块	课程编码	课程名称	学分	课内学时					课外学时	学期	备注
					合计	讲授	实验	上机	实践			
		2096299	高级汉语（2-2） Advanced Chinese (2-2)	4.0	64	64				64	6	
		0711299	程序设计 Programming	3.0	48	32		16		48	1	
		0711399	大学计算机 Fundamentals of Computer	1.0	24			24		24	2	
	通识选修课程	至少修读10学分通识教育选修课程，其中通识教育核心课程不少于4学分（应分布于不同模块，且全球视野与思维表达模块不少于2学分）；非艺术类学生修读艺术类课程不少于2个学分。		≥10							1-8	
专业教育	学科基础课程	0911199	高等数学（2-1） Advanced Mathematics (2-1)	6.0	96	96				96	1	
		0960199	大学化学 College Chemistry	4.0	64	54	10			64	1	
		0911299	高等数学（2-2） Advanced Mathematics (2-2)	6.0	96	96				96	2	
		0910399	线性代数 Linear Algebra	3.0	48	48				48	2	
		0611999	土木工程概论 Introduction to Civil Engineering	2.0	32	32				32	2	
		0699199	认识实习 Understanding Practice	1.0	1周				1周		S1	
		0931199	大学物理（2-1） University Physics (2-1)	4.0	64	64				64	3	
		0941199	大学物理实验（2-1） College Physics Experiment (2-1)	1.0	24	4	20			24	3	
			理论力学 Theoretical Mechanics	3.0	48	48				48	3	
		0610699	画法几何与工程制图 Descriptive Geometry and Engineering Drawing	5.0	64+1周	64		0	1周	64	3	
		0931299	大学物理（2-2） University Physics (2-2)	3.5	56	56				56	4	
		0941299	大学物理实验（2-2） College Physics Experiment (2-2)	1.0	24		24			24	4	
			材料力学 Mechanics of Materials	4.0	64	60	4			64	4	
		0610799	土木工程材料 Civil Engineering Materials	3.5	60	48	12			60	4	
		0611799	工程地质与水文地质 Engineering Geology and Hydrogeology	2.0	32	32				32	4	
		0691399	房建设计与BIM实践 Building Design and BIM Practice	3.0	56	32		24		40	4	
		0693099	工程地质与水文地质实习 Practice of Engineering Geology and Hydrogeology	2	2周				2周		S2	

课程类别	课程模块	课程编码	课程名称	学分	课内学时					课外学时	学期	备注
					合计	讲授	实验	上机	实践			
	专业必修课程		结构力学 Structural Mechanics	4.0	64	64				64	5	
		0610899	混凝土结构 Concrete Structure	4.0	64	64				64	5	
		0692899	混凝土结构课程设计 Course Design of Concrete Structure	2.0	2周				2周		5	
		0614199	土力学 Soil Mechanics	3.0	52	40	12			40	5	
		0695399	基础工程 Foundation Engineering	2.5	24+1周	24			1周	24	5	
		0611299	钢结构 Steel Structure	5.0	80	80				80	6	
		0611099	多层与高层建筑结构设计 Multi-storey and High-rise Building Structure Design	4.0	64	64				64	6	
		0611899	建筑设计信息及技术 Information Technology in Architectural Design	4.0	64	32		32		64	6	
		0610999	土木工程施工 Civil Engineering Construction	4.0	64	64				64	6	
		0615999	工程经济与项目管理 Engineering Economics & Project Management	2.0	32	32				32	6	
			地基处理与加固 Foundation Treatment and Reinforcement	2.0	32	32				32	6	
			施工组织实训 Construction Organization Training	1.0	1周				1周		6	
		0699299	生产实习 Production Practice	4.0	4周				4周		S3	
		0132499	工程测量学 Engineering surveying	2.0	32	32				32	7	
			隧道工程 Tunnel Engineering	2.0	32	32				32	7	
		0612099	结构抗震 Structural Seismic	4.0	64	64				64	7	
		0641699	有限元软件及应用 The Finite Element Software and Applications	1.5	24	12		12		24	7	
		0614799	防灾减灾工程概论 Introduction to Disaster Prevention and Mitigation Engineering	2.0	32	32				32	7	
			基坑工程 Foundation Pit Engineering	2.0	32	32				32	7	
			工程测量实习 Engineering Survey Practice	1.0	1周				1周		7	
			绿色低碳建筑及评估 Green Low-Carbon Buildings	2.0	32	32				32	7	

课程类别	课程模块	课程编码	课程名称	学分	课内学时					课外学时	学期	备注
					合计	讲授	实验	上机	实践			
		0695499	行业实践 Industry Practice	2.0	2 周				2 周		8	
		0699999	毕业设计 Graduation Design	16.0	16 周				16 周		8	
自主发展	跨学科课程	跨学科课程需要修读学分至少 3 学分，可以选修培养方案所列出的本专业所属专业类以外的专业开设的专业教育课程，也可通过修读微专业、辅修等途径替代。		≥3							3-8	

七、课程体系拓扑图



Undergraduate Training Program for International Students in Civil Engineering

(Major Code: 081001 Length of Study: 4 Years Degree Awarded: Bachelor of Engineering)

I. Educational Objectives

This program aims to cultivate senior civil engineers and high-caliber management talents who meet the development needs of modern civil engineering. Graduates will have received fundamental training for civil engineers, developed a certain international perspective in the discipline, and be capable of applying and advancing the knowledge, skills, and methods of civil engineering in practical environments across multiple countries, have an understanding of China and goodwill towards it, with preliminary competence in international exchanges and cooperation. Upon graduation, they will be qualified to engage in work related to civil engineering surveying, design, construction, management, and education.

II. Graduation Requirements and Achievement Matrix

Graduates shall acquire the following knowledge and capabilities:

1.Language Requirements: Students must pass the HSK Level 4 prior to graduation and possess basic Chinese listening, speaking, reading and writing skills, so as to meet the language requirements for their study, daily life and future career development in China. Students are required to complete the designated courses listed below and obtain passing grades: Survey of China (2-1), Survey of China (2-2), Elementary Chinese, Intermediate Chinese, Advanced Chinese.

2.Engineering Knowledge: Be able to apply mathematics, natural sciences, basic engineering theories and specialized knowledge to solve complex engineering problems in the field of civil engineering.

3.Information Research Skills: Have a basic command of Chinese, and be capable of reading and comprehending Chinese technical documents of the major with the aid of tools. Possess fundamental communication and teamwork skills in cross-cultural contexts, and adapt to multicultural working environments.

4.Problem Analysis Capability: Be able to identify and formulate complex civil engineering problems based on basic principles of mathematics, natural sciences and engineering sciences, conduct analysis through literature research, and draw valid conclusions.

5. Design/Development of Solutions: Capable of designing solutions for complex civil engineering problems, and developing systems, structures, components (joints) or construction schemes that meet specific professional requirements. Demonstrate innovative thinking in the design process, and take into account social, health, safety, legal, cultural and environmental factors.

6. Research: Able to conduct research on complex civil engineering problems by applying disciplinary principles and scientific methodologies. This includes designing experiments, collecting, processing, analyzing and interpreting data, and drawing reasonable and valid conclusions through information synthesis.

7. Utilization of Modern Tools: Capable of developing, selecting and applying appropriate technologies, resources, modern engineering and information technology tools to address complex engineering problems, including prediction and simulation. Also able to recognize the limitations of relevant tools.

8. Engineering and Society: Based on relevant background knowledge and industry standards of civil engineering, evaluate schemes for the design, construction and operation of civil engineering projects as well as solutions to complex engineering problems. Assess their impacts on society, health, safety, law and culture, and understand the responsibilities of civil engineers.

9. Environment and Sustainable Development: Able to understand and evaluate the impacts of engineering practices addressing complex civil engineering problems on the environment and social sustainable development.

10. Professional Ethics: Possess humanistic and social science literacy as well as a strong sense of social responsibility. Understand and abide by engineering professional ethics and codes of conduct in engineering practices, and be committed to taking responsibilities, contributing to the country and serving the society.

11. Individual and Teamwork: When tackling complex civil engineering problems, able to act as an individual contributor, team member or team leader within multidisciplinary teams.

12. Communication: Able to communicate effectively with peers and the general public on complex civil engineering issues, including compiling reports and design documents, delivering presentations, as well as giving and responding to instructions. Possess a global vision and the competence to communicate in cross-cultural settings.

