

**MINISTRY OF EDUCATION AND TRAINING**

**LAC HONG UNIVERSITY**

# **PROGRAMME SPECIFICATION**

**UNDERGRADUATE PROGRAMME**

**MAJOR: CONSTRUCTIONENGINEERING TECHNOLOGY**

**PROGRAM CODE: 7510102**

**TYPE OF STUDY: FULL-TIME**

**FACULTY: FACULTY OF CIVIL ENGINEERING**

**Dong Nai, 2022**

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**UNDERGRADUATE PROGRAMME**

(Issued under decision No. 752 QĐ-DHLH dated August 30, 2022 of the Rector of Lac Hong University)

**A. GENERAL INFORMATION**

- 1. Name of programme (Vietnamese):** Công nghệ kỹ thuật công trình xây dựng
- 2. Name of programme (English):** Construction Engineering Technology
- 3. Programme level:** Undergraduate
- 4. Programme code:** 7510102
- 5. Training duration:** 4 years
- 6. Type of study:** Full-time
- 7. Graduation degree:** The degree of Engineer

**8. Admission criteria:**

Option 1: Basing on the National High School Exam scores

Students who:

- ✓ graduated from high school
- ✓ achieved the cut-off score set by MOET

Option 2: Basing on the school report of Grade 12

Students who:

- ✓ graduated from high school
- ✓ achieved the GPA for the whole year of grade 12  $\geq 6$  (or GPA for 3 years of grades 10, 11 and 12  $\geq 6$ )

Option 3: Basing on Competency Exam scores

- ✓ the National Competency Exam scores
- ✓ LHU Competency Exam scores

Option 4: Direct admission to students

- ✓ winning the first, second and third prize in science and technology contests or in excellent student contests from provincial level
- ✓ achieving good performance in three years of grades 10, 11 and 12

- ✓ attending gifted high schools
- ✓ achieving international English certificates
- ✓ attending one of the top 200 high schools in Vietnam
- ✓ attending high schools signing up to educational cooperation with LHU

### **9. Graduation requirements:**

Students must meet the following conditions in order to graduate

- ✓ Not being prosecuted for criminal liabilities, not in the period of being disciplined as suspension;
- ✓ Accumulating sufficient number of credits and volumes of the curriculum
- ✓ The cumulative GPA is at least 5.00/10.0 or higher;
- ✓ Having a certificate of national defense education and physical education;
- ✓ Meeting the standards of the foreign language according to the LHU regulations;
- ✓ Having the certificate of basic information technology according to the LHU regulations;
- ✓ Having the certificate of soft skills according to the LHU regulations.

### **10. Job positions:**

Students who graduate with the Bachelor degree in Civil Engineering can find their jobs in the following positions:

- ✓ Governmental organizations: including research centers; Institutes, Ministry of construction or Department of construction of local authorities.
- ✓ Private companies and corporations, foreign companies: there are a lot of private companies working in the Civil engineering field. Their main purposes include Consulting, Site construction manager, Designing, and Maintaining infrastructures. Other opportunities: students who graduate from the Civil Engineering field can work in the companies in related fields such as civil materials, building for construction, maintaining buildings, real estate business etc.

### **11. Ability to develop higher level of education:**

Graduates from this course can enroll in the master degree programme in the same or relevant fields.

### **12. Special features:**

The curriculum is designed to include the first 8 semesters to provide generic knowledge and skills in Civil Engineering so that students have the ability to meet the basic requirements of career activities in the construction fields.

The special curriculum including three domains: 40% theory, 30% practice in workshop & laboratory, and 30% practical learning on construction site. This helps students to effectively respond to the job requirements.

During the study period, students have the opportunity to participate in many extracurricular activities such as English Club, AutoCAD free courses, Revit Club, Midas Club, SAP Club and the contests like Art contest "The Memorial School", Design contest "Energy Saving House" and "Creative Bridge" and so on. Through these activities, students can both relax after stressful study time and improve their English and other soft skills such

as teamwork skills, relationship-building skills, and interpersonal skills, as well as proficient skills of using majors' software. All of these skills are essential for students to succeed in their current studies and future careers.

## **B. EDUCATIONAL PHILOSOPHY, VISION AND MISSION**

### **I. LHU's Educational philosophy**

"Morality - Intelligence - Creativity"

### **II. Mission and Vision of LHU**

#### **Mission:**

LHU is an institution for training, applied research, technology transfer and community services to meet social needs. The University provides human resources and cultivates talents, serving the national industrialization and modernization in the context of international integration.

#### **Vision:**

LHU aims to become a leading university in applied sciences in Vietnam by 2030.

### **III. Mission and Vision of FCE**

#### **Mission:**

FCE is a unit in training and applied scientific research in the construction field. FCE provides graduate and post-graduate human resources meeting international integration.

#### **Vision:**

FCE aims to become a prestigious unit in training human resources capable of catching up with the technological era by 2030.

## **C. OBJECTIVES AND LEARNING OUTCOMES OF PROGRAMME**

### **I. Programme Educational Objectives (PEOs)**

The Faculty of Civil Engineering educates and equips students with practical knowledge, useful skills and good attitudes so that after graduating from 3-5 years, students majoring in Construction Engineering Technology will:

- PEO1: become construction engineers catching up with the technology era with professional ethics, dynamism, and creativity;
- PEO2: develop their capability of lifelong learning and self-training as managers.

### **II. Programme learning outcomes (PLOs)**

FCE has set up the Program Learning Outcomes (PLOs) based on the contents of the PEOs and meetings with the stakeholders, namely members of the scientific board, lecturers, employers, alumni and students. Their ideas and suggestions have been welcomed and taken into serious consideration to build up FCE's ten PLOs.

- PL01: Use major software proficiently in the field of Construction Engineering Technology
- PL02: Perform construction materials experiments
- PL03: Apply modern techniques and technology in the field of Construction Engineering Technology
- PL04: Implement construction project based on design document
- PL05: Design constructions in the field of Construction Engineering Technology
- PL06: Adapt to working environment on a digital platform
- PL07: Demonstrate ideas effectively through written, oral and visual communication
- PL08: Improve teamwork skills effectively in engineering environment

- PL09: Develop ability for life-long learning
- PL10: Show professional manners and ethics

### III. Mapping the objectives and the expected learning outcomes of the programme

Domains	PLOs	PEO1	PEO2	Cognitive level	Bloom's Taxonomy domain
<b>Specialized knowledge relating to the knowledge and skills of the construction industry</b>	<b>PLO1:</b> Use specialized software proficiently in the field of CET	X		4	Knowledge
	<b>PLO2:</b> Perform construction materials experiments	X		4	Knowledge
	<b>PLO3:</b> Apply modern techniques and technology in the field of CET	X		4	Knowledge
	<b>PLO4:</b> Implement construction project based on design document	X	X	4	Knowledge
	<b>PLO5:</b> Design constructions in the field of CET	X		5	Knowledge
<b>General knowledge relating to awareness, ethics and supporting skills of the field.</b>	<b>PLO6:</b> Adapt to working environment on a digital platform		X	4	Skill
	<b>PLO7:</b> Demonstrate ideas effectively through written, oral and visual communication in technical and non-technical environment	X	X	5	Skill
	<b>PLO8:</b> Work effectively in team in a technical environment	X	X	5	Skill
	<b>PLO9:</b> Develop ability for life-long learning		X	5	Attitude
	<b>PLO10:</b> Show professional manners and ethics	X		4	Attitude

#### IV. Dividing PLOs into PIs

	<b>PLOS</b>	<b>PI Criteria</b>
<b>PLO1</b>	Use major software in the field of Construction Engineering Technology proficiently;	PI1: Use major software proficiently in engineering drawing;
		PI2: Use major software proficiently in construction estimates and building;
		PI3: Use major software proficiently in construction project management;
<b>PLO2</b>	Perform construction materials experiments;	PI1: Perform experiments on solid materials
		PI2: Perform experiments on loose materials
		PI3: Use supporting equipment related to construction techniques proficiently;
<b>PLO3</b>	Apply modern techniques and technology in the field of Construction Engineering Technology;	PI1: Applying Building Information Modeling (BIM) in the construction industry
		PI2: Applying modern solutions in the construction industry
		PI3: Applying new material technology in the construction industry
		PI4: Apply surveying technologies in the field of geodesic.
<b>PLO4</b>	Implement construction project based on design document;	PI1: Explain exactly how basic components work
		PI2: Deploy basic components from drawings through hands-on activities in the workshop
		PI3: Evaluate the accuracy of components between actual construction and design drawings through actual construction activities
		PI4: Planning construction methods of basic components
<b>PLO5</b>	Design constructions in the field of Construction Engineering Technology;	PI1: Propose structural design models
		PI2: Design of construction documents
		PI3: Assessing the rationality of practical components through actual construction activities.
<b>PLO6</b>	Adapt to working environment on a digital platform;	PI1: Make use of multimedia technology to make reports
		PI2: Exploit digital resources
		PI3: Deploy digital-based tasks
<b>PLO7</b>	Demonstrate ideas effectively through written, oral and visual communication;	PI1: Express ideas in the verbal language in technical and non-technical environments effectively
		PI2: Express ideas in written language in technical and non-technical environments effectively
		PI3: Express ideas in the visual language in technical and non-technical environments effectively
<b>PLO8</b>	Improve teamwork skills effectively in engineering environment;	PI1: Plan activities for leaders and team members
		PI2: Motivate the members to complete the tasks well and on time
		PI3: Perform personal work within the assigned timeline
<b>PLO9</b>	Develop ability for life-long learning;	PI1: Use necessary tools for looking up documents effectively
		PI2: Develop learning and self-study methods
		PI3: Act habitually for self-study
<b>PL10</b>	Show professional manners and ethics;	PI1: Show professional manners in the learning process
		PI2: Using references with citations in technical and non-technical environments
		PI3: Comply with the professional ethical standards of engineers

## D. STRUCTURE AND CONTENT OF PROGRAMME

### I. Structure of curriculum

Sections of knowledge		Total credits
General courses	Political Philosophy	11
	Social Sciences	2
	Foreign Language	12
	Mathematics, Informatics, Natural Sciences, Technology	6
Professional course	Basis Courses	23
	Specialized Courses	80
	Other courses	6
Graduation Assignment	Graduation thesis	10
<b>Minimum cumulative total credits</b>		<b>150</b>

### II. Curriculum

Course ID	Course Title	No. of Credits				No. of Periods
		Total No. of Credits	Theory	Practice	Assignment	
	Defense Education					165
102002	Physical Education 1	0	0	0	0	30
102015	Mathematics A1	3	2	0	1	60
102055	English 1	2	2	0	0	30
124057	Masonry Techniques	4	1	1	2	120
124058	Geodetics	3	2	0	1	60
124059	Engineering Geology	3	2	0	1	60
124060	Theoretical Mechanics	4	1	1	2	120
<b>TOTAL NUMBERS OF SEMESTER 1</b>		<b>19</b>	<b>10</b>	<b>2</b>	<b>7</b>	<b>450</b>
102003	Physical Education 2	0	0	0	0	30
102014	General computing { Word, Excel, PowerPoint, Internet }	3	2	1	0	75
124061	Soil Mechanics	3	3	0	0	45

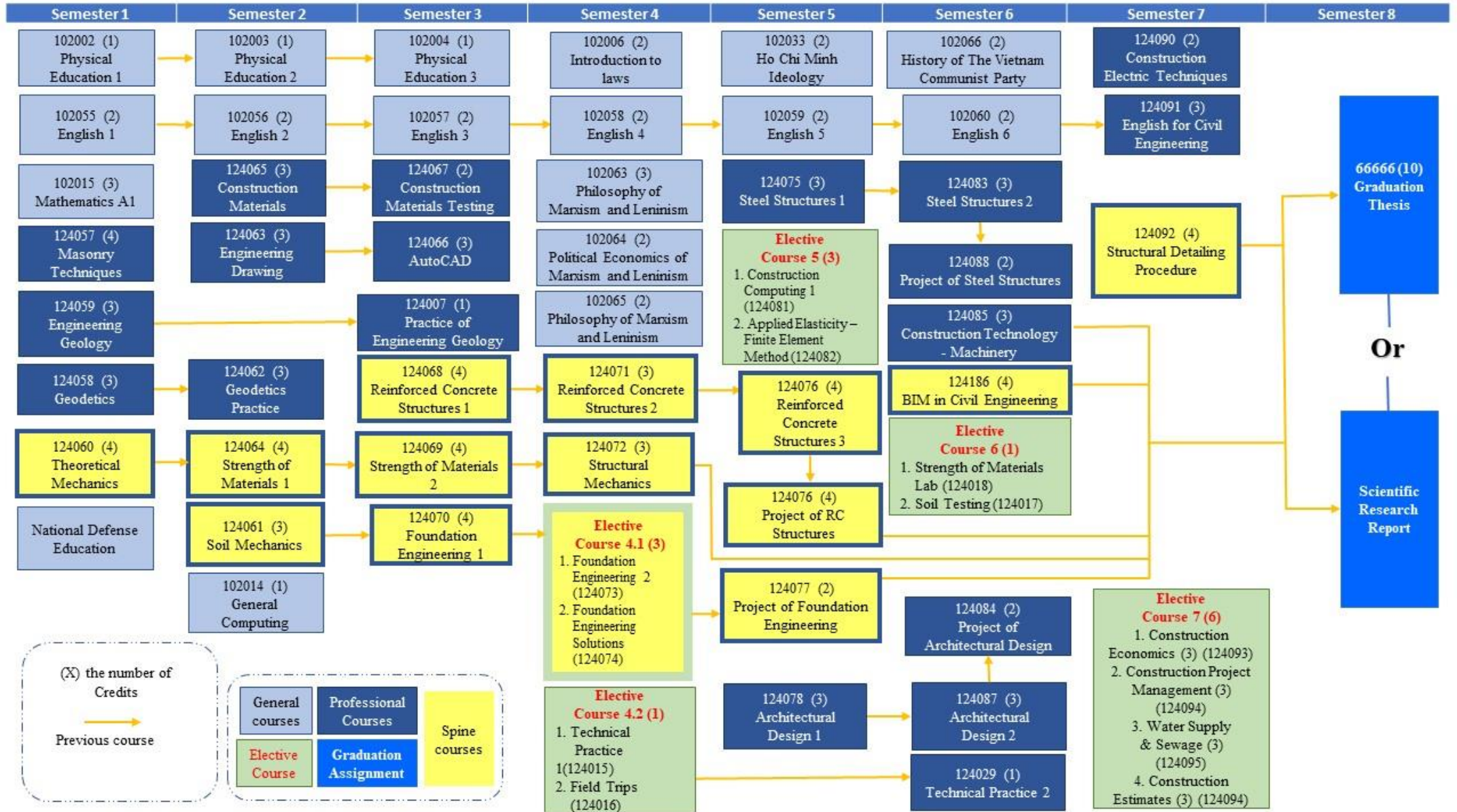


102056	English 2	2	1	0	1	45
124062	Geodetics Practice	3	0	1	2	105
124063	Engineering Drawing	3	3	0	0	45
124064	Strength of Materials 1	4	1	1	2	120
124065	Construction Materials	3	2	0	1	60
<b>TOTAL NUMBERS OF SEMESTER 2</b>		<b>21</b>	<b>12</b>	<b>3</b>	<b>6</b>	<b>495</b>
102004	Physical Education 3	0	0	0	0	30
102057	English 3	2	1	0	1	45
124007	Practice of Engineering Geology	1	1	0	0	15
124066	AutoCAD	3	1	1	1	90
124067	Construction Materials Testing	2	2	0	0	30
124068	Reinforced Concrete Structures 1	4	1	1	2	120
124069	Strength of Materials 2	3	1	1	1	90
124070	Foundation Engineering 1	4	1	1	2	120
<b>TOTAL NUMBERS OF SEMESTER 3</b>		<b>19</b>	<b>8</b>	<b>4</b>	<b>7</b>	<b>510</b>
102063	Philosophy of Marxism and Leninism	3	3	0	0	45
102064	Political Economics of Marxism and Leninism	2	2	0	0	30
102065	Scientific Socialism	2	2	0	0	30
102006	Introduction to Laws	2	2	0	0	30
102058	English 4	2	1	0	1	45
124071	Reinforced Concrete Structures 2	3	1	1	1	90
124072	Structural Mechanics	3	1	1	1	90
<b>Optional Course 4.1 (1 of the 2)</b>						
124073	Foundation Engineering 2	3	1	1	1	90
124074	Foundation Engineering Solutions					
<b>Optional Course 4.2 (1 of the 2)</b>						

124015	Technical Practice 1	1	0	0	1	30
124016	Field Trips					
<b>TOTAL NUMBERS OF SEMESTER 4</b>		<b>21</b>	<b>13</b>	<b>3</b>	<b>5</b>	<b>480</b>
102059	English 5	2	1	0	1	45
102033	Ho Chi Minh Ideology	2	2	0	0	30
124075	Steel Structures 1	3	1	1	1	90
124076	Reinforced Concrete Structures 3	4	1	1	2	120
124077	Project of Foundation Engineering	2	0	1	1	75
124078	Architectural Design 1	3	3	0	0	45
124079	Project of Reinforced Concrete Structures	2	0	1	1	75
<b>Optional Course (1 of the 2)</b>						
124081	Construction Computing 1	3	1	1	1	90
124082	Applied Elasticity – Finite Element Method					
<b>TOTAL NUMBERS OF SEMESTER 5</b>		<b>21</b>	<b>9</b>	<b>5</b>	<b>7</b>	<b>570</b>
102066	History of The Vietnam Communist Party	2	2	0	0	30
102060	English 6	2	1	0	1	45
124083	Steel Structures 2	3	3	0	0	45
124084	Project of Architectural Design	2	0	1	1	75
124029	Technical Practice 2	1	0	0	1	30
124085	Construction Technology - Machinery	3	2	0	1	60
124086	BIM in Civil Engineering	4	1	1	2	120
124087	Architectural Design 2	3	3	0	0	45
124088	Project of Steel Structures	2	0	1	1	75
<b>Optional Course (1 of the 2)</b>						
124017	Soil Mechanics Testing	1	0	0	1	30

124018	Strength of Materials Lab					
<b>TOTAL NUMBERS OF SEMESTER 6</b>		<b>23</b>	<b>12</b>	<b>3</b>	<b>8</b>	<b>555</b>
124089	Project of Building Construction	1	0	1	0	45
124090	Construction Electric Techniques	2	0	1	1	75
124091	English for Civil Engineering	3	3	0	0	45
124092	Structural Detailing Procedure	4	0	2	2	150
<b>Optional Course (2 of the 4)</b>						
124093	Construction Economics	3	3	0	0	45
124094	Construction Project Management	3	3	0	0	45
124095	Water Supply & Sewage	3	3	0	0	45
124096	Construction Estimates	3	3	0	0	45
<b>TOTAL NUMBERS OF SEMESTER 7</b>		<b>16</b>	<b>9</b>	<b>4</b>	<b>3</b>	<b>405</b>
66666	Graduation Thesis	10	10	0	0	150
<b>TOTAL NUMBERS OF SEMESTER 8</b>		<b>10</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>150</b>
<b>TOTAL NUMBERS OF THE CURRICULUM</b>		<b>150</b>	<b>83</b>	<b>24</b>	<b>43</b>	<b>3615</b>

### III. Flowchart



**IV. Mapping Courses – Programme learning outcomes (PLOs)**

**V. Mapping Course learning outcomes (CLOs) – Programme learning outcomes (PLOs)**

**VI. Mapping teaching and learning methods to PLOs**

**VII. Mapping assessment methods to PLOs**

**E. COURSE DESCRIPTION**

**124007 Practice of Engineering Geology**

Field internships aim to assess engineering geological conditions of an area by different engineering geological survey methods: visualization, drilling, penetration, compression, experimental water extraction.

**124015 Technical Practice 1**

Site preparation, masonry work (construction, painting, paving, paving, rolling base, ....), finishing work.

**124016 Field Trips**

Cognitive internship to create conditions for students: Integrate into the real environment of corporate agencies; Apply the knowledge learned to understand the actual work; Know how to behave in corporate relationships.

**124017 Soil Mechanics Testing**

The soil mechanics testing course aims to consolidate the knowledge learned in the soil mechanics course through experiments to determine the physical and mechanical properties of the soil.

**124018 Strength of Materials Lab**

Consolidate students' theoretical knowledge of strength of materials, improve practical skills, perform experiments on physical and mechanical properties of some solid objects and evaluate strength, hardness and stability.

**124029 Technical Practice 2**

Technical Practice 2 aims to help students grasp the reality of civil & industrial construction; apply learned theory into practice and learn and learn new techniques in construction technology. In addition, this module also helps students to be better prepared for the graduate labor period.

**124057 Masonry Techniques**

Provide students with economic - technical norms showing the cost of materials, labor and construction machines to complete a unit of construction work volume such as 1m<sup>3</sup> brick wall, 1m<sup>3</sup> concrete, 1m<sup>2</sup> tiled, 1 ton of reinforcement, 100m of pile length, etc. from preparation to finishing work.

**124058 Geodesics**

The main content of the module includes basic geodetic issues but necessary for construction such as: Positioning points, orienting straight lines, using maps, measuring angles, measuring length, measuring height, measuring and drawing. maps, topographic cross-sectional measurements,

types of work layout, as-built measurements, construction deformation monitoring.

### **124059 Engineering Geology**

Basic knowledge of construction soil, underground water. Phenomena, dynamic geological processes, engineering geological survey methods.

### **124060 Theoretical Mechanics**

Statics: Basic concepts and axioms of statics, reduction of force systems, equilibrium conditions of force systems, balance problems of solids - solid body systems, friction, center of gravity.

Kinematics: point kinematics, two fundamental motions of a solid, complex point motion, parallel plane motion of a solid, rotation around a fixed point, general motion of a solid. Modeling the kinematics.

Kinetics: particle dynamics, geometrical characteristics of the mass of the system, general theorems of system dynamics, D'Alembert's principle, principle of possible movement, Lagrange equation 2.

Mechanical majors: Civil Engineering, Mechanical Engineering, Traffic Engineering, Geotechnical and Petroleum Engineering.

### **124061 Soil Mechanics**

Including: Soil formation, soil composition phases, soil physical characteristics; mechanical and related properties. Stress distribution in the soil, problems with deformation, bearing capacity of the ground, stability of soil mass and earth pressure on solid bodies.

### **124062 Geodetics Practice**

Use theodolites and nitrous to measure the fundamentals; measure equal angle, measure vertical angle, measure length by distance and vertical mix, trigonometric altimeter, geometric altimeter.

### **124063 Engineering Drawing**

This subject equips students with spatial thinking ability; skills in using common drawing tools as well as software and automatic drawing equipment, in order to represent and read technical ideas on drawings, in accordance with International (ISO) and Vietnamese standards (TCVN).

### **124064 Strength of Materials 1**

- Basic concepts of stress and stress in payment problems.
- Single and complex stress states in bars.
- Durability theories.
- features required when calculating payments.
- Problems of bars subjected to torsion and planar bending
- Stabilize the compression bar.

### **124065 Construction Materials**

The main mechanical and mechanical properties of building materials used for construction works.

Main technical features of common building materials used for construction works such as natural stone materials, construction ceramic materials, inorganic binders (construction plaster, Portland

cement), cement concrete, construction mortar ...

### **124066 AutoCAD**

Equip with basic knowledge on how to present drawings and present design drawings in the most correct and fastest way. Main content of the course: Basic drawing commands, model editing, showing dimensions on drawings, printing drawings, ...

### **124067 Construction Materials Testing**

Consolidate theoretical knowledge of building materials, improve practical skills, perform experiments on physical and mechanical properties of some basic building materials such as: fired clay bricks, sand stone, cement, concrete.

### **124068 Reinforced Concrete Structures 1**

This course aims to analyze the main physical and mechanical properties of concrete, calculate the structural cross section and the required amount of reinforcement; rationally arrange reinforcement in sections when subjected to simple stress states; bending, pulling, compressing, eccentric pulling, eccentric compression. The calculation follows two limit states and is a mandatory basis for studying the calculation of house structures later.

### **124069 Strength of Materials 2**

- Complex bearing bars.
- Stabilize the straight bar under centered compression.
- Calculating the displacement of the bar system
- Calculate the planar super static system by force method.
- Load.

### **124070 Foundation Engineering 1**

Principles, foundation design process and rules and design order of shallow foundations: single foundation, tape foundation, raft foundation.

### **124071 Reinforced Concrete Structures 2**

- Reinforced concrete: Mainly calculates parts of reinforced concrete building structures including floors, frame structures, beams, foundations, roofs and 1-storey industrial buildings. At the end of this course, students can design small, medium and solid works by themselves.
- Brick and stone: This section will briefly introduce the mechanical and mechanical properties of brick and stone masonry with or without reinforcement; how to calculate those masonries with different stress states.

### **124072 Structural Mechanics**

Static flat bar system:

- Analyze geometrical structure.
- Analysis of internal forces of mobile and stationary load-bearing systems.
- Space system concept.
- Determination of displacement in a linear convergent plane bar system.
- Concept of superstatic system, superstatic order.

- Force method and calculation of the superstatic flat bar system.
- Transposition method for flat bar system.

### **124073 Foundation Engineering 2**

Principles, processes, design rules for special types of foundations; deep foundation: pile foundation, bored pile foundation, barrette pile foundation, pipe pillar foundation; The foundation is subjected to horizontal loads and the foundation is subjected to dynamic loads.

Calculation of building foundations on soft soil.

### **124074 Foundation Engineering Solutions**

Help students master theoretical and semi-experimental principles to rationally design basic foundations to apply to different conditions of the ground under constructions; Particularly about the ground, students understand how to calculate problems related to the durability, stability and deformation of the ground.

### **124075 Steel Structures 1**

Calculation and design of simple structural steel or wood and plastics. Consists of 2 parts:

- Steel structure: can calculate the types of connections, design beams, columns, trusses in the form of shapes or combinations.
- Wood structure: calculate the connections, choose the cross section of the structure using wood or soft links and some other types of load-bearing wood structures.

### **124076 Reinforced Concrete Structures 3**

- Calculation of special reinforced concrete structures including: earth retaining walls, liquid storage tanks of all kinds, silos, bunkers and space roofs.
- Analyze internal forces in complex structural forms and grasp calculation techniques, reinforcement structures in those structures to apply in their professional practice in the long term.

### **124077 Project of Foundation Engineering**

Apply the knowledge learned in the modules Soil Mechanics, Foundations and Foundations to design calculations for common foundations.

### **124078 Architectural Design 1**

Civil architecture.

Architectural design bases: implementation sequence, architectural layout, functional space; the economic - technical characteristics when designing civil works such as houses, apartments, working houses, hotels, public works, special works ... will be the basic contents of the subject. study this.

### **124079 Project of Reinforced Concrete Structures**

- Apply the knowledge learned in the subject of reinforced concrete structures on calculation and structure of flexural members to design a specific structure.
- Perform relatively complete calculation of the working floor using BTC. Including the determination of load types, determination of internal forces, combination and selection of reinforcement; Arrange reinforcement for structural members of floor - beams in 1 of 2 options: 1-way or 2 -way working plate.



### **124081 Construction Computing 1**

Guide students to analyze and practice using SAP - 2000 software according to the current versions widely used in the field of study today.

### **124082 Applied Elasticity – Finite Element Method**

This course helps students learn about a modern structural calculation method in the construction industry, understand the nature of structural analysis when using structural calculation software programmed according to the method. Finite elements are widely used today.

### **124083 Steel Structures 2**

Calculation of special steel structures including: Industrial building frames, prestressed steel structures, large span buildings, pylons and slab steel structures.

Analyzing the internal forces of complex structural forms in order to have initial skills to study in-depth and know the structures and connections of steel structures in difficult cases.

### **124084 Project of Architectural Design**

Through civil architecture, students when implementing this project will be able to choose one of the civil or public works such as apartments, offices, hotels, exhibition halls, libraries, post offices... to design specific architecture for a first work; including the planning of the total ground, floor plans, cross-sections, cross-sections in all directions. This is one of the 3 compulsory projects for construction majors.

### **124085 Construction Technology - Machinery**

– Construction techniques: basic knowledge about construction methods of civil and industrial works, including main contents: construction of earthworks, construction of formwork, reinforcement, concrete. Construction work of components in the project and construction and finishing work.

– Construction machines: Basic knowledge about the characteristics and general structure of construction machines; structure, technical features, exploitation and use, simple calculation ... of machines commonly used in basic construction such as lifting machines, machines

– Earthworks, foundation reinforcement equipment, construction material production machines and construction machinery mining.

### **124086 BIM in Civil Engineering**

Learn about BIM (Building Information Modeling) to create and use information models in the design, construction and operation phases of a project. Some specific applications of BIM construction information model for construction companies today are:

- Architectural design: from the ideation stage, energy analysis of the building.
- Structural design: make design plans, analyze structural diagrams.
- Electromechanical design: plan design, optimize design (collision reduction, altitude assurance, performance analysis)
- Shop drawing drawings, statistics
- Simulation of construction and erection sequence
- Component fabrication service

- Managing the total premises, assessing the feasibility of the construction site, labor safety
- Virtual Reality, Augmented Reality, 3D Printing, 3D Scanning

### **124087 Architectural Design 2**

Industrial architecture; architecture of single-storey, multi-storey industrial houses and types. Consists of 2 parts:

- \* Principles of industrial house design.
- \* Principles of industrial building components (roof, floor, positioning shaft, crane ...).

### **124088 Project of Steel Structures**

Students will perform a relatively complete calculation of a steel structure, usually a steