MINISTRY OF EDUCATION & TRAINING
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY & EDUCATION

UNDERGRADUATE PROGRAM
Major of
CONSTRUCTION ENGINEERING TECHNOLOGY

(Issued under Decision No. 3744 /QĐ-ĐHSPKT dated 06 / 10 /2025 by the President of Ho Chi Minh City University of Technology and Education)

Education Program: Construction Engineering Technology
Level: Undergraduate
Major: Construction Engineering Technology
Major Code: 7510102A

Ho Chi Minh City, 2025

THE MINISTRY OF EDUCATION & TRAINING
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY & EDUCATION

SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

UNDERGRADUATE PROGRAM

Education Program: Construction Engineering Technology

Level: Undergraduate

Major: Construction Engineering Technology

Major Code: 7510102A

Type of Training: Full-time

Graduation Diploma: ENGINEER

(Issued under Decision No. 3744 /QĐ-ĐHSPKT dated 06 / 10 /2025 by the President of Ho Chi Minh City University of Technology and Education)

1. Duration of the Program: 4 years

2. Admission Requirements:

High school graduates (Vietnamese Upper Secondary Education Diploma or equivalent)

3. Grading Scale, Training Process, and Graduation Requirements

Grading system: 10-point

Training Process: In accordance with Decision No. 3116/QD-ĐHSPKT dated 22/08/2025, issued by the Ho Chi Minh City University of Technology and Education on the regulations of undergraduate training programs.

Graduation Requirements:

General Requirements: In accordance with Decision No. 3116/QD-ĐHSPKT dated 22/08/2025, issued by the Ho Chi Minh City University of Technology and Education on the regulations of undergraduate training programs.

Program-Specific Requirements: None

4. Program Objectives and Expected Learning Outcomes

Program Goals:

Graduates will develop comprehensively in terms of knowledge, skills, professional attitude, practical competence, and a strong sense of social responsibility. The program also aims to foster students' adaptability to dynamic and evolving working environments in the construction sector.

Program Objectives:

Upon graduation, students are expected to:

1. Master fundamental knowledge in science, engineering, and specialized areas of construction engineering technology.

2. Enhance their professional competency through the continuous development of technical and managerial skills, take on responsible roles in professional activities, and demonstrate lifelong learning capabilities.

3. Effectively adapt to professional environments, demonstrate leadership, and work collaboratively in modern construction settings.

Program Outcomes

Category	Expected Learning Outcomes	Competency Levels
1.	**Knowledge and Technical Reasoning**	
ELO-1	Demonstrate the ability to identify, present, and solve complex engineering problems by applying principles of science, engineering, and mathematics.	3
2.	**Skills and Personal/Professional Attributes**	
ELO-2	Analyze experimental results related to construction materials and structural engineering issues.	4
ELO-3	Develop self-directed learning plans to propose innovative solutions to construction-related problems.	5
ELO-4	Demonstrate appropriate professional ethics, discipline, and industrial working attitude.	5
3.	**Communication and Teamwork Skills**	
ELO-5	Organize team-based work by leveraging individual team member characteristics to achieve project goals.	4
ELO-6	Communicate effectively to meet the needs and characteristics of different audiences; apply foreign language skills in professional contexts.	4
4.	**Creativity in Ideation, Design, Implementation, and Operation in Enterprise, Social, and Environmental Contexts**	
ELO-7	Design part or whole of a construction project using accumulated knowledge and skills, while considering technical, economic, environmental, social, and sustainability factors.	5
ELO-8	Propose execution solutions for part or whole of a construction project, including implementation, organization, management, and supervision.	5
ELO-9	Select appropriate solutions for the operation of construction works such as supervision, maintenance, repair, or upgrading.	5

Competency Level Scale

Competency level (PL)		Description
$0.0 \leq PL \leq 1.0$	Basic	Memorising: Students are able to recall or recognize knowledge through actions such as defining, listing, identifying, naming, and describing.

1.0 < PL ≤ 2.0	Satisfactory	Understanding: Students can construct meaning from instructional materials through actions such as explaining, classifying, illustrating, interpreting, and inferring.
2.0 < PL ≤ 3.0		Applying: Students apply acquired knowledge to perform tasks or create products such as models, real-life objects, simulations, or reports.
3.0 < PL ≤ 4.0	Proficient	Analyzing: Students analyze materials or knowledge by breaking them into parts and identifying relationships through actions such as analyzing, categorizing, comparing, and synthesizing.
4.0 < PL ≤ 5.0		Evaluating: Students make judgments or predictions based on predefined criteria, standards, or indicators through actions such as evaluating, critiquing, commenting, and proposing.
5.0 < PL ≤ 6.0	Excellent	Creating: Students create new structures, models, or products by organizing and combining elements in innovative ways through actions such as designing, planning, generalizing, and conceptualizing.

5. Total Program Credit Requirement: 158 credits

(Excluding credits for Physical Education, and National Defense Education and Enterprise Seminar)

Foreign Language Knowledge:

- Students with an IELTS >= 4.5 or equivalent (as per Decisions No. 3239/QĐ-ĐHSPKT dated 03/09/2025) will be exempted from the English placement test. Their scores will be converted for English courses in the program and English proficiency requirement (Outcome).
- English Placement Test for Level Classification: Students without IELTS certificate must participate in an English placement test to determine their proficiency level.
    - If a student achieves Level 1, they will study Communicative English 1,2.
    - If a student achieves Level 2, they will study Academic English 1,2.
- Sequence of English courses: Communicative English 1,2 → Academic English 1, 2.

Note:

- Communicative English 1 and 2 are supplementary courses designed to enhance English communication skills for students not accumulating credits in the program.
- Academic English 1 and 2 are academic courses that accumulate credits in the program.

6. Allocation of credits

Groups of Courses	**Credits**		
	Total	**Compulsory**	**Elective**

Foundation science courses		**59**	**55**	**4**
Political theory + General law		14	14	0
Social sciences and humanities		4	0	4
English		8	8	0
Mathematics		12	12	0
Physics		7	7	0
Chemistry		3	3	0
Introduction to Construction Engineering Technology		3 (2+1)	3 (2+1)	0
Applied Programing in Construction		3 (2+1)	3 (2+1)	0
Others		5	5	0
1.	Applied Mathematics in Construction	3	3	0
2.	Construction Economy	2	2	0
Physical and National Defense Education		Non-accumulation		
Construction Engineering Courses		**99**	**91**	**8**
Fundamental Construction Engineering courses		34	34	0
Advanced Construction Engineering courses		37	29	8
Practices and laboratory		16	16	0
Internship		2	2	0
Graduation Thesis		10	10	0

7. Content of program

A – Required courses

7.1. Foundation science courses

No.	Course's ID	Course name	Credits	Note
1.	LLCT130105E	Philosophy of Marxism and Leninism	3	
2.	LLCT120205E	Political Economics of Marxism and Leninism	2	HT_(LLCT130105)
3.	LLCT120405E	Scientific Socialism	2	HT_(LLCT130105)
4.	LLCT120314E	Ho Chi Minh's Ideology	2	HT_(LLCT130105)