13. Project Management: Understand, master and apply engineering management principles and economic decision-making methods in multidisciplinary contexts related to civil engineering, and acquire basic skills in organization, management and leadership.

14. Lifelong Learning: Foster the awareness of self-directed and lifelong learning, and develop the ability to continuously improve oneself and keep pace with new developments in civil engineering.

Graduation Requirement indicators and Achievement Matrix

Graduation Requirements	Performance Indicators	Courses
1. Engineering Knowledge Apply knowledge of mathematics, natural sciences, basic engineering and specialized disciplines to solve complex engineering problems in civil engineering.	1.1 Master knowledge of mathematics and natural sciences, and be capable of expressing civil engineering problems using the methodologies and terminology of mathematics, natural sciences and engineering sciences.	Advanced Mathematics Linear Algebra College Chemistry University Physics College Physics Experiment
	1.2 Grasp mechanical principles and methods, and be able to establish appropriate mathematical or mechanical models for specific engineering objects in civil engineering and conduct relevant calculations.	Mechanics of Materials Structural Mechanics Theoretical Mechanics Soil Mechanics
	1.3Master relevant basic engineering knowledge, and be able to deduce and analyze complex civil engineering problems by applying relevant theories and mathematical model approaches.	Engineering Geology and Hydrogeology Steel Structure Concrete Structure Multi-storey and High-rise Building Structure Design Foundation Engineering Foundation Pit Engineering Foundation Treatment and Reinforcement
	1.4 Apply systematic thinking and engineering knowledge to compare and synthesize solutions for complex civil engineering problems, and incorporate advanced technologies in the professional field.	Graduation Design Structural Seismic Civil Engineering Construction
2. Language Competence Have a basic command of Chinese, and be	2.1 Have basic Chinese language ability and be able to read and understand professional Chinese materials with the help of tools	Primary oral Chinese Primary Chinese reading Intermediate Chinese

Graduation Requirements	Performance Indicators	Courses
able to read and understand Chinese technical documents of the discipline with auxiliary tools. Possess fundamental communication and collaboration skills for cross-cultural scenarios, and adapt to multicultural working environments.		Advanced Chinese Survey of China
	2.2 Capable of basic communication and collaboration in cross-cultural environments.	Graduation Design Understanding Practice
3. Problem analysis: Can apply the basic principles of mathematics, natural science and engineering science, identify, express, and analyze complex engineering problems in civil engineering through literature research to obtain effective conclusions	3.1 Able to apply basic principles of mathematics and natural sciences to accurately identify and determine the key links of complex civil engineering problems.	College Chemistry University Physics College Physics Experiment Advanced Mathematics Linear Algebra
	3.2 Able to apply fundamental mechanical knowledge and methods to accurately identify and formulate complex civil engineering problems, and select appropriate approaches for analysis and solution.	Mechanics of Materials Structural Mechanics Theoretical Mechanics Soil Mechanics
	3.3 Can recognize that there are multiple solutions to solve problems, can apply professional knowledge, and seek alternative solutions to complex engineering problems by consulting industry standards and literature materials	Steel Structure Concrete Structure Foundation Engineering
	3.4 Can apply basic principles, use literature research, and analyze the influencing factors in the engineering activity process from the perspective of sustainable development to obtain effective conclusions	Graduation Design
4.Design/develop solutions: Can design (develop) solutions for complex civil engineering problems, design (develop) systems, structures, components (nodes) or construction plans that meet specific civil engineering needs, and can reflect innovative awareness in the design link, and consider factors such as society, health, safety, law, culture and environment	4.1 Master the basic design methods and technologies for the entire life cycle and process of civil engineering, be able to determine the design goals of engineering basic units or problem solutions according to specific needs, and complete design (development) work	Building Design and BIM Practice Information Technology in Architectural Design Steel Structure Concrete Structure Multi-storey and High-rise Building Structure Design Foundation Engineering Foundation Pit Engineering Foundation Treatment and Reinforcement
	4.2 Able to perform systematic analysis and optimization design of engineering systems, and demonstrate innovative thinking	Graduation Design Course Design of Concrete Structure
	4.3Able to carry out systematic analysis and optimization design of construction plans, process flows, etc., and demonstrate innovative thinking	Production Practice Construction Organization Training Civil Engineering Construction
	4.4 In design, it is possible to consider constraints such as public health and safety, energy saving and emission reduction, environmental protection, law and ethics, as well as social and cultural factors.	Graduation Design Course Design of Concrete Structure Construction Organization Training
5. Research: Able to conduct research on complex civil engineering problems based on the principles of civil engineering science and	5.1 Can be able to investigate and analyze solutions to complex engineering problems according to scientific principles through literature research or	Mechanics of Materials College Physics Experiment

Graduation Requirements	Performance Indicators	Courses
using scientific methods, including designing experiments, collecting, processing, analyzing, and interpreting data, and obtaining reasonable and effective conclusions through the synthesis of information	related methods, and can reasonably select research routes and scientifically design experimental schemes according to object characteristics	
	5.2 Able to construct experimental systems according to experimental protocols, conduct experiments safely, correctly collect experimental data, analyze and interpret experimental results, and obtain reasonable and effective conclusions through information synthesis.	Mechanics of Materials College Chemistry College Physics Experiment
6. Use modern tools: Be able to develop, select, and use appropriate techniques, resources, modern engineering tools, and information technology tools for complex engineering problems, including forecasting and simulating complex engineering problems, and be able to understand their limitations	6.1 Understand the principles and methods of using modern instruments, information technology tools, engineering tools, and simulation software commonly used in the civil engineering profession, and comprehend their scope of application and limitations.	Fundamentals of Computer College Physics Experiment Building Design and BIM Practice Descriptive Geometry and Engineering Drawing The Finite Element Software and Applications
	6.2 Able to select and use appropriate instruments, information resources, engineering tools, and professional simulation software to analyze, calculate, and design complex engineering problems	Engineering surveying Engineering Survey Practice Practice of Engineering Geology and Hydrogeology
	6.3 Able to creatively use modern tools for simulation and prediction for specific engineering problems through methods such as combination, selection and configuration, improvement, and secondary development, meeting specific needs, and capable of analyzing their limitations	Programming Building Design and BIM Practice The Finite Element Software and Applications Graduation Design
7. Engineering and Society: Based on relevant background knowledge and standards of civil engineering, evaluate the schemes for design, construction and operation of civil engineering projects as well as solutions to complex engineering problems. Assess their impacts on society, health, safety, law and culture, and recognize the responsibilities of civil engineers.	7.1 Understand the technical standards, intellectual property, industry policies, and laws and regulations related to the field of civil engineering, and comprehend the impact of different social cultures on engineering activities.	Introduction to Civil Engineering Introduction to Disaster Prevention and Mitigation Engineering Industry Practice Graduation Design
	7.2 Able to analyze and evaluate the impact of civil engineering professional engineering practices and solutions to complex engineering problems on society, health, safety, law, and culture, as well as the impact of these constraints on project implementation, and understand the responsibilities that civil engineers should bear	Understanding Practice Industry Practice Graduation Design Production Practice
8. Environment and Sustainable: Development Able to understand and evaluate the impacts of engineering practices for complex civil engineering problems on the environment and sustainable social development.	8.1 Able to recognize the importance of sustainable development in civil engineering-related activities, be aware of and understand the United Nations Sustainable Development Goals, and be aware of and understand the concepts and connotations of green low-carbon, environmental protection, and sustainable development.	Engineering Geology and Hydrogeology Introduction to Civil Engineering Introduction to Disaster Prevention and Mitigation Engineering Civil Engineering Materials Green Low-Carbon Buildings
	8.2 Able to think about the sustainability of civil engineering professional practice from the perspective of environmental protection and social	Building Design and BIM Practice Civil Engineering Materials Production Practice

Graduation Requirements	Performance Indicators	Courses
	sustainable development, evaluate the potential harm and risks it may pose to humans and the environment, and practice the concept of green environmental protection.	Green Low-Carbon Buildings
9.Professional Standards: Possess humanistic and social science literacy, a sense of social responsibility, and be able to understand and adhere to engineering professional ethics and codes of conduct in engineering practice, taking responsibility and serving society.	9.1 Understand the general situation of China, possess literacy in the humanities and social sciences and a sense of social responsibility, have correct outlooks on life, the world, and values, understand the relationship between the individual and society, and be able to consciously practice the core socialist values.	Survey of China Introduction to Civil Engineering
	9.2 Able to adhere to engineering ethics, understand and comply with engineering professional ethics and standards, respect the relevant national and internationally accepted laws and regulations, consciously fulfill the social responsibility of engineers for the safety, health, and well-being of the public in engineering practice, and understand the needs of an inclusive and diverse society.	Introduction to Civil Engineering Understanding Practice Graduation Design Production Practice
10. Individuals and Teams: When solving complex engineering problems in the civil engineering profession, being able to take on the role of an individual, team member, or leader in a multidisciplinary team.	10.1 Possesses a healthy physique and good interpersonal and teamwork skills, capable of effective and inclusive communication and collaboration with other team members in multidisciplinary, diverse, and various forms of teams (face-to-face, remote interaction), and able to work independently or collaboratively within the team.	Engineering Survey Practice Practice of Engineering Geology and Hydrogeology Understanding Practice Graduation Design
	10.2 Possesses certain organizational management and leadership abilities, capable of organizing, coordinating, and directing a team to carry out work	Graduation Design Production Practice
11. Communication: Able to effectively communicate and interact with industry peers and the public on complex civil engineering issues, including writing reports and design documents, giving presentations, expressing or responding to instructions. Possesses a certain international perspective and can communicate and interact in a cross-cultural context.	11.1 Able to communicate with industry peers and the public on complex civil engineering problems, including writing reports and design documents, giving presentations, and expressing or responding to instructions	Graduation Design Course Design of Concrete Structure Production Practice Construction Organization Training
	11.2 Possess a certain international perspective, understand international development trends and research hotspots in the professional field, understand and respect differences and diversity among cultures, have cross-cultural communication skills, and be able to conduct basic communication and interaction on professional issues in a cross-cultural context.	Survey of China Understanding Practice
12. Project Management: Understanding, mastering, and applying engineering management principles and economic decision-making methods in a multidisciplinary environment related to	12.1 Able to recognize the importance of management and economic decision-making in engineering projects, and master the methods of management and economic decision-making involved in engineering projects.	Construction Organization Training Civil Engineering Construction Engineering Economics & Project Management

Graduation Requirements	Performance Indicators	Courses
civil engineering, with certain organizational, management, and leadership abilities.	12.2 Understand the cost composition of the entire project lifecycle and all processes, comprehend the management and economic decision-making issues involved, be able to apply engineering management principles and economic decision-making methods in design, construction, and management within a multidisciplinary environment, and possess certain engineering project management capabilities.	Construction Organization Training Civil Engineering Construction Engineering Economics & Project Management
13. Lifelong learning: Having the awareness of self-directed learning and lifelong learning, and the ability to improve self-directed learning and adapt to new developments in civil engineering	13.1 Able to recognize the necessity of autonomous and lifelong learning, with an awareness of tracking the development trends of the civil engineering industry	Industry Practice Graduation Design
	13.2 Possesses the ability for independent learning, including the ability to understand technical problems, the ability to summarize and generalize, and the ability to raise questions, and continuously updates and expands knowledge to meet the needs of social and civil engineering industry development.	Structural Mechanics Graduation Design Production Practice

III. Courses Main Disciplines and Core Courses

Major Discipline: Civil Engineering

Core Courses: Theoretical Mechanics, Civil Engineering Materials, Mechanics of Materials, Structural Mechanics, Soil Mechanics, Foundation Engineering, Concrete Structures, Steel Structures, Multi-story and High-rise Building Structural Design, Civil Engineering Construction, Structural Seismic Resistance

IV. Specialized Courses

1. Professionally Featured Courses

- Integration of Specialization and Innovation Courses: Building Design and BIM Practice, Concrete Structures
- Project-Based Courses: Construction Organization Training, Course Design of Concrete Structure
- "Artificial Intelligence" Course: Information Technology in Architectural Design
- Industry-Education Integrated Class: Industry Practice, Production Practice

2. Local Internationalized Curriculum

- All-English Courses: Except for Chinese language courses and courses on an overview of China, professional courses are generally taught in English. Representative courses

include Theoretical Mechanics, Civil Engineering Materials, Mechanics of Materials, Structural Mechanics, Soil Mechanics, Foundation Engineering, Concrete Structures, Steel Structures, etc.

