

# 浙江科技学院土木工程专业培养方案

## 一、培养目标

旨在培养具备土木工程师所需的专业知识和实践能力，具备良好的沟通协调和团队合作能力，具有良好的人文素质、职业道德和社会责任感，具有创新性思维和终身学习能力，主要面向浙江省的应用型土木工程专门人才。毕业生经过5年左右的实际工作锻炼后，能够解决土木工程领域的复杂工程问题，并自觉考虑安全、健康、环境、法律、可持续发展等因素，能够适应行业发展，成为土木工程勘察、设计、施工、监理、咨询等部门的技术或管理骨干。

本培养目标可归纳为以下几个基本要点：

- 目标1：具有扎实的工程科学基础和宽广的土木工程专业知识；
- 目标2：具有较强的土木工程实践能力，能够使用现代工具分析、研究问题，设计、开发并评价解决方案；
- 目标3：具有良好的沟通协调和团队合作能力，具有良好的人文素质、职业道德和社会责任感；
- 目标4：具有终身学习能力和创新性思维，能够适应行业发展；
- 目标5：具有解决土木工程领域的复杂工程问题的能力，能够胜任从业领域的技术或管理工作。

## 二、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土木工程专业领域的复杂工程问题。
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土木工程专业领域的复杂工程问题，以获得有效结论。
3. 设计（开发）解决方案：能够设计（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，并在设计环节中考虑社会、健康、安全、法律、文化以及环境等因素。在提出复杂工程问题的解决方案时具有创新意识。
4. 研究：能够基于科学原理并采用科学方法对复杂土木工程问题进行研究，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并应用于工程实践。
5. 使用现代工具：能够针对复杂土木工程问题，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，包括对复杂土木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. 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. 职业规范：了解中国国情、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。
9. 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. 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 design 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. 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. 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。

## 三、毕业要求达成矩阵

毕业要求	指标点	相关教学活动	学生考核方式
	1.1 能够运用数学和自然科学基本知识描述土木工程专业的复杂工程问题。	高等数学A1-A2、线性代数B、概率论与数理统计B、大学物理C、普通化学B	课程平时考核； 期末考核
	1.2 能够运用工程基础和信息技术知识，针对土木工程专业的复杂工程问题选择合适的模型。	C语言程序设计、电子电工学B、结构力学1-2	课程平时考核； 期末考核

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。	1.3 能够运用专业知识对土木工程专业的复杂工程问题的模型进行推理分析，并获得有效的解。	混凝土结构基本原理、钢结构基本原理、土力学（双语）、基础工程、工程经济与项目管理	课程平时考核； 期末考核
	1.4 能够通过对土木工程专业的复杂工程问题模型解的分析，寻求对模型的改进。	基础工程课程设计、工程概预算课程设计、建筑工程方向课程设计（单层工业厂房设计、钢结构设计）/地下工程方向课程设计（基坑支护设计、地下建筑结构设计）、结构设计CAD（PKPM）	课程平时考核； 期末考核
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土木工程专业的复杂工程问题，以获得有效结论。	2.1 能够应用数学、自然科学和工程科学的基本原理，识别土木工程专业的复杂工程问题。	理论力学、材料力学、结构力学1-2、流体力学、工程地质	课程平时考核； 期末考核
	2.2 能够运用图表、图纸或文字等准确有效地表达土木工程专业的复杂工程问题。	画法几何与工程制图、建筑工程方向课（混凝土结构设计、建筑钢结构设计、砌体结构、高层建筑结构）/地下工程方向课（岩石力学、地下工程设计原理、隧道工程、地下工程施工）	课程平时考核； 期末考核
	2.3 能够运用文献、规范、标准和图集对土木工程专业的复杂工程问题进行分析，并获得有效的结论。	建筑工程方向课程设计（钢筋混凝土肋梁楼盖设计、单层工业厂房设计、钢结构设计）/地下工程方向课程设计（基坑支护设计、地下建筑结构设计、地下工程施工设计）、结构设计CAD(PKPM)	课程平时考核； 期末考核
3. 设计（开发）解决方案：能够设计（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，并在设计环节中考虑社会、健康、安全、法律、文化以及环境等因素。在提出复杂工程问题的解决方案时具有创新意识。	3.1 能够根据用户需求确定土木工程问题的设计目标及方案。	房屋建筑学、混凝土结构基本原理、钢结构基本原理、工程经济与项目管理、地震工程导论	课程平时考核； 期末考核
	3.2 掌握与土木工程相关的公众健康和环境、安全、法律等知识，并能用于方案的可行性研究中。	土木工程概论、工程建设法规、思想道德修养与法律基础、形势与政策、环境保护概论、生物工程探秘	课程平时考核； 期末考核
	3.3 能够针对土木工程专业复杂工程问题，进行功能或单体设计，及结构、体系设计，呈现设计成果，并体现创新意识。	房屋建筑学课程设计、基础工程课程设计、建筑工程方向课程设计（钢筋混凝土肋梁楼盖设计、单层工业厂房设计、钢结构设计）/地下工程方向课程设计（基坑支护设计、地下建筑结构设计、地下工程施工设计）	课程平时考核； 期末考核
4. 研究：能够基于科学原理、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并应用于工程实践。	4.1 能够对土木工程相关的各种物理现象、材料特性进行实验设计，并对实验数据进行处理、分析与解释。	大学物理实验B、普通化学实验B、材料力学实验、土木工程材料实验（双语）、土力学实验（双语）、结构实验	课程平时考核； 期末考核
	4.2 能够通过理论与实验研究，对土木工程问题的体系、结构、构件、节点进行分析。	混凝土结构基本原理、钢结构基本原理、基础工程、建筑工程方向课（混凝土结构设计、建筑钢结构设计）/地下工程方向课（地下工程设计原理、隧道工程）、结构实验	课程平时考核； 期末考核
	4.3 能够对土木工程专业的复杂工程问题的研究成果进行整合、获得有效结论，并应用于工程实践。	建筑工程方向课程设计（钢筋混凝土肋梁楼盖设计、单层工业厂房设计、钢结构设计）/地下工程方向课程设计（基坑支护设计、地下建筑结构设计、地下工程施工设计）、毕业设计（论文）	课程平时考核； 期末考核
	5.1 能够选择适当的计算机基础与土木工程专业软件等现代工具解决土木工程问题。	C语言程序设计、CAD基础、结构设计CAD（PKPM）	课程平时考核； 期末考核

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。	5.2 能够运用现代检测工具、实验工具、信息工具对土木工程问题进行检测、预测、模拟。	工程测量A、测量实习、结构实验、工程地质实习	课程平时考核； 期末考核
	5.3 能够开发、选择与使用恰当的技术、资源和信息技术工具，处理土木工程专业的复杂工程问题，并理解其局限性。	工程概预算课程设计、建筑工程方向课程设计（单层工业厂房设计、钢结构设计）/地下工程方向课程设计（基坑支护设计、地下建筑结构设计）、结构设计CAD(PKPM)、毕业设计（论文）	课程平时考核； 期末考核
6. 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。	6.1 能够理解土木工程师在工程实践及解决土木工程专业的复杂工程问题中应承担的责任。	大学始业教育、土木工程概论、工程建设法规、工程经济与项目管理	课程平时考核； 期末考核
	6.2 能够评价土木工程实践及复杂问题解决方案对社会、健康、安全、法律以及文化的影响。	工程经济与项目管理、土木工程施工课程设计、工程概预算课程设计、技术实习、毕业设计（论文）	课程平时考核； 期末考核
7. 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。	7.1 能够理解土木工程可持续性发展的重要性。	土木工程概论、环境保护概论、生物工程探秘、房屋建筑学、土木工程材料（双语）	课程平时考核； 期末考核
	7.2 能够评价土木工程专业复杂工程问题的工程实践对环境及社会可持续发展的影响。	土木工程施工、工程经济与项目管理、工程概预算、土木工程施工课程设计、工程概预算课程设计	课程平时考核； 期末考核
8. 职业规范：了解中国国情、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。	8.1 具有正确的世界观、人生观，身心健康。	马克思主义基本原理概论、思想道德修养与法律基础、毛泽东思想和中国特色社会主义理论体系概论、体育1-4、体质健康训练、军事理论及训练、大学生心理健康教育	课程平时考核； 期末考核
	8.2 具有良好的人文素质，了解国情，维护国家利益，具有推动民族复兴和社会进步的责任感。	大学语文、毛泽东思想与中国特色社会主义理论体系概论、中国近现代史纲要、形势与政策、思政社会实践	课程平时考核； 期末考核
	8.3 理解土木工程师的职业性质和责任，在工程实践中能自觉遵守职业道德和规范，具有法律意识。	工程建设法规、大学生职业发展与就业指导1-2、大学生职业发展与就业指导实践、技术实习	课程平时考核； 期末考核
9. 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。	9.1 能够在多学科背景下独立完成工作。	第二课堂、电工电子实习B、技术实习	课程平时考核； 期末考核
	9.2 能够以团队成员或负责人的角色开展工作，主动与其他学科的成员共享信息，倾听其他团队成员的意见，合作共事。	认识实习、建工实习、工程地质实习、技术实习	课程平时考核； 期末考核
10. 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	10.1 具备撰写土木工程项目报告和设计文稿的能力。	测量实习、认识实习、建工实习、工程地质实习、技术实习、毕业设计（论文）	课程平时考核； 期末考核

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。	10.2 针对土木工程专业的复杂工程问题,具备良好的陈述能力、沟通策略和交流能力,并具备倾听及回应意见的能力。	建工实习、技术实习、毕业设计(论文)	课程平时考核; 期末考核; 答辩[仅技术实习、毕业设计(论文)]
	10.3 具备良好的国际视野,能够在跨文化背景下就复杂土木工程问题进行沟通和交流。	大学英语2-3/大学英语3-4、 大学英语1-2、土木工程材料(双语)、 土力学(双语)、工程建设法规、 毕业设计(论文)	课程平时考核; 期末考核; 答辩[仅毕业设计(论文)]
11. 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。	11.1 理解土木工程项目中管理与经济决策的重要性,掌握工程项目的管理原理与经济决策方法。	土木工程概论、创业基础、 工程施工、工程经济与项目管理	课程平时考核; 期末考核
	11.2 能够在与土木工程专业相关的多学科环境中将工程管理原理、经济决策方法应用于管理土木工程项目。	土木工程施工、工程经济与项目管理、 工程概预算、土木工程施工课程 设计、工程概预算课程设计	课程平时考核; 期末考核
12. 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。	12.1 能够通过自主学习获取一定的技术理解力。	房屋建筑学、土木工程施工、 建筑工程方向课(混凝土结构设计)/ 地下工程方向课(地下工程施工)	课程平时考核; 期末考核
	12.2 能够通过自主学习获取一定的总结与综述能力。	建筑工程方向课程设计(单层工业 厂房设计)/地下工程方向课程 设计(地下建筑结构设计)、技术实 习、毕业设计(论文)	课程平时考核; 期末考核
	12.3 具有终身学习意识,能够提出问题并学习新的知识和技能,具有不断适应土木工程学科发展的能力。	建筑工程方向课程设计(钢结构 设计)/地下工程方向课程 设计(基坑支护设计)、毕业 设计(论文)	课程平时考核; 期末考核

#### 四、主干学科

力学、土木工程

#### 五、专业核心课程

画法几何与工程制图、理论力学、材料力学、结构力学、房屋建筑学、工程地质、土木工程材料、工程测量、混凝土结构基本原理及设计、钢结构基本原理及设计、土力学、基础工程、土木工程施工技术、工程经济与项目管理、工程建设法规、地震工程导论。

#### 六、主要实践环节

思政社会实践、工程地质实习、测量实习、建工实习、认识实习、技术实习、课程设计及实验、专业实验、专项设计、毕业设计(论文)。

#### 七、学制、学位及毕业学分要求

1. 学制:实行弹性学制,本科基本学制一般为4年,可提前1年毕业,最长不超过8年。
2. 授予学位:工学学士学位。
3. 本专业毕业最低学分要求:180。

#### 八、学分结构要求

课程设置及修读类型			学分及占比	
			学分	学分比例
理论教学环节	通识教育课	必修	52	28.9%
		选修	8	4.4%
	学科专业类基础课	必修	20	11.1%
	专业核心课(必修)		27.5	15.3%

	拓展复合课（选修）	9.5	5.3%
	小计	117	65.0%
实践教学环节	必修	63	35.0%
	合计	180	100.0%

# Undergraduates Program in Civil Engineering

## I. Educational Objectives

The educational objectives of the Civil Engineering Program is to produce graduates who will possess knowledge and practical skills that civil engineers need, graduates who will communicate effectively in civil engineering activities and function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings, graduates who will pursue ideas in humanities and arts, and commit to professional ethics and social responsibilities, and graduates who will have the ability of engaging in life-long learning, creative thinking, and graduates who will become application-oriented civil engineering professionals employed mainly in Zhejiang Province. Graduates with real-world professional experience are expected to attain the following objectives within about 5 years of graduation: Solve complex engineering problems in civil engineering considering consciously factors such as safety, health, environment, law and sustainability; follow closely civil engineering professional development; become key technical or management staff in geotechnical survey, design, construction, supervision, consultation sectors in civil engineering related area.

The program educational objectives can be summarized as the following main points, i.e., graduates within about 5 years of graduation will:

Objective 1: Possess solid knowledge in sciences and engineering fundamentals and broad knowledge in engineering specialization;

Objective 2: Develop strong practical skills in civil engineering area to analyze and investigate problems, and to design, develop and evaluate solutions using modern tools;

Objective 3: Communicate effectively in civil engineering activities and function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings, pursuing ideas in humanities and arts, and committing to professional ethics and social responsibilities;

Objective 4: Develop the ability of engaging in life-long learning, creative thinking and follow closely civil engineering professional development;

Objective 5: Solve complex engineering problems in civil engineering and be competent at technical or management work in relevant area.

## II. Graduation Requirements

1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems in civil engineering community.

2. Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems in civil engineering reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

3. Design/Development of Solutions: Design solutions for civil engineering problems and design systems, structures, elements, joints, nodes or construction schemes that meet specified needs with creative thinking and appropriate consideration for public health and safety, societal, cultural, legal and environmental considerations.

4. Investigation: Conduct investigations of complex engineering problems in civil engineering using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions and apply them in engineering practice.

5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, incl

6. The Engineer and Society: Apply reasoning informed by contextual knowledge and standards to assess societal, health, saf

7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of civil engineering prac

9. Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams and in multi-

10. Communication: Communicate effectively on complex engineering problems in civil engineering 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, and give and receive clear instructions; communicate well in the cross-cultural context from international perspective.

11. Project Management and Finance: Demonstrate knowledge and understanding of civil engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage civil engineering projects and in multidisciplinary environments.

12. Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of civil engineering technological change.

### III. Achievement Matrix of Graduation Requirements

Graduation Requirements	Indicators of Graduation Requirements	The Main Courses and Programs	Assessment
1. Engineering Knowledge: Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems in civil engineering community.	1.1 Apply knowledge of mathematics, natural science to the description of complex engineering problems in civil engineering community.	Advanced Mathematics Level A1-A2, Linear Algebra Level B, Probability Theory and Mathematical Statistics Level B, College Physics Level C, General Chemistry B	In-semester evaluation; Final evaluation
	1.2 Apply knowledge of engineering fundamentals and IT to the selection of a reasonable model of complex engineering problems in civil engineering.	C Programming, Electrical Engineering B, Structural Mechanics 1~2	In-semester evaluation; Final evaluation
	1.3 Apply knowledge of an engineering specialization to the reasoning analysis of the model of complex engineering problems in civil engineering and reach substantiated solution.	Principal Theory of Concrete Structure, Principal Theory of Steel Structure, Foundation Engineering, Engineering Economy and Project Management	In-semester evaluation; Final evaluation
	1.4 Analyze and improve appropriately the model solution of complex engineering problems in civil engineering.	Course Design of Foundation Engineering, Course Design of Civil Engineering Budget Estimate, Course Design of Architectural Engineering Direction(Design of Single-Storey Industrial Plan, Design of Steel Structure) / Course design of underground engineering Direction(Design of foundation pit support, Design of underground structure), Structural CAD (PKPM)	In-semester evaluation; Final evaluation
2. Problem Analysis: Identify, formulate, research literature and analyze complex engineering problems in civil engineering reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering	2.1 Identify reasonably complex engineering problems in civil engineering using first principles of mathematics, natural sciences and engineering sciences.	Theoretical Mechanics, Material Mechanics, Structural Mechanics 1~2, Fluid Mechanics, Engineering Geology	In-semester evaluation; Final evaluation
	2.2 Formulate accurately and effectively complex engineering problems in civil engineering using figures, tables, drawings and/or words.	Descriptive Geometry and Engineering Drawing, Principal Theory of Concrete Structure, Principal Theory of Steel Structure, Foundation Engineering, Civil Engineering Construction, Engineering Economy and Project Management, Structural Engineering Direction (Design of Concrete Structures, Design of Building Steel Structure, Masonry Structure, High-building Structure) / Underground engineering Direction (Rock Mechanics, Underground Engineering Design Principle, Tunnel Engineering, Underground Engineering Construction)	In-semester evaluation; Final evaluation

sciences.	2.3 Analyze complex engineering problems in civil engineering reaching substantiated conclusions using literature, codes, specifications, standards and atlas.	Course Design of Structural Engineering Direction (Design of Reinforced Concrete Rib Beam Floor, Design of Single-Storey Industrial Plant, Design of Steel Structure) / Course Design of Underground Engineering Direction (Design of foundation pit support, Design of underground structure, Design of Underground Engineering Construction)	In-semester evaluation; Final evaluation
3. Design/Development of Solutions: Design solutions for civil engineering problems and design systems, structures, elements, joints, nodes or construction schemes that meet specified needs with creative thinking and appropriate consideration for public health and safety, societal, cultural, legal and environmental considerations.	3.1 Design objectives and schemes of civil engineering problems in accordance with client's needs.	Building Architecture, Principal Theory of Concrete Structure, Principal Theory of Steel Structure, Engineering Economy and Project Management, An Introduction to Earthquake Engineering	In-semester evaluation; Final evaluation
	3.2 Apply knowledge such as public health and safety, environment and law to feasibility study of schemes.	Introduction to Civil Engineering, Code for Engineering Construction, Fundamentals of Morality and Law, Situation and Policy, Exploration of Biotechnology, Introduction of Environmental Protection	In-semester evaluation; Final evaluation
	3.3 Do single or functional design or design systems, structures of complex engineering problems in civil engineering and present the design solutions with creating thinking.	Course Design of Building Architecture, Course Design of Foundation Engineering, Course Design of Structural Engineering Direction (Design of Reinforced Concrete Rib Beam Floor, Design of Single-Storey Industrial Plant, Design of Steel Structure) / Course Design of Underground Engineering Direction (Design of foundation pit support, Design of underground structure, Design of Underground Engineering Construction)	In-semester evaluation; Final evaluation
4. Investigation: Conduct investigations of complex engineering problems in civil engineering using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions and apply them in engineering practice.	4.1 Conduct design of experiments of physical phenomena and material properties, and processing, analysis and interpretation of data in civil engineering.	Experiment of College Physics Level B, Experiment of Basic Chemistry B, Experiment of Material Mechanics, Experiment of Civil Engineering Material (Bilingual), Experiment of Soil Mechanics (Bilingual)	In-semester evaluation; Final evaluation
	4.2 Analyze systems, structures, elements, joints, nodes in civil engineering by means of theoretical and experimental investigation.	Principal Theory of Concrete Structure, Principal Theory of Steel Structure, Foundation Engineering, Structural Engineering Direction (Design of Concrete Structures, Design of Building Steel Structure) / Underground engineering Direction (Underground Engineering Design Principle, Tunnel Engineering), Structural Testing	In-semester evaluation; Final evaluation
	4.3 Synthesize investigation information of engineering problems in civil engineering to provide valid conclusions and apply them in engineering practice.	Course Design of Structural Engineering Direction (Design of Reinforced Concrete Rib Beam Floor, Design of Single-Storey Industrial Plant, Design of Steel Structure) / Course Design of Underground Engineering Direction (Design of foundation pit support, Design of underground structure, Design of Underground Engineering Construction), Graduate Project (Thesis)	In-semester evaluation; Final evaluation



5. Modern Tool Usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems in civil engineering, with an understanding of the limitations.	5.1 Select appropriate modern tools including computer fundamentals, special software in civil engineering to the solution of civil engineering problems.	C Programming, Computer Aided Drawing, Structural CAD (PKPM)	In-semester evaluation; Final evaluation
	5.2 Apply modern tools of test, experiment, IT to the test, prediction and modelling of complex civil engineering problems.	Engineering Survey A, Surveying Practice, Structural Testing, Engineering Survey Practice	In-semester evaluation; Final evaluation
	5.3 Create, select and apply appropriate techniques, resources, and modern engineering and IT tools to the solution of complex civil engineering problems, with an understanding of the limitations.	Course Design of Civil Engineering Budget Estimate, Course Design of Structural Engineering Direction (Design of Single-Storey Industrial Plant, Design of Steel Structure) / Course Design of Underground Engineering Direction (Design of foundation pit support, Design of underground structure), Structural CAD (PKPM), Graduate Project (Thesis)	In-semester evaluation; Final evaluation
6. The Engineer and Society: Apply reasoning informed by contextual knowledge and standards to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional civil engineering practice and solutions to complex engineering problems in civil engineering.	6.1 Comprehend the responsibilities of civil engineers relevant to professional civil engineering practice and solutions to complex civil engineering problems.	Induction of university life, Introduction to Civil Engineering, Code for Engineering Construction, Engineering Economy and Project Management	In-semester evaluation; Final evaluation
	6.2 Assess societal, health, safety, legal and cultural issues relevant to professional civil engineering practice and solutions to complex civil engineering problems.	Engineering Economy and Project Management, Course Design of Civil Engineering Construction, Course Design of Civil Engineering Budget Estimate, Technology Practice, Graduate Project (Thesis)	In-semester evaluation; Final evaluation
7. Environment and Sustainability: Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in civil engineering in societal and environmental contexts.	7.1 Comprehend the importance of sustainability in the solution of civil engineering problems.	An Introduction to Civil Engineering, Exploration of Biotechnology, Introduction Environmental Protection, Building Architecture, Material of Civil Engineering	In-semester evaluation; Final evaluation
	7.2 Evaluate the sustainability and impact of professional engineering work in the solution of complex civil engineering problems in societal and environmental contexts.	Civil Engineering Construction, Engineering Economy and Project Management, Civil Engineering Budget Estimate, Course Design of Civil Engineering Construction, Course Design of Civil Engineering Budget Estimate	In-semester evaluation; Final evaluation
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of civil engineering practice; pursue ideas in humanities, arts and social sciences; and understand realities of China and take social responsibilities	8.1 Stick to correct world and life view with sound physical and mental health.	Introduction to Fundamental Principles of Marxism, Fundamentals of Morality and Law, Introduction to Mao Zedong's Thought and Theoretical System of Socialism with Chinese Characteristics, Physical Education 1-4, Health Training, Military Theory and Training, Mental Health Education for College Students	In-semester evaluation; Final evaluation
	8.2 Pursue ideas in humanities and arts and understand realities of China with serving national interests taking social responsibilities to promote national revival and social progress.	College Chinese, Introduction to Mao Zedong's Thought and Theoretical System of Socialism with Chinese Characteristics, Outline of Contemporary Chinese History, Situation and Policy, Ideological Social Practice	In-semester evaluation; Final evaluation

social responsibilities.	8.3 Comprehend professional characteristics and responsibilities for civil engineers and commit to professional ethics and norms of civil engineering practice in legal context.	Code for Engineering Construction, Career Planning and Guidance for College Students 1-2, Practice of career planning and guidance for college students, Technology Practice	In-semester evaluation; Final evaluation
9. Individual and Team work: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings in the solution of complex engineering problems in civil engineering.	9.1 Function effectively as an individual in multi-disciplinary settings.	Extracurricular Teaching, Electrics and Electronic Practice B, Technology Practice	In-semester evaluation; Final evaluation
	9.2 Function effectively as a member or leader in diverse teams and in multi-disciplinary settings to share information with, consider ideas from, and cooperate with members in other disciplines.	Cognition Practice, Construction Practice, Engineering Survey Practice, Technology Practice	In-semester evaluation; Final evaluation
10. Communication: Communicate effectively on complex engineering problems in civil engineering 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, and give and receive clear instructions; communicate well in the cross-cultural context from international perspective.	10.1 Demonstrate the ability to write project reports and design documentation of civil engineering.	Surveying Practice, Cognition Practice, Construction Practice, Engineering Survey Practice, Technology Practice, Graduate Project (Thesis)	In-semester evaluation; Final evaluation
	10.2 Demonstrate the ability to present, communicate effectively on complex engineering activities in civil engineering, and give and receive clear instructions.	Construction Practice, Technology Practice, Graduate Project (Thesis)	In-semester evaluation; Final evaluation; Defense (Only for Technology Practice and Graduation Design (Thesis))
	10.3 Communicate well in the cross-cultural context from international perspective on complex civil engineering problems.	College English 2-3/College English 3-4, Engineer English 1-2, Material of Civil Engineering (bilingual), Soil Mechanics (bilingual), Code for Engineering Construction, Graduate Project (Thesis)	In-semester evaluation; Final evaluation; Defense (Only for Graduation Design (Thesis))
11. Project Management and Finance: Demonstrate knowledge and understanding of civil engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, to manage civil engineering projects and in multidisciplinary environments.	11.1 Comprehend the importance of and master civil engineering management principles and economic decision-making methods.	Introduction to Civil Engineering, Entrepreneurial Fundamental, Civil Engineering Construction, Engineering Economy and Project Management	In-semester evaluation; Final evaluation
	11.2 Apply engineering management principles and economic decision-making methods to manage civil engineering projects in multidisciplinary environments.	Civil Engineering Construction, Engineering Economy and Project Management, Civil Engineering Budget Estimate, Course Design of Civil Engineering Construction	In-semester evaluation; Final evaluation
	12.1 Develop the ability of technological understanding by independent learning.	Building Architecture, Civil Engineering Construction, Structural Engineering Direction (Design of Concrete Structures) / Underground engineering Direction (Underground Engineering Construction)	In-semester evaluation; Final evaluation

12. Lifelong Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of civil engineering technological change.	12.2 Develop the abilities of summary and review by independent learning.	Course Design of Structural Engineering Direction (Design of Single-Storey Industrial Plan) / Course Design of Underground Engineering Direction (Design of Underground Structure), Technology Practice, Graduate Project (Thesis)	In-semester evaluation; Final evaluation
	12.3 Recognize the need for life-long learning and develop the abilities of raising questions and acquiring new knowledge and skills to follow closely civil engineering professional development in the broadest context of civil engineering technological change.	Course Design of Structural Engineering Direction (Design of Steel Structure) / Course Design of Underground Engineering Direction (Design of Foundation Pit Support), Graduate Project (Thesis)	In-semester evaluation; Final evaluation

#### IV. Major Discipline:

Mechanics; Civil Engineering

#### V. Core Courses

Descriptive Geometry and Engineering Drawing, Theoretical Mechanics, Material Mechanics, Structural Mechanics, Building Architecture, Engineering Geology, Civil Engineering Materials, Engineering Surveying, Principal Theory and Design of Concrete Structure, Principal Theory and Design of Steel Structure, Soil Mechanics, Foundation Engineering, Civil Engineering Construction, Engineering Economy And Project Management, Code for Engineering Construction.

#### VI. Internship and Practice

Induction of University Life; Fundamental Experiments; Specialization Experiments; Special Design Course; Design Courses; Surveying Practice; Cognition Practice; Engineering Geology Practice; Construction Site Practice; Technology Practice; Graduation Design/Thesis

#### VII. Duration of Schooling, Degree and Credits Requirements for Graduation

1. Duration of Schooling: Generally 4 academic years, 3-8 academic years
2. Degree Conferred: Bachelor of Engineering
3. The Minimum Graduation Credits: 180

#### VIII. Credits Structure and Ratio:

The curriculum Provision and Course Type		Credits	Credits Ratios	
Theory Teaching	General Education Courses	Required	52	28.9%
		Optional	8	4.4%
	Discipline & Specialty Basic Courses	Required	20	11.1%
	Specialized Core Courses (Required)		27.5	15.3%
	Expand and Recombination Courses (Optional)		9.5	5.3%
	Subtotal		117	65.0%
Practice Teaching	Required		63	35.0%
Total		180	100.0%	







## 课程设置与学时安排（表一）

专业名称：土木工程

课程类别	课程性质	课程代码	课程名称	学分	总学时	教学安排				课外学时	考试学期	各学期周学时分配								备注	
						理论学时	实验学时	习题学时	研讨学时			第一学年		第二学年		第三学年		第四学年			
												长	长	长	长	长	长	长	长		
												1	2	3	4	5	6	7	8		
16周		16周		16周		16周		16周		16周		16周									
专业核心课	必修	0531A101	土木工程概论 Introduction to Civil Engineering	1	16	16					16		1							9-16周	
		0531A102	房屋建筑学 Building Architecture	2.5	40	36			4		48	3			2.5						
		0531A103~ 0531A104	结构力学1~2 Structural Mechanics 1~2	5.5	88	78			10		88	4~5			3	2.5					
		0531A105	混凝土结构基本原理 Principal Theory of Concrete Structure	3.5	56	52			4		56	5				3.5					
		0531A106	钢结构基本原理 Principal Theory of Steel Structure	2.5	40	32			6	2	40	5				2.5					
		0531A107	土力学(双语) Soil Mechanics (Bilingual)	2	32	28			4		32	5				2					
		0531A108	基础工程 Foundation Engineering	1.5	24	22			2		24	6					1.5				
		0531A109	土木工程施工 Civil Engineering Construction	3.5	56	48			5	3	56	5				3.5					
		0531A110	工程经济与项目管理 Engineering Economy and Project Management	2	32	28			4		32						2				
		0531A111	工程建设法规 Code for Engineering Construction	1	16	14				2	16						1				9-16周
		0531A112	工程概预算 Civil Engineering Budget Estimate	1.5	24	22			2		32						1.5				
		0531A113	地震工程导论 An Introduction to Earthquake Engineering	1	16	14				2	16						1				1-8周
专业核心课小计				27.5	440	390		41	9	456		1		2.5	3	14	7				
	方向	0541B101	混凝土结构设计 Design of Concrete Structures	3	48	46		1	1	48	6					3					

## 课程设置与学时安排（表一）

专业名称：土木工程

课程类别	课程性质	课程代码	课程名称	学分	总学时	教学安排				课外学时	考试学期	各学期周学时分配								备注		
						理论学时	实验实践	习题学时	研讨学时			第一学年		第二学年		第三学年		第四学年				
												长1	长2	长3	长4	长5	长6	长7	长8			
								16周	16周			16周	16周	16周	16周	16周	16周	16周	16周			
拓展复合课	专业拓展 (按方向选修)	1 (建筑工程)	0541B102	建筑钢结构设计 Design of Building Steel Structure	2	32	28	2	2		32	6						2				
			0541B103	砌体结构 Masonry Structure	1	16	14			2		16							1			
			0541B104	高层建筑结构 High-building Structure	2	32	30			2		32	7							2		
		小计(至少选修学分)				8	128	118	2	7		128							6	2		
	方向2 (地下工程)	0542B101	岩石力学 Rock Mechanics	2	32	30			2		32	6						2				
		0542B102	地下工程设计原理 Underground Engineering Design Principle	2.5	40	28	12				40	6						2.5				实验
		0542B103	隧道工程 Tunnel Engineering	1.5	24	22			2		24							1.5				
		0542B104	地下工程施工 Underground Engineering Construction	2	32	30			2		32	7							2			
	小计(至少选修学分)				8	128	110	12	6		128							6	2			
	专业复合课	3113A014	文献信息检索 Information Documents Retrieval	1	16	8	8								1							
		0545B101	工程结构鉴定与加固 Appraisal and Reinforce of Engineering Structure	1.5	24	24			2		24							1.5				
		0515B102	结构BIM BIM in Structural Engineering	1.5	24	12	12				24							1.5			上机	
		0545B103	房地产开发与管理 Development and Management of Real Estate	1.5	24	22			2		24							1.5				
		0542B423	高层建筑给排水及消防 High Rise Building Water Supply and Drainage and Fire Fighting	1.5	24	20			4		24							1.5				
		小计				7	112	86	20	8	0	96				1		6				
专业复合至少选修学分				1.5	24	24				24						1.5						
专业拓展复合至少选修学分				9.5	152	142	2	7		152						7.5	2					
理论教学学分学时合计				125.5	2088	1561	218	193	115	1609			26	23.5	24.5	23	16	16.5	2			





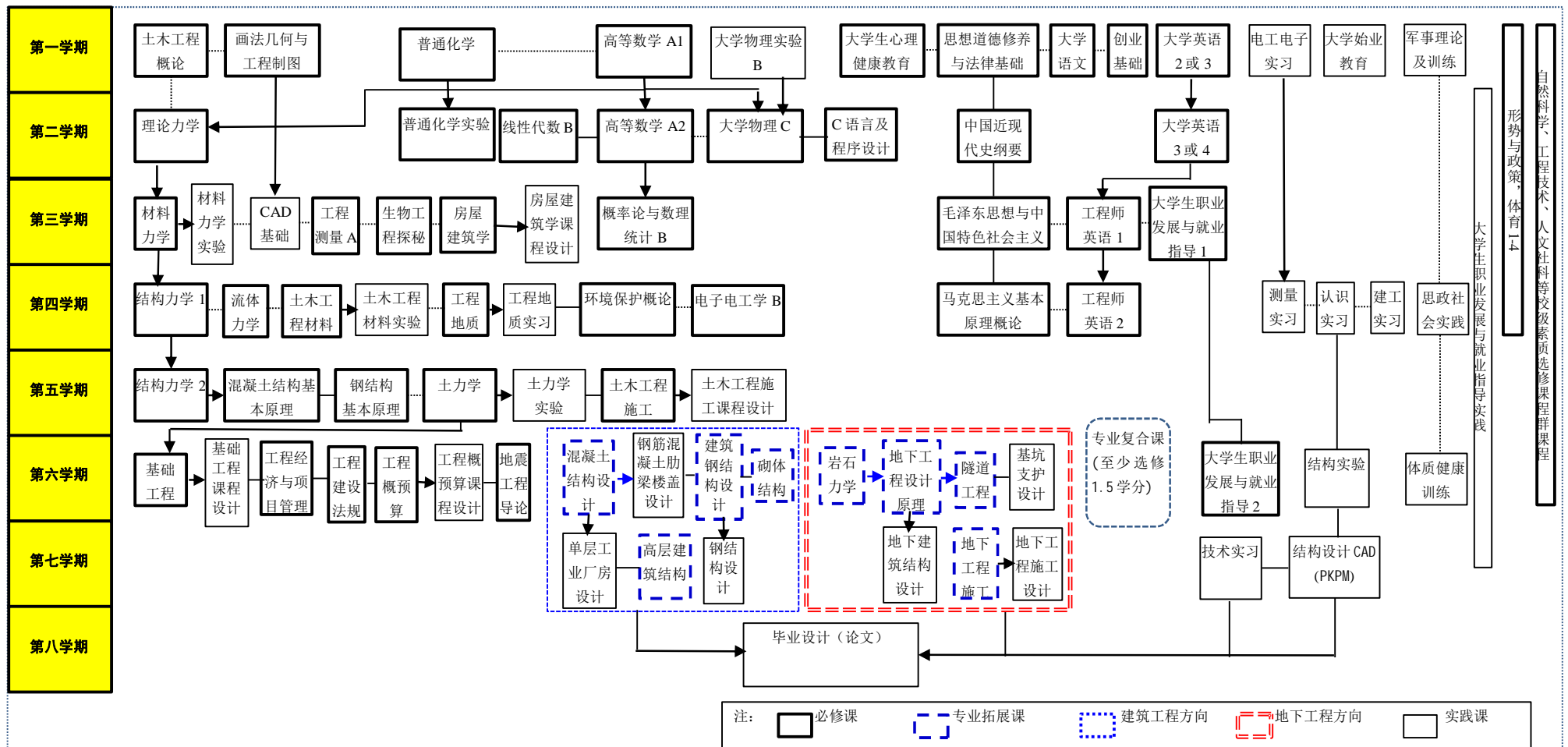
### 实践教学安排（表二）

课程代码	所属方向	实践教学活动名称	学分	周或学时	按学期分配（周或学时）												备注
					第一学年			第二学年			第三学年			第四学年			
					长1	长2	短1	长3	长4	短2	长5	长6	短3	长7	长8		
0554A101	课程设计	房屋建筑学课程设计 Course Design of Building Architecture	1	1周				1									
0554A102		土木工程施工课程设计 Course Design of Civil Engineering Construction	1	1周							1						
0554A103		基础工程课程设计 Course Design of Foundation Engineering	1	1周								1					
0554A104		工程概预算课程设计 Course Design of Civil Engineering Budget Estimate	1	1周								1					
0554B101	课程设计（续） （按方向选修，与理论环节课程一致）	钢筋混凝土肋梁楼盖设计 Design of Reinforced Concrete Rib Beam Floor	1	1周								1				方向1（建筑工程）	
0554B102		单层工业厂房设计 Design of Single-Storey Industrial Plant	2	2周									2				
0554B103		钢结构设计 Design of Steel Structure	1	1周										1			
0554B104		基坑支护设计 Design of Foundation Pit Support	2	2周								2			方向2（地下工程）		
0554B105		地下建筑结构设计 Design of Underground Structure	1	1周										1			
0554B106		地下工程施工设计 Design of Underground Engineering Construction	1	1周										1			
3752A020	基础实践	电工电子实习B Electrics and Electronic Practice B	1	32	32												
0551A103	综合实践	建工实习 Construction Practice	1	1周						1							
0561A105	专业实验	结构实验 Structural Testing	1	32									32			实验	

### 实践教学安排（表二）

课程代码	所属方向	实践教学活动名称	学分	周或学时	按学期分配（周或学时）												备注
					第一学年			第二学年			第三学年			第四学年			
					长1	长2	短1	长3	长4	短2	长5	长6	短3	长7	长8		
0561A106	专项设计	结构设计CAD(PKPM) Structural CAD (PKPM)	0.5	16											16		上机
0551A104	专业实践	认识实习 Cognition Practice	1	1周						1							
0553A101		技术实习 Technology Practice	10	10周											10		
0555A101		毕业设计（论文） Graduate Project (Thesis)	16	16周												16	含毕业实习两周
31462009	第二课堂 Extracurricular Teaching		3	3	3												
合计			54.5	58周													

注：第二课堂除了外语等级考试、计算机等级考试等学分外，还包括开放性实验、大学生科技竞赛、参加教师科研项目、各级大学生项目立项等创新学分。



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