

Civil Engineering Major Objective Matrix

Objective	Expected Learning Outcomes of the Curriculum (Knowledge/Skills/Abilities)	Corresponding modules
Master foundational knowledge in mathematics, natural sciences, and information technology to establish a solid foundation for subsequent coursework and apply this knowledge to solve engineering problems.	<p>Knowledge: Master the fundamentals of mathematics, natural sciences, information technology, and computer basics.</p> <p>Skills: Be able to apply mathematical and natural science language to formally present complex civil engineering problems.</p> <p>Abilities: Be able to observe, analyze, and solve technical problems using mathematical and informational viewpoints and methods of thinking. Based on the characteristics of mathematics and information technology, conduct continuous analysis, synthesis, computation, judgment, and reasoning on engineering phenomena, possessing the fundamental abilities to solve engineering problems.</p>	Mathematics and Physics Information Technology
Master the fundamental knowledge of civil engineering, apply the learned knowledge to identify and analyze complex civil engineering problems, and lay a solid foundation for further solving complex civil engineering problems.	<p>Knowledge: Master fundamental engineering knowledge such as engineering mechanics, engineering materials, as well as specialized knowledge in steel structures and concrete structures.</p> <p>Skills: Apply basic principles of engineering science to identify complex civil engineering problems, analyze these problems, and determine the key aspects for solving the issues.</p> <p>Abilities: Use engineering principles to analyze the influencing factors in the problem-solving process from multiple angles, effectively express the analysis process and conclusions, and use them to guide the formulation of solutions.</p>	Engineering Fundamentals Professional Foundation
Master professional knowledge in civil engineering, enabling the investigation, design, and analysis of complex engineering problems in related fields, and the development of solutions to meet the specific needs of complex civil engineering issues.	<p>Knowledge: Master specialized knowledge related to building, road and bridge, and rail engineering design, construction, management, and other aspects in civil engineering.</p> <p>Skills: Able to complete the design of structures and components (nodes) that meet specific civil engineering needs, and able to develop construction plans for specific complex engineering problems.</p> <p>Familiar with modern tools related to civil engineering, understanding their limitations, and possessing the ability to select and use appropriate tools.</p> <p>Abilities: In design and construction planning, able to fully consider constraints such as social, health, safety, legal, cultural, and environmental factors.</p> <p>Able to use modern tools to model and calculate complex civil engineering problems, and analyze the validity and limitations of the results.</p> <p>Master the operation of basic software required for the development of informatization in the construction industry, and possess the ability to build and apply information models.</p>	Professional Application Professional Practice
Possess awareness of autonomous learning and lifelong learning, with the ability to track the development trends in the related fields of the major and complete further self-development.	<p>Knowledge: Master methods for tracking and learning the latest developments and knowledge in the forefront and emerging fields of civil engineering.</p> <p>Skills: Recognize the importance of lifelong learning, actively track developments in the major and related fields, and possess the ability for self-directed learning.</p> <p>Abilities: Apply acquired professional knowledge widely, combining it with cutting-edge developments. Possess the ability to adapt to new developments in the civil engineering industry.</p>	Professional Development Integrated Application
Master cross-cultural and international cooperation and communication skills to adapt to social development and globalization.	<p>Knowledge: Master one foreign language.</p> <p>Skills: Read professional literature in English and perform mutual translation between Chinese and English.</p> <p>Abilities: Have a basic understanding of the international status of civil engineering disciplines and related industries, and possess initial communication and exchange abilities in a cross-cultural context.</p>	Foreign Language

Understand the current social model and social norms in China, demonstrate good social behavior, teamwork spirit, and humanistic care awareness. Develop comprehensively in moral, intellectual, physical, and psychological aspects.	<p>Knowledge: Master knowledge of modern Chinese history, basic principles of Marxism, military theory, etc., and engage in patriotism education, physical education, and military training.</p> <p>Skills: Understand social phenomena, stay informed about and adapt to social development, possess communication and collaboration abilities, demonstrate strong teamwork spirit, and promote physical and mental well-being and self-improvement.</p> <p>Abilities: Possess sound character and good psychological qualities. Understand China's national conditions, have humanistic and social science literacy, and social responsibility, enabling adherence to professional ethics and conduct in engineering practices, shouldering responsibilities, contributing to the nation, and serving society.</p>	Humanities and Social Sciences
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