- Bilingual Courses: Primary oral Chinese, Primary Chinese reading, Intermediate Chinese, Advanced Chinese, Survey of China.

3. Other Courses

- Model Courses for Ideological and Political Education: Ideological Morality and Rule of Law, Survey of China, Introduction to Civil Engineering, Structural Seismic, Understanding Practice
- Practical Labor Education Courses: Practice of Engineering Geology and Hydrogeology, Engineering Survey Practice, Production Practice

V. Credit Requirements

Students in this major must complete a total of 187 credits as required by the professional training program within the school-prescribed period of study, and earn 5 credits from extracurricular courses, as well as meet the university student physical health standards, in order to graduate; those who meet the requirements for the awarding of a bachelor's degree will be granted a bachelor's degree.

Type of Degree Awarded: Bachelor of Engineering.

Course Category		Credits	Percentage	Theoretical Hours	Practical Hours	Total Hours
General Education Courses	General Required Courses	43	23.12%	656	40	696
	General Elective Courses	10	5.38%			
Major Foundation Courses	Discipline Foundation Courses	54	29.03%	734	94 hours + 4 weeks	828 hours + 4 weeks
	Major Required Courses	76	40.86%	700	56 hours + 27 weeks	756 hours + 27 weeks
	Major Elective Courses	—	—			
Independent Development	Interdisciplinary Courses	3	1.61%			
	Auxiliary Training Plan	10	—			
Total Graduation Credits (Total Hours)		186				
Practical Teaching (including in-class experiments)		61.5	33.06%	——	190 hours + 27 weeks	190 hours + 27 weeks
Intensive Practical Teaching Components		35.5	19.09%	——	27 weeks	27 weeks

Recommended Credits by Semester	Category	1	2	S1	3	4	S2	5	6	S3	7	8
	Required Courses	22	20	1	20	24	2	19.5	26	4	16.5	18
	General Electives	0	0	0	0	0	0	0	4	0	6	0
	Major Electives	0	0	0	0	0	0	0	0	0	0	0
	Auxiliary Training Plan	0	0	0	0	0	0	0	0	0	3	0
	Subtotal	22	20	1	20	24	2	19.5	30	4	26.5	18

VI. Curriculum Structure

Cource Category	Module	Code	Name	Credits	In-class Hours					Extra curricular Hours	Semester	Note
					Total	Lecture	Experiment	Computer lab	Practice			
General Education Courses	Ideological and Political Courses	2092099	道德与法律 Ideological Morality and Rule of Law	1.0	16	16				16	1	
		2094199	中国概况（2-1） Survey of China (2-1)	3.0	48	48				48	3	
		2094299	中国概况（2-2） Survey of China (2-2)	3.0	48	48				48	4	
	Basic Literacy Courses	2091199	初级汉语口语（2-1） Primary oral Chinese (2-1)	4.0	64	64				64	1	
		2092199	初级汉语精读（2-1） Primary Chinese reading (2-1)	4.0	64	64				64	1	
		2091299	初级汉语口语（2-2） Primary oral Chinese (2-2)	4.0	64	64				64	2	
		2092299	初级汉语精读（2-2） Primary Chinese reading (2-2)	4.0	64	64				64	2	
		2095199	中级汉语（2-1） Intermediate Chinese (2-1)	4.0	64	64				64	3	
		2095299	中级汉语（2-2） Intermediate Chinese (2-2)	4.0	64	64				64	4	
		2096199	高级汉语（2-1） Advanced Chinese (2-1)	4.0	64	64				64	5	
		2096299	高级汉语（2-2） Advanced Chinese (2-2)	4.0	64	64				64	6	
		0711299	程序设计 Programming	3.0	48	32		16		48	1	
		0711399	大学计算机 Fundamentals of Computer	1.0	24			24		24	2	
Professional Education	Discipline Foundation Courses	0911199	高等数学（2-1） Advanced Mathematics (2-1)	6.0	96	96				96	1	
		0960199	大学化学 College Chemistry	4.0	64	54	10			64	1	
		0911299	高等数学（2-2） Advanced Mathematics (2-2)	6.0	96	96				96	2	
		0910399	线性代数 Linear Algebra	3.0	48	48				48	2	

Cource Category	Module	Code	Name	Credits	In-class Hours					Extra curricular Hours	Semester	Note
					Total	Lecture	Experiment	Computer lab	Practice			
		0611999	土木工程概论 Introduction to Civil Engineering	2.0	32	32				32	2	
		0699199	认识实习 Understanding Practice	1.0	1 周				1 周		S1	
		0931199	大学物理（2-1） University Physics (2-1)	4.0	64	64				64	3	
		0941199	大学物理实验（2-1） College Physics Experiment (2-1)	1.0	24	4	20			24	3	
			理论力学 Theoretical Mechanics	3.0	48	48				48	3	
		0610699	画法几何与工程制图 Descriptive Geometry and Engineering Drawing	5.0	64+1 周	64		0	1 周	64	3	
		0931299	大学物理（2-2） University Physics (2-2)	3.5	56	56				56	4	
		0941299	大学物理实验（2-2） College Physics Experiment (2-2)	1.0	24		24			24	4	
			材料力学 Mechanics of Materials	4.0	64	60	4			64	4	
		0610799	土木工程材料 Civil Engineering Materials	3.5	60	48	12			60	4	
		0611799	工程地质与水文地质 Engineering Geology and Hydrogeology	2.0	32	32				32	4	
		0691399	房建设计与 BIM 实践 Building Design and BIM Practice	3.0	56	32		24		40	4	
		0693099	工程地质与水文地质实习 Practice of Engineering Geology and Hydrogeology	2	2 周				2 周		S2	
	Major Required Courses		结构力学 Structural Mechanics	4.0	64	64				64	5	
		0610899	混凝土结构 Concrete Structure	4.0	64	64				64	5	
		0692899	混凝土结构课程设计 Course Design of Concrete Structure	2.0	2 周				2 周		5	
		0614199	土力学	3.0	52	40	12			40	5	

Cource Category	Module	Code	Name	Credits	In-class Hours					Extra curricular Hours	Semester	Note
					Total	Lecture	Experiment	Computer lab	Practice			
			Soil Mechanics									
		0695399	基础工程 Foundation Engineering	2.5	24+1周	24			1周	24	5	
		0611299	钢结构 Steel Structure	5.0	80	80				80	6	
		0611099	多层与高层建筑结构设计 Multi-storey and High-rise Building Structure Design	4.0	64	64				64	6	
		0611899	建筑设计信息及技术 Information Technology in Architectural Design	4.0	64	32		32		64	6	
		0610999	土木工程施工 Civil Engineering Construction	4.0	64	64				64	6	
		0615999	工程经济与项目管理 Engineering Economics & Project Management	2.0	32	32				32	6	
			地基处理与加固 Foundation Treatment and Reinforcement	2.0	32	32				32	6	
			施工组织实训 Construction Organization Training	1.0	1周				1周		6	
		0699299	生产实习 Production Practice	4.0	4周				4周		S3	
		0132499	工程测量学 Engineering surveying	2.0	32	32				32	7	
			隧道工程 Tunnel Engineering	2.0	32	32				32	7	
		0612099	结构抗震 Structural Seismic	4.0	64	64				64	7	
		0641699	有限元软件及应用 The Finite Element Software and Applications	1.5	24	12		12		24	7	
		0614799	防灾减灾工程概论 Introduction to Disaster Prevention and Mitigation Engineering	2.0	32	32				32	7	
			基坑工程 Foundation Pit Engineering	2.0	32	32				32	7	

Cource Category	Module	Code	Name	Credits	In-class Hours					Extra curricular Hours	Semester	Note
					Total	Lecture	Experiment	Computer lab	Practice			
			工程测量实习 Engineering Survey Practice	1.0	1周				1周		7	
			绿色低碳建筑及评估 Green Low-Carbon Buildings	2.0	32	32				32	7	
		0695499	行业实践 Industry Practice	2.0	2周				2周		8	
		0699999	毕业设计 Graduation Design	16.0	16周				16周		8	
Independent Development	跨学科课程 Interdisciplinary Curriculum			≥3							3-8	