5.	LLCT220514E	History of Vietnamese Communist Party	2	HT_(LLCT120205) HT_(LLCT130105) HT_(LLCT120405) HT_(LLCT120314)
6.	GELA236939E	General Law	3	
7.	MATH132401E	Calculus 1	3	
8.	MATH132501E	Calculus 2	3	HT_(MATH132401)
9.	MATH132601E	Calculus 3	3	HT_(MATH132401) HT_(MATH132501)
10.	MATH132901E	Mathematical Statistics for Engineers	3	HT_(MATH132401)
11.	PHYS130902E	Physics 1	3	HT_(MATH132401)
12.	PHYS131002E	Physics 2	3	HT_(PHYS130902) HT_(MATH132401) HT_(MATH132501)
13.	PHYS111202E	Physics Lab 1	1	HT_(MATH132401) HT_(PHYS130902)
14.	GCHE130603E	General Chemistry for Engineers	3	
15.	ICET130117E	Introduction to Construction Engineering Technology	3(2+1)	
16.	APCO131621E	Applied Programing in Construction	3(2+1)	
17.	AMCO131421E	Applied Mathematics in Construction	3	HT_(MATH132501)
18.	COEC321119E	Construction Economy	2	

English			8	
15	ACEN340535E	Academic English 1	4	
16	ACEN340635E	Academic English 2	4	
National Defense Education (Giáo Dục Quốc Phòng)			**0 (4)**	**165 hours**
21	GDQP110131	Giáo dục quốc phòng 1 (*National Defence Education 1)*	0 (1)	45 hours
22	GDQP110231	Giáo dục quốc phòng 2 (*National Defence Education 2)*	0 (1)	30hours
23	GDQP110331	Giáo dục quốc phòng (*National Defence Education 3)*	0 (1)	30hours (14LT + 16TH)
24	GDQP110431	Giáo dục quốc phòng 4 (*National Defence Education 4)*	0 (1)	60hours (4LT +56TH)
Physical Education (Giáo Dục Thể Chất)			**0 (3)**	
25	PHED110130	Giáo dục thể chất 1 (*Physical Education 1)*	0 (1)	30hours (9LT + 21TH)
	Select 2 Courses			
26	FOOT112330	Bóng đá (*Football)*	0 (1)	30hours (9LT + 21TH)
27	VOLL112330	Bóng chuyền (*Volleyball)*	0 (1)	30hours (9LT + 21TH)
28	BASK112330	Bóng rổ (*Basketball)*	0 (1)	30hours (9LT + 21TH)
29	BADM112330	Cầu lông (*Badminton)*	0 (1)	30hours (9LT + 21TH)
30	TENN112330	Quần vợt (*Tennis)*	0 (1)	30hours (9LT + 21TH)
31	KARA112330	Không thủ đạo (*Karate)*	0 (1)	30hours (9LT + 21TH)
32	CHES112330	Cờ vua (*Chess)*	0 (1)	30hours (9LT + 21TH)
33	CHIN112330	Cờ tướng (Chinese Chess)	0 (1)	30hours (9LT + 21TH)

34	YOGA112330	Yoga (Yoga)	0 (1)	30hours (9LT + 21TH)
	PICK112330	Pickleball	1	(9LT + 21TH)
Total			**59**	

7.2. Construction Engineering courses

7.2.1. Fundamental Construction Engineering courses

No.	Course's ID	Course name	Credits	Note
1.	DGED125716E	Descriptive Geometry and Engineering Drawing	2	
2.	FUME130221E	Fundamentals of Mechanics	3	SS_(MATH132501E) SS_(PHYS130902E)
3.	STMA240121E	Strength of Materials	4	HT_(MATH132501E) TQ_(FUME130221E)
4.	SOME240118E	Soil Mechanics	4	
5.	STME240517E	Structural Mechanics	4	TQ_(FUME130221E) HT_(STMA240121E)
6.	RCST240617E	Reinforced Concrete Structures	4	TQ_(STMA240121E) HT_(COMA220717E)
7.	RCSP211017E	Reinforced Concrete Structures Project	1	HT_(RCST240617E) SS_(RCBS320817E)
8.	COMA220717E	Construction Materials	2	
9.	STST240917E	Steel Structures	4	TQ_(STMA240121E)
10.	WSSE221317E	Water Supply & Sewerage Engineering	2	
11.	FOEN330318E	Foundation Analysis and Design	3	HT_(SOME240118E) HT_(RCST240617E)
12.	FENP310418E	Foundation Engineering Project	1	TQ_(SOME240118E) HT_(RCST240617E) SS_(FOEN330318E)
Total			**34**	

7.2.2.a Advanced Construction Engineering Courses (Theoretical Courses)

No.	Course's ID	Course name	Credits	Note
1.	ARCH230216E	Principles of Architectural Design	3	HT_(DGED121023E)

2.	RCBS337617E	Reinforced Concrete Building Structures	3	HT_(STME240517E) HT_(RCST240617E)
3.	RCBP311817E	Reinforced Concrete Building Structures Project	1	TQ_(RCST240617E) HT_(RCBS320817E) HT_(ITCP421417E)
4.	COTE340319E	Construction Methods	4	HT_(STMA240121E) HT_(RCST240617E) HT_(SOME240118E)
5.	ORCO320519E	Organization of Construction	2	HT_(COTE340319E)
6.	TMCP310619E	Construction Methods and Management Project	1	HT_(ORCO320519E) HT_(COTE340319E)
7.	BEAE322419E	Building Estimation and Evaluation	2	HT_(COEC321119E)
8.	SBST331617E	Steel Building Structures	3	TQ_(STME240517E) HT_(STST240917E)
9.	SSTP311717E	Steel Structure Project	1	TQ_(STST240917E) HT_(ITCP421417E) SS_(SBST331617E)
10.	HRBS431217E	High-Rise Building Structures	3	TQ_(RCST240617E) HT_(RCBS320817E) HT_(ITCP421417E)
11.	FHRB430518E	Foundation Systems for High-Rise Structures	3	HT_(FOEN330318E)
12.	FEMS431121E	Finite Element Methods	3	HT_(APCO131621E) HT_(AMCO131421E) HT_(STMA240121E) HT_(STME240517E)
13.	SEMI310026E	*Enterprise Seminar*	0 (1)	
Total			**29**	

7.2.2.b Advanced Construction Engineering Courses (Practices, Labs, Internship)

No.	Course's ID	Course name	Credits	Note
1.	ENDP114617E	Engineering Drawings Practice	1	HT_(DGED121023E)
2.	SURP222819E	Survey Practice	2	
3.	SOIT220218E	Soil Investigation	2	SS_(SOME240118E)

4.	METE210321E	Mechanics Lab	1	HT_(STMA240121E)
5.	COMP211117E	Construction Materials Practice	1	HT_(COMA220717E)
6.	ITCP421417E	Information Technology in Construction Practice	2	TQ_(STMA240121E) HT_(RCST240617E) SS_(STST240917E)
7.	COIP424717E	Construction Inspection Practice	2	HT_(COMA220717E) HT_(RCST240617E) HT_(STST240917E) HT_(FOEN330518E)
8.	COTP320519E	Construction Practice	2	HT_(COMA220717E) HT_(COTE340319E)
9.	BIMP325419E	Building Information Modeling Practice	2	HT_(ENDP114617E) HT_(RCST240617E) HT_(COTE340319E) HT_(STST240917E) SS_(ORCO320519E)
10.	PBCM414519E	Practice on BIM for Construction Management	1	TQ_(BIMP325419E)
11.	ENGP422017E	Internship	2	
Total			**18**	

7.2.3. Graduation Thesis

No.	Course's ID	Course name	Credits	Note
1.	THES407517E	Graduation Thesis	10	
Total			**10**	

B – Elective Courses:

7.1 Foundation science courses

7.1.1 Social sciences and humanities (*Students select **4** credits from the list below*):

No.	Course's ID	Course name	Credits	Note
1.	GEFC220105E	General Economics	2	
2.	IQMA220205E	Introduction to Quality Management	2	
3.	INMA220305E	Introduction of Management	2	
4.	INLO220405E	Introduction to Logic	2	
5.	BPLA121808E	Business Plan	2	

6.	ENPS220591E	Engineering Psychology	2	
7.	SYTH220491E	System Thinking	2	
8.	PLSK120290E	Planning Skills	2	
9.	WOPS120390E	Workplace Skills	2	
10.	REME320690E	Research Method	2	
11.	IVNC320905E	Introduction to Vietnamese Culture	2	
12.	LESK120190E	Learning Skills	2	
Total			**4**	

7.2 Advanced Construction Engineering Courses *(Students select 8 credits)*

No.	Course's ID	Course name	Credits	Note
1.	SOIM430618E	Soil Improvement	3	HT_(SOME240118E)
2.	DCEA434917E	Design of Reinforced Concrete Structures according to ACI and Eurocode	3	TQ_(STMA240121E) HT_(RCST240617E)
3.	SUCO423917E	Sustainable Construction	2	
4.	PRMA420819E	Project Management	2	HT_(COTE340319E) SS_(ORCO320519E)
5.	SUCO323219E	Supervision Consultant	2	HT_(COTE340319E) SS_(ORCO320519E)
6.	CONM423919E	Construction Maintenance	2	HT_(COTE340319E) HT_(RCST240617E) HT_(STST240917E) HT_(FOEN330318E) SS_(COIP424717E)
7.	HSEC324019E	Health, Safety & Environment in Construction	2	HT_(COTE340319E) SS_(ORCO320519E)
8.	DEEX430818E	Deep Excavation	3	TQ_(SOME240118E) HT_(RCST240617E)
9.	DFRC435017E	Design of fiber reinforced concrete structures	3	TQ_(STMA240121E) HT_(COMA220717E)
Total			**8**	

C – Interdisciplinary Courses**:**

Students can choose 8 interdisciplinary credits to replace advanced construction engineering courses in the (elective) Section (B) 7.2:

- See the list of recommended courses in the Appendix, or
- Students can independently choose other courses outside the recommended list matching with future career development. Students should ask additional advice from the advisory board to make appropriate choices.

D – MOOC (Massive Open Online Coerces):

To facilitate enhanced access to advanced training programs, students can independently choose proposed online courses from the following table to be considered equivalent to courses in the curriculum:

No.	Course's ID	Course name	Credits	Course eligible for MOOC equivalency (registration link provided)
1.	SUCO423917E	Sustainable Construction	2	Renewable energy and green building entrepreneurship https://www.coursera.org/learn/renewable-energy-entrepreneurship
2.	DCEA434917E	Design of Reinforced Concrete Structures according to ACI and Eurocode	3	Mechanics and design of concrete structure https://ocw.mit.edu/courses/civil-and-environmental-engineering/1-054-mechanics-and-design-of-concrete-structures-spring-2004
3.	BIMP325419E	Building Information Modeling Practice	2	BIM: Building Information Modeling http://au.autodesk.com/au-online/classes-on-demand/bim
4.	COEC321119E	Construction Economy	2	Economics: Consumer Demand https://www.edx.org/course/economics-consumer-demand

8. Plan of courses

First Semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms
1.	MATH132401E	Calculus 1	3		1
2.	PHYS130902E	Physics 1	3		2
3.	ICET130117E	Introduction to Construction Engineering Technology	3(2+1)		1

4.	DGED125716E	Descriptive Geometry and Engineering Drawing	2		2
5.	APCO131621E	Applied Programing in Construction	3(2+1)		2
6.	LLCT130105E	Philosophy of Marxism and Leninism	3		1
7.	ACEN340535E	Academic English 1	4		1
8.	ACEN340635E	Academic English 2	4		2
Total			**25**		

Second Semester 2:

No.	Course's ID	Course name	Credits	Prerequisite	Terms
1.	MATH132501E	Calculus 2	3	HT_(MATH132401E)	1
2.	MATH132901E	Mathematical Statistics for Engineers	3	HT_(MATH132401E)	2
3.	PHYS131002E	Physics 2	3	HT_(PHYS130902E) HT_(MATH132401E)	1
4.	PHYS111202E	Physics Lab 1	1	HT_(MATH132401E) HT_(PHYS130902E)	1
5.	GCHE130603E	General Chemistry for Engineers	3		2
6.	FUME130221E	Fundamentals of Mechanics	3	HT_(MATH132401E)	2
7.	ARCH230216E	Principles of Architectural Design	3	HT_(DGED121023E)	1
8.	ENDP114617E	Engineering Drawings Practice	1	HT_(DGED121023E)	2
9.	GELA236939E	General Law	3		2
10.	PHED110130	Giáo dục thể chất 1 (*Physical Education 1)*	*1*		1
Total			**23**		

Third semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms

1.	AMCO131421E	Applied Mathematics in Construction	3	HT_(MATH132501E)	2
2.	MATH132601E	Calculus 3	3	HT_(MATH132401E) HT_(MATH132501E)	1
3.	SURP222819E	Survey Practice	2	HT_(DGED125716E)	1
4.	COMA220717E	Construction Materials	2		1
5.	STMA240121E	Strength of Materials	4	HT_(MATH132501E) TQ_(FUME130221E)	2
6.	WSSE221317E	Water Supply & Sewerage Engineering	2		2
7.	LLCT120314E	Ho Chi Minh's Ideology	2		2
8.	LLCT120205E	Political Economics of Marxism and Leninism	2		1
9.	x	Social Sciences and Humanities 1	2		1
10.	x	Giáo dục thể chất 2 (*Physical Education 2)*	*1*		1
Total			**22**		

Fourth semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms
1.	COEC321119E	Construction Economy	2		2
2.	METE210321E	Mechanics Lab	1	HT_(STMA240121E)	1
3.	STME240517E	Structural Mechanics	4	TQ_(FUME130221E) HT_(STMA240121E)	1
4.	SOME240118E	Soil Mechanics	4	SS_(SOIT220218E)	2
5.	SOIT220218E	Soil Investigation	2	SS_(SOME240118E)	2
6.	STST240917E	Steel Structures	4	TQ_(STMA240121E)	2

7.	RCST240617E	Reinforced Concrete Structures	4	TQ_(STMA240121E) HT_(COMA220717E)	1
8.	COMP211117E	Construction Materials Practice	1	HT_(COMA220717E)	1
9.	x	Giáo dục thể chất 3 (*Physical Education 3)*	1		1
Total			**22**		

Fifth semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms
1.	RCBS337617E	Reinforced Concrete Building Structures	3	HT_(STME240517E) HT_(RCST240617E)	1
2.	COTE340319E	Construction Methods	4	HT_(STMA240121E) HT_(RCST240617E) HT_(SOME240118E)	2
3.	SBST331617E	Steel Building Structures	3	TQ_(STME240517E) HT_(STST240917E)	2
4.	FOEN330318E	Foundation Analysis and Design	3	TQ_(SOME240118E) HT_(RCST240617E)	1
5.	FENP310418E	Foundation Engineering Project	1	TQ_(SOME240118E) HT_(RCST240617E)	2
6.	RCSP211017E	Reinforced Concrete Structures Project	1	HT_(RCST240617E)	1
7.	BIMP325419E	Building Information Modeling Practice	2	HT_(ENDP114617E) HT_(RCST240617E) HT_(COTE340319E) HT_(STST240917E)	1
8.	ITCP421417E	Information Technology in Construction Practice	2	TQ_(STME240517E) HT_(RCST240617E)	2
9.	x	Social Sciences and Humanities 2	2		1
Total			**21**		

Sixth semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms
1.	COIP424717E	Construction Inspection Practice	2	HT_(COMA220717E) HT_(RCST240617E) HT_(STST240917E) HT_(FOEN330518E)	2
2.	ORCO320519E	Organization of Construction	2	HT_(COTE340319E)	1
3.	SSTP311717E	Steel Structure Project	1	TQ_(STST240917E) HT_(ITCP421417E)	1
4.	RCBP311817E	Reinforced Concrete Building Structures Project	1	TQ_(RCST240617E) HT_(RCBS320817E) HT_(ITCP421417E)	2
5.	HRBS431217E	High-Rise Building Structures	3	TQ_(RCST240617E) HT_(RCBS320817E) HT_(ITCP421417E)	1
6.	FHRB430518E	Foundation Systems for High-Rise Structures	3	HT_(FOEN330318E)	1
7.	BEAE322419E	Building Estimation and Evaluation	2	HT_(COEC321119E)	2
8.	COTP320519E	Construction Practice	2	HT_(COMA220717E)	1
9.	LLCT120405E	Scientific Socialism	2		2
10.	x	***Elective advanced course 1***	2		2
11.	x	***Elective advanced course 2***	3		2
Total			**23**		

Seventh semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms

1.	x	***Elective advanced course 3***	3		1
2.	FEMS431121E	Finite Element Methods	3	HT_(APCO131621E) HT_(AMCO131421E) HT_(STMA240121E) HT_(STME240517E)	1
3.	TMCP310619E	Construction Methods and Management Project	1	HT_(ORCO320519E) HT_(COTE340319E)	1
4.	SEMI310026E	*Enterprise Seminar*	*1*		2
5.	PBCM414519E	Practice on BIM for Construction Management	1	TQ_(BIMP325419E)	1
6.	LLCT220514E	History of Vietnamese Communist Party	2		1
7.	ENGP422017E	Internship	2		2
Total			**12**		

Eighth semester:

No.	Course's ID	Course name	Credits	Prerequisite	Terms
1.	THES407517E	Graduation Thesis	10		1-2
Total			**10**		

9. Course Descriptions and Credit Allocations

9.1 Academic English 1 — Credits: 4

Prerequisite course(s): Communicative English 1
Corequisite course(s): Academic English 2
Previous course(s): N/A
Course Description:

This is the first course of the Academic English series designed for students majoring in the areas other than English to achieve the intermediate level of English language proficiency (equivalent to B2.1 level of CEFR) in Speaking and Listening skills. The series aims to enhance students' English competence to deal with complex matters of everyday life in other countries, to exchange specific information and personal ideas with young people and adults who speak English, and to achieve a wider understanding of thoughts from people of other cultures. This course particularly provides students with the opportunities to understand the main ideas of complex oral English on quite abstract topics, including basic technical discussions in their fields of specialization. Students are asked to orally interact with a degree of fluency that makes regular interactions with native English

speakers quite possible with some strain. They are also prepared to orally produce clear, detailed texts on a limited range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of a few options. In addition, this course promotes students' development of presentation skills, teamwork ability, and learner autonomy by engaging them in various interactive activities.

Textbooks:

Kisslinger, E., & Baker, L. (2024). *Skillful 3 Listening and Speaking* (3rd ed.). Macmillan Education.

9.2 Academic English 2 **Credits: 4**

Prerequisite course(s): Communicative English 2

Corequisite course(s): Academic English 1

Previous course(s): N/A

Course Description:

This is the second course of the Academic English series designed for students majoring in the areas other than English to achieve the intermediate level of English language proficiency (equivalent to B2.1 level of CEFR) in Reading and Writing skills. The series aims to enhance students' English competence to deal with complex matters of everyday life in other countries, to exchange specific information and personal ideas with young people and adults who speak English, and to achieve a wider understanding of thoughts from people of other cultures. This course particularly provides students with the opportunities to understand the main ideas of complex English texts on quite abstract topics, including basic technical discussions in their fields of specialization. Students are asked to interact in written English with a degree of fluency that makes regular interactions with native English speakers quite possible with some strain. They are also prepared to produce clear, detailed written texts on a limited range of subjects and explain a viewpoint on a topical issue giving the advantages and disadvantages of a few options. In addition, this course promotes students' development of presentation skills, teamwork ability, and learner autonomy by engaging them in various interactive activities.

Textbooks:

Rogers, L., & Zemach, D. E. (2024). *Skillful 3 Reading and Writing* (3rd ed.). Macmillan Education.

9.3 Philosophy of Marxism and Leninism **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description:

This course consists of three chapters, providing students with foundational knowledge as follows:

Chapter 1 introduces the fundamental concepts of philosophy, the philosophy of Marxism-Leninism, and its role in social life.

Chapter 2 explores the core principles of dialectical materialism, including the material and ideological worlds; dialectical materialism methodology; and epistemology in Marxist-Leninist thought.

Chapter 3 focuses on historical materialism, addressing concepts such as socio-economic formations, classes and nations, the state and social revolution, social consciousness, and philosophical perspectives on human beings.

9.4 Political Economics of Marxism and Leninism **2 CREDITS**

Time allocation: 2(2/0/4)

Pre-course: Philosophy of Marxism and Leninism

Prerequisite: None

Co-requisite: None

Course description:

Comprising six chapters, this course introduces the fundamentals of Marxist-Leninist political economy:

Chapter 1 explains the subject matter, research methods, and functions of political economy under Marxist-Leninist theory.

Chapters 2 to 6 cover key topics such as: commodities, markets, and the roles of economic agents; surplus value production in the market economy; competition and monopoly; socialist-oriented market economy and economic interest relations in Vietnam; industrialization, modernization, and Vietnam's international economic integration.

9.5 Scientific Socialism **2 CREDITS**

Time allocation: 2(2/0/4)

Pre-course: Philosophy of Marxism and Leninism

Prerequisite: None

Co-requisite: None

Course description:

This course consists of seven chapters.

Chapter 1 introduces the foundational issues and the evolution of scientific socialism.

Chapters 2 to 7 cover the core contents aligned with the course objectives, including the theoretical basis, values, principles, and developmental paths of socialism from a scientific perspective.

9.6 Ho Chi Minh's Ideology **2 CREDITS**

Time allocation: 2(2/0/4)

Pre-course: Philosophy of Marxism and Leninism

Prerequisite: None

Co-requisite: None

Course description:

This course comprises six chapters and provides students with essential knowledge on: the concept, object, research methods, and significance of studying Ho Chi Minh's ideology; the foundation, formation, and development process of Ho Chi Minh's ideology; Ho Chi Minh's thoughts on national independence and socialism; the Communist Party of Vietnam and the people's state; national solidarity and international unity; culture and human development; and ethics.

9.7 History of the Communist Party of Vietnam **2 CREDITS**

Time allocation: 2(2/0/4)

Pre-courses: Philosophy of Marxism and Leninism, Political Economics of Marxism and Leninism, Scientific Socialism, Ho Chi Minh's Ideology

Prerequisite: None

Co-requisite: None

Course description:

This course consists of three chapters and equips students with an understanding of the objectives, significance, and methods of studying Party history. It provides systematic and foundational knowledge of the Party's formation (1920–1930), leadership in the revolutionary struggle (1930–1945), direction of resistance wars against French colonialism and American imperialism (1945–1975), and the national unification and socialist-oriented renovation (1975–2018). The course helps affirm achievements, recognize limitations, and draw lessons in Party leadership, enhancing students' political awareness and application of historical knowledge in national development and defense.

9.8 General Law **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description:

This course provides students with fundamental knowledge of the State and law, including: general legal and political theory (origins, nature, functions, and characteristics of the state; sources, forms, and attributes of law); the legal system and legal relationships; legal violations and liabilities; and the fundamental institutions of major branches of law.

9.9 Calculus 1 **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description:

Calculus 1 introduces the fundamental concepts of limits, continuity, and the differential and integral calculus of functions of a single variable.

9.10 Calculus 2 **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: Calculus 1

Co-requisite: None

Course description:

This course expands upon Calculus 1 by covering topics including the integral calculus of single-variable functions, infinite series, power series, and vector theory in two- and three-dimensional space.

9.11 Calculus 3 **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: Calculus 1, Calculus 1I

Co-requisite: None

Course description:

This course covers multivariable calculus, including vector functions, partial derivatives, multiple integrals, line and surface integrals, and vector calculus. Applications to real-world mathematical modeling are introduced.

9.12 Mathematical Statistics for Engineers **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: Calculus 2

Co-requisite: None

Course description: This course includes descriptive statistics, elementary probability, random variables and probability distributions, statistical characteristics of random variables, parameter estimation, hypothesis testing, correlation, and linear regression.

9.13 Physics 1 **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course provides students with fundamental knowledge of physics, covering mechanics and thermodynamics, as a foundation for specialized subjects in science, engineering, and technology. It equips students with skills for studying motion, energy, and physical phenomena across scales—from molecules to planets.

Content includes Chapters 1–22 from Physics for Scientists and Engineers with Modern Physics, 9th Edition by R.A. Serway and J.W. Jewett.

The course emphasizes scientific methods, basic physical laws, scientific reasoning, and strategies for succeeding in technical studies. It focuses on both conceptual understanding and standard problem-solving skills.

Additionally, students will learn how to construct mathematical models based on experimental data, record and analyze results, and apply models to predict outcomes in other experiments, while understanding their limitations.

9.14 Physics 2 **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: Physics Lab 1

Prerequisite: Physics 1, Calculus 1, Calculus 2

Co-requisite: None

Course description: This course covers the fundamentals of electromagnetism and optics, providing a foundation for engineering and technology majors.

Content includes Chapters 23–38 from Physics for Scientists and Engineers with Modern Physics, 9th Edition by R.A. Serway and J.W. Jewett.

It emphasizes understanding physical laws, scientific reasoning, and preparation for advanced studies. Like Physics 1, the course integrates theory with problem-solving.

Students will also practice mathematical modeling, data presentation and analysis, and prediction of experimental outcomes, while recognizing model limitations.

9.15 Physics Lab 1 1 CREDITS

Time allocation: 1(0/1/2)

Pre-course: Physics 1

Prerequisite: Calculus 1

Co-requisite: None

Course description: This lab course includes 9 experiments in kinematics, dynamics of particles and rigid bodies, and thermodynamics. It reinforces physics theory through observation, experimentation, measurement, calculation, and data analysis. The course develops practical skills essential for future engineers.

9.16 General Chemistry for Engineers 3 CREDITS

Time allocation: 3(3/0/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course equips students with fundamental chemistry knowledge needed to understand scientific and technical documents in related fields.

Students will:

(i) Understand atomic and molecular structures to explain material properties.

(ii) Develop problem-solving skills involving thermodynamics, chemical kinetics, equilibrium, solution properties, and electrochemical processes.

This foundational course supports advanced study and application in engineering disciplines and beyond.

9.17 Introduction to Construction Engineering Technology 3 CREDITS

Time allocation: 3(2/1/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course introduces students to program learning outcomes, curriculum structure, and characteristics of the Construction Engineering Technology program. It also explores professional traits, soft skills, ethics, and responsibilities. The course helps students plan their studies and career paths.

9.18 Applied Programming in Construction 3 CREDITS

Time allocation: 3(2/1/6)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course provides basic programming skills using VBA. Students will learn to write VBA programs to solve technical problems, especially in matrix data processing, graphing, equation solving (linear/nonlinear), differential equations, and numerical integration. They will also design user interfaces in VBA.

9.17. Applied Mathematics in Construction 3 CREDITS

Time allocation: 3(3/0/6)

Pre-course: Calculus 2

Prerequisite: None

Co-requisite: None

Course description: The course introduces and applies mathematical concepts such as integration, differential equations, and linear/nonlinear systems to engineering and construction-related problems. It builds a solid foundation for applying algorithms in specialized technical subjects.

9.19 Construction Economy 2 CREDITS

Time allocation: 2(2/0/4)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course introduces students to the economic characteristics of the construction industry and methods for estimating construction costs. It also provides the theoretical basis for evaluating and selecting design options, technical solutions, and investment projects. Students will understand how technical advancements can reduce costs and how economic and social factors influence construction projects.

9.20 Descriptive Geometry and Construction Drawing 2 CREDITS

Time allocation: 2(2/0/4)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course provides fundamental knowledge of orthographic projections and technical drawing standards. It also develops discipline and creative thinking skills necessary for construction design.

9.21 Fundamentals of Mechanics 3 CREDITS

Time allocation: 3(3/0/6)

Pre-course: Calculus 1, Calculus 2

Prerequisite: None

Co-requisite: Calculus 2, Physics 1

Course description: This course builds foundational knowledge for core engineering subjects such as Strength of Materials and Structural Mechanics. It studies equilibrium states of rigid bodies and systems under force systems. The course also introduces

internal forces, methods to determine internal force components on cross-sections, and techniques to draw internal force diagrams using both transformation methods and shortcut approaches.

9.22 Strength of Materials **4 CREDITS**

Time allocation: 4(4/0/8)

Pre-course: Calculus 2

Prerequisite: Fundamentals of Mechanics

Co-requisite: None

Course description: This course provides students with fundamental methods for analyzing bar-type structures. It covers material mechanical properties and methods to calculate strength, stiffness, and stability of basic elements in bars. Topics include internal force analysis on cross sections in planar structures (beams, bars, frames), stress and strain analysis in bar elements, stress states, and calculations for statically determinate and indeterminate systems to ensure conditions of strength, stiffness, and stability.

9.23 Soil Mechanics **4 CREDITS**

Time allocation: 4(4/0/8)

Pre-course: None

Prerequisite: None

Co-requisite: Soil Investigation

Course description: This course equips students with basic knowledge of the physical and mechanical nature of soil, computational theories, experimental methods, and applications of soil mechanics in construction. It serves as a foundational basis for the course on Foundations Engineering. The course has strong practical application.

9.24 Structural Mechanics **4 CREDITS**

Time allocation: 4(4/0/8)

Pre-course: Strength of Materials

Prerequisite: Fundamentals of Mechanics

Co-requisite: None

Course description: This course provides knowledge and skills to calculate internal forces and displacements in building structures. It develops the ability to analyze statically determinate and indeterminate systems, forming a basis for structural design using various materials. It also covers principles of structural formation to ensure load-bearing capacity.

9.25 Reinforced Concrete Structures **4 CREDITS**

Time allocation: 4(4/0/8)

Pre-course: Construction Materials

Prerequisite: Strength of Materials

Co-requisite: None

Course description: This course provides basic knowledge about reinforced concrete materials and the design and checking of basic reinforced concrete components (bending, tension, compression members, etc.). It also introduces fundamental concepts of prestressed concrete structures.

9.26 Reinforced Concrete Structures Project **1 CREDITS**

Time allocation: 1(0/1/2)

Pre-course: **Reinforced Concrete Structures**

Prerequisite: None

Co-requisite: **Reinforced Concrete Building Structures**

Course description: This is an applied course for the reinforced concrete group, helping students get familiar with practical knowledge on designing reinforced concrete components. It integrates specialist knowledge related to reinforced concrete structures and develops analytical skills to select reasonable design solutions.

9.27 Construction Materials **2 CREDITS**

Time allocation: 2(2/0/4)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course provides students with fundamental knowledge of the mechanical and physical properties of building materials. Students learn to select and use materials for various construction projects to meet economic and technical requirements.

9.28 Steel Structures **4 CREDITS**

Time allocation: 4(4/0/8)

Pre-course: None

Prerequisite: Strength of Materials

Co-requisite: None

Course description: This course provides knowledge about steel materials in construction, calculation of simple connections (welded, bolted, riveted), and design of basic steel components (beams, columns, trusses) made of shaped steel or composite steel. It also covers fundamental knowledge of steel–reinforced concrete composite structures in construction.

9.29 Water Supply & Sewerage Engineering **2 CREDITS**

Time allocation: 2(2/0/4)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description: This course provides students with fundamental knowledge of fluid mechanics such as flow rate, pressure, and flow velocity. It also covers principles and methods for analyzing, positioning, sizing, and understanding the relationship between components of water supply and drainage systems in buildings. Additionally, it explores the connection between internal (building) and external (urban) systems. The course enables students to perform basic designs of both internal and external water supply and drainage systems for construction projects.

9.30 Foundation Analysis and Design **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: Reinforced Concrete Structures

Prerequisite: Soil Mechanics

Co-requisite: None

Course description: This course equips students with procedures for designing, calculating, and testing various types of foundations. Emphasis is placed on proposing and selecting appropriate foundation solutions based on site geology, applied loads, and construction technology. Foundation design is closely tied to both the superstructure and the soil beneath, thus requiring integration with courses like Reinforced Concrete Structural Systems, High-rise Structures, and Soil Mechanics. The course also aligns with current design, testing, and construction standards.

9.31 Foundation Engineering Project 1 CREDITS

Time allocation: 1(0/1/2)

Pre-course: Reinforced Concrete Structures

Prerequisite: Soil Mechanics

Co-requisite: **Foundation Analysis and Design**

Course description: This project course helps students consolidate their knowledge in geology, soil mechanics, and foundation engineering. Students apply this knowledge to the design and calculation of foundations for real-world projects, considering both shallow and deep foundation types. Design solutions must comply with current standards.

9.32 Principles of Architectural Design 3 CREDITS

Time allocation: 3(3/0/6)

Pre-course: Descriptive Geometry, Technical Drawing

Prerequisite: None

Co-requisite: None

Course description: This course consists of three main parts:

Fundamentals: Introduces concepts, design principles, and classifications in construction design, as well as factors influencing design solutions.

Architectural Design: Covers construction procedures, drawing content, applicable standards, and the rationale behind architectural design.

Architectural Structure Design: Discusses basic issues in architectural structures and provides detailed analysis and design of structural parts from the base to the top of a building.

9.33 Reinforced Concrete Building Structures 3 CREDITS

Time allocation: 3(3/0/6)

Pre-course: Structural Mechanics, Reinforced Concrete Structures

Prerequisite: None

Co-requisite: None

Course description: This course provides specialized knowledge in structural engineering. It includes modeling and calculation of reinforced concrete building components. Students also develop basic skills for designing reinforced concrete structural systems.

9.34 Reinforced Concrete Building Structures Project 1 CREDITS

Time allocation: 1(0/1/2)

Pre-course: Reinforced Concrete Building Structures, Information Technology in Construction Practice

Prerequisite: Reinforced Concrete Structures

Co-requisite: None

Course description: This is an advanced course in the reinforced concrete structures group, providing specialized knowledge in structural engineering. It focuses on modeling, calculation, and design of structural components. A key objective is to develop analytical skills for selecting appropriate structural solutions.

9.35 Construction Methods 4 CREDITS

Time allocation: 4(4/0/8)

Pre-course: Strength of Materials, Reinforced Concrete Structures, Soil Mechanics

Prerequisite: None

Co-requisite: None

Course description:

This course belongs to the knowledge group of construction techniques and management. It equips students with fundamental knowledge of construction methods for various components of a building including substructure, superstructure, finishing works, and prefabricated construction techniques. It also introduces the machinery and equipment used in construction activities.

9.36 Organization of Construction 2 CREDITS

Time allocation: 2(2/0/4)

Pre-course: Construction Methods

Prerequisite: None

Co-requisite: None

Course description:

A theoretical course in the field of construction economics and management, providing basic knowledge about project management, including planning, organization, execution, and control of construction projects from inception to completion. Topics include decision-making, resource management under time and budget constraints, project organization models, scheduling methods, cost control, and risk management.

9.37 Construction Techniques and Organization Project 1 CREDITS

Time allocation: 1(0/1/2)

Pre-course: Construction Methods, Organization of Construction

Prerequisite: None

Co-requisite: None

Course description:

This project-based course allows students to apply their knowledge of construction techniques and organization to practical problems. Students will solve real-world construction tasks such as excavation, earthworks, formwork, reinforcement, and concrete works. It aims to provide students with hands-on experience in site operations to prepare them for internships and graduation projects.

9.38 Construction Estimation and Valuation 2 CREDITS

Time allocation: 2(2/0/4)

Pre-course: Construction Methods, Reinforced Concrete Structures

Prerequisite: None

Co-requisite: None

Course description:

This course provides basic knowledge to help students estimate various types of costs for construction projects based on current Vietnamese regulations, enabling them to prepare conceptual and detailed estimates. It also trains students to assess project values over time.

9.39 Steel Structure Design **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: Steel Structures, Structural Mechanics

Prerequisite: None

Co-requisite: None

Course description:

This course introduces students to commonly used steel structural systems such as single-story industrial buildings, long-span buildings, and multi-story steel buildings. It covers structural modeling, load determination, and detailing. It also helps students build the necessary knowledge and skills for completing steel structure design projects and graduation theses.

9.40 Steel Structure Design Project **1 CREDITS**

Time allocation: 1(0/1/2)

Pre-course: Information Technology in Construction Practice

Prerequisite: Steel Structures

Co-requisite: Steel Structure Design

Course description:

This course allows students to apply theoretical knowledge of steel structures and steel building systems in the detailed design of a single-span, single-story industrial building with an overhead crane.

9.41 High-rise Building Structures **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: Reinforced Concrete Building Structures, Information Technology in Construction Practice

Prerequisite: Reinforced Concrete Structures

Co-requisite: None

Course description:

An advanced course in the reinforced concrete structure group, this course provides specialized knowledge on structural engineering of high-rise buildings and structural dynamics. It includes methods for analyzing structures under basic and special loads, and skills in selecting appropriate structural solutions.

9.42 Foundations for High-rise Buildings **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: Foundation Engineering

Prerequisite: None

Co-requisite: None

Course description:

This advanced course in construction technology and engineering equips students with in-depth knowledge of foundation design for high-rise buildings. Topics include principles and evaluation methods for selecting suitable foundation solutions. It helps learners synthesize foundational knowledge and approach real-world engineering problems to develop sound engineering judgment.

9.43 Finite Element Method **3 CREDITS**

Time allocation: 3(3/0/6)

Pre-course: Applied Programming in Construction, Applied Mathematics in Construction, Strength of Materials, Structural Mechanics

Prerequisite: None

Co-requisite: None

Course description:

This course equips students with fundamental knowledge of the Finite Element Method (FEM) for structural analysis. Students learn to solve structural problems using hand calculations or programming, assess accuracy and convergence, and apply commercial FEM software such as Etabs, Safe, Plaxis, Abaqus, and Ansys effectively.

9.44 Enterprise Seminars (Construction Engineering) **1 CREDITS**

Time allocation: 1(1/0/2)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course description:

This course fosters creativity and entrepreneurship in the construction field, encouraging students to generate innovative, breakthrough ideas relevant to the industry.

9.45 Construction Technical Drawing Practice **1 CREDITS**

Time Allocation: 1(0/1/2)

Pre-course: Descriptive Geometry, Technical Drawing

Prerequisite: None

Co-requisite: None

Course Description: This course provides fundamental knowledge and skills for reading architectural and construction drawings. Students will learn how to create architectural and technical drawings using graphic software (CAD). The course also introduces basic construction terminology (component names, building elements, types of construction drawings) and the structure and representation of basic components in construction (e.g., RC structures: foundations, columns, beams, slabs, stairs, water tanks; steel structures: columns, trusses, bracing systems, and connection details).

9.46 Surveying Practice **2 CREDITS**

Time Allocation: 2(0/2/4)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course Description: This course helps students apply theoretical surveying knowledge in practice. Students will carry out basic measurement and layout tasks using theodolites and leveling instruments. Practice topics include: getting familiar with optical theodolites, measuring horizontal angles (simple and full-circle methods), measuring vertical angles, measuring distances (direct and indirect), trigonometric leveling, using leveling instruments, differential leveling, and establishing control networks for coordinates and elevations..

9.47 Soil Investigation **2 CREDITS**

Time Allocation: 2(0/2/4)

Pre-course: None

Prerequisite: None

Co-requisite: Soil Mechanics

Course Description: This course equips students with essential knowledge and skills in soil investigation and testing for construction purposes. Students will learn how to plan and carry out site investigations, select appropriate methods, collect geotechnical data, and compile reports..

9.48 Mechanics Lab **1 CREDITS**

Time Allocation: 1(0/1/2)

Pre-course: Strength of Materials

Prerequisite: None

Co-requisite: None

Course Description: This course provides students with basic knowledge and skills in measuring and testing the mechanical properties of metallic materials. It enables students to validate theoretical concepts studied in applied mechanics courses.

9.49 Construction Materials Practice **1 CREDITS**

Time Allocation: 1(0/1/2)

Pre-course: Construction Materials

Prerequisite: None

Co-requisite: None

Course Description: This course provides foundational knowledge for conducting physical and mechanical property tests on common construction materials such as clay bricks, sand, aggregates, cement, and concrete. It also covers concrete mix proportioning.

9.50 Information Technology in Construction Practice **2 CREDITS**

Time Allocation: 2(0/2/4)

Pre-course: Reinforced Concrete Structures

Prerequisite: Strength of Materials

Co-requisite: None

Course Description: This course reinforces students' foundational knowledge in structural mechanics and materials (Strength of Materials, Structural Analysis, RC Structures, Steel Structures). It also provides basic skills in using structural analysis software (e.g., ETABS, SAFE) to model and analyze structures from simple to complex systems.

9.51 Structural Inspection Practice **2 CREDITS**

Time Allocation: 2(0/2/4)

Pre-course: Construction Materials, RC Structures, Steel Structures, Foundations analysis and design

Prerequisite: None

Co-requisite: None

Course Description: This course provides essential knowledge in testing and inspecting structures. Topics include: survey methods, lab equipment usage, material and structural quality assessment, load-bearing capacity, and service life evaluation. Students will also perform RC beam testing and gain hands-on experience with procedures and technical standards in structural testing and quality control.

9.52 Construction Practice 2 CREDITS

Time Allocation: 2(0/2/4)

Pre-course: Construction Materials, Construction Methods

Prerequisite: None

Co-requisite: None

Course Description: This course equips students with practical skills at construction sites. Students will implement construction techniques in real-world conditions including masonry, plastering, painting, formwork installation, steel reinforcement work (for beams, slabs, columns, walls), and mortar mixing. It also introduces the use of common construction tools such as drills, steel cutters, wall chippers, tile cutters, and concrete sprayers.

9.53 BIM in Construction Practice 2 CREDITS

Time Allocation: 2(0/2/4)

Pre-course: Construction Technical Drawing Practice, Reinforced Concrete Structures, Construction Techniques, Steel Structures

Prerequisite: None

Co-requisite: Construction Organization

Course Description: This practice-based course introduces students to the fundamentals of Building Information Modeling (BIM) in construction design and management. As a trend-oriented subject aligned with the development direction of Vietnam and the global construction industry, the course provides basic knowledge of BIM and guides students in using BIM tools to design a simple project. Based on a project-based learning approach, the course requires effective self-learning methods for task completion.

9.54 Practice on BIM for Construction Management 1 CREDITS

Time Allocation: 1(0/1/2)

Pre-course: None

Prerequisite: BIM in Construction Practice

Co-requisite: None

Course Description: This practical course focuses on applying Building Information Modeling (BIM) in construction project management. Students will learn to resolve interdisciplinary conflicts, simulate project schedules and costs using Autodesk Navisworks. Following a project-based learning model, the course emphasizes independent study and problem-solving to meet project requirements.

9.55 Internship (Construction Engineering Technology) 2 CREDITS

Time Allocation: 2(0/2/4)

Pre-course: None

Prerequisite: No course debts, as regulated by the Faculty of Civil Engineering

Co-requisite: None

Course Description: After completing theoretical and practical training, students will undergo an 8-week internship at construction sites or design companies. This experience consolidates their knowledge through real-world applications and prepares them for the graduation project. During the internship, students gather materials and data for their final report.

9.56 Soil Improvement 3 CREDITS

Time Allocation: 3(3/0/6)

Pre-course: None

Prerequisite: Soil Mechanics

Co-requisite: None

Course Description: This course provides knowledge of soft soil, including classification, properties, deformation characteristics, and bearing capacity under construction loads. It introduces basic methods for soft soil improvement and has strong relevance to subjects such as Engineering Geology, Soil Mechanics, and Foundation Engineering. The course is highly practical.

9.57 RC Structural Design According to ACI & EUROCODE 3 CREDITS

Time Allocation: 3(3/0/6)

Pre-course: Reinforced Concrete Structures

Prerequisite: Strength of Materials

Co-requisite: None

Course Description: This course equips students with fundamental knowledge for designing reinforced concrete structures according to ACI-318 (USA) and EUROCODE (EU) standards, including flexural, tensile, and compressive members.

9.58 Sustainable Construction 2 CREDITS

Time Allocation: 2(2/0/4)

Pre-course: None

Prerequisite: None

Co-requisite: None

Course Description: This course introduces basic concepts and evaluation standards in sustainable construction. Students will study the physics and calculations related to hydraulics, HVAC, lighting, thermal behavior, and materials. They will apply this knowledge to design and evaluate a typical building using LOTUS and QCVN 09 standards. Additional topics include financial and transportation aspects relevant to sustainable projects.

9.59 Project Management 2 CREDITS

Time Allocation: 2(2/0/4)

Pre-course: Construction Methods

Prerequisite: None

Co-requisite: Organization of Construction

Course Description: This course provides fundamental project management knowledge, including planning, executing, and controlling a construction project from inception to completion. It covers decision-making under constraints (time, cost, human resources), project organization models, scheduling methods, resource allocation, and risk management.

9.60 Supervision Consultant 2 CREDITS

Time Allocation: 2(2/0/4)

Pre-course: Construction Methods, Reinforced Concrete Structures, Foundation analysis and design

Prerequisite: None

Co-requisite: None

Course Description: The course introduces requirements for quality management in construction based on Vietnamese ISO 9000 standards for construction organizations. Students will learn about quality control procedures and project acceptance from the start to completion and handover.

9.61 Construction Maintenance 2 CREDITS

Time Allocation: 2(2/0/4)

Pre-course: Construction Methods, RC Structures, Steel Structures, Foundation analysis and design

Prerequisite: None

Co-requisite: Structural Inspection Practice

Course Description: This advanced course in construction engineering equips students with knowledge and skills to assess structural defects and failures, analyze causes, propose repair and strengthening solutions, and evaluate structural capacity before and after reinforcement.

9.62 Safety, Health and Environment in Construction 2 CREDITS

Time Allocation: 2(2/0/4)

Pre-course: Construction Methods

Prerequisite: None

Co-requisite: Organization of Construction

Course Description: This course provides basic knowledge of health, safety, and environmental (HSE) issues for construction site workers and identifies factors affecting HSE. Students will understand the roles and responsibilities of HSE departments and learn to develop and assess HSE systems for construction projects/

9.63 Deep Excavation 3 CREDITS

Time Allocation: 3(3/0/6)

Pre-course: None

Prerequisite: Soil Mechanics, Reinforced Concrete Structures

Co-requisite: None

Course Description: This course provides theoretical foundations for analyzing safety factors, stress-strain behavior in deep excavations, and their impact on adjacent structures under various geological conditions. It includes practical skills in applying the finite element method (Plaxis software) for analysis, design, and construction planning of deep excavation projects.

9.64 Design of Fiber-Reinforced Concrete Structures 3 CREDITS

Time Allocation: 3(3/0/6)

Pre-course: Construction Materials

Prerequisite: Strength of Materials

Co-requisite: None

Course Description: This course introduces students to the design of special concrete structures reinforced with fibers (steel, glass, carbon, polymers). These materials enhance tensile strength, reduce shrinkage, and improve flexural performance and durability in harsh environments. The course also provides in-depth knowledge of concrete materials used in construction..

9.65 Graduation Thesis 10 CREDITS

Time Allocation: 10(0/10/20)

Pre-course: None

Prerequisite: No outstanding courses as specified by the Faculty of Civil Engineering (currently in effect)

Co-requisite: None

Course Description:

This course provides students with comprehensive knowledge and skills related to the structural design process of a real construction project. Utilizing all the knowledge and skills accumulated throughout their studies, students are required to design a realistic building that satisfies specific design requirements, while also considering economic conditions and sustainable development principles. Analysis and design outcomes must be documented in a technical report and construction drawings.

The graduation thesis simulates a structure with real-life dimensions and constraints. The assigned design tasks require students to complete at least the following:

1. *List loads and load effects, prepare load combinations and tables; apply appropriate load factors, material resistance factors, and combination factors reflecting the probability of simultaneous load occurrence;*
2. *Select suitable materials based on usage requirements, architectural principles, and the nature and magnitude of the loads;*
3. *Present the structural analysis model and calculate the imposed loads on the structure; determine internal force combinations based on applicable standards and regulations;*
4. *Perform internal force analysis and structural design for each component. Calculations must cover strength, stiffness, and stability of components and the entire structure;*
5. *Evaluate the appropriateness of the structural model with respect to code requirements on strength, stiffness, and stability;*
6. *Design foundation alternatives for the building;*
7. *Prepare construction drawings for the components included in the calculations.*

10. Facilities for Learning

10.1. Workshops and Laboratories

- Mechanics Laboratory
- Mechanics Engineering Workshop
- Structural Laboratory
- Geotechnical Laboratory
- Construction Material Laboratory
- Construction Practice Workshop

10.2. Library, Website

- University's Library
- Faculty's Library
- Faculty's Website

11. Program Implementation Guidelines

The training program is implemented in accordance with the current regulations for full-time university-level credit-based training, as stipulated by the Ministry of Education and Training and Ho Chi Minh City University of Technology and Education.

The specified hours are calculated as follows:

- 1 credit = 15 hours of theoretical lectures or in-class discussions
- 1 credit = 30 - 45 hours of laboratory work or practical exercises
- 1 credit = 30 hours of self-study
- 1 credit = 45 - 90 hours of on-site internship
- 1 credit = 45 - 60 hours for project work or graduation thesis

The total hours for a course must be a multiple of 15.

Political Theory Knowledge: Implemented according to the regulations of the Ministry of Education and Training.

Foreign Language Knowledge: The foreign language output standard is determined by the university's Science and Training Council at the beginning of each admission cohort. Throughout their studies, the university will monitor the students' foreign language proficiency development each academic year to decide the number of credits for courses that students are allowed to register for in a semester. Students can self-study or register for the foreign language proficiency development program according to the university's plan.

Physical Education Knowledge: Implemented according to the regulations of the Ministry of Education and Training. For Physical Education 2 and 3, students can select from the course catalog when registering for modules.

National Defense Education Knowledge: Implemented according to the regulations of the Ministry of Education and Training. Students accumulate credits and are granted a certificate after completing the requirements of the module.

Elective Social Sciences and Humanities Knowledge: Students select 2 courses, equivalent to 4 credits, from the course catalog when registering for modules.

Elective Foundational Major Knowledge: Students select 2 courses, equivalent to 6 credits, from the course catalog when registering for modules.

Elective Specialized Major Knowledge: Students select 2 courses, equivalent to 6 credits, from the course catalog when registering for modules.

The remaining knowledge blocks are arranged into 8 semesters as presented in section 8.

VICE PRESIDENT	DEAN OF FACULTY OF INTERNATIONAL EDUCATION
Dr. Quach Thanh Hai	**Assoc. Prof. Dr. Truong Dinh Nhon**

APPENDIX: INTERDISCIPLINARY COURSES

No.	Course code	Course	Credits	Prerequisite (if any)
1.	MEPM422219E	MEP Management	2	HT_(COTE340319E) SS_(COMA331719E)
2.	COMA323119E	Construction Marketing	2	HT_(COLA322519E)
3.	PMAO423319E	Property Management & Operation	2	HT_(MEPM422219E) HT_(COTE340319E)
4.	GEIS223419E	Geographic Information System	2	HT_(SURP222819E)
5.	QCCE423519E	Quality Control in Civil Engineering	2	HT_(COTE340319E) HT_(COMA331719E) HT_(COLA322519E)
6.	AMAT422222E	Advanced Construction Materials	2	HT_(COMA220717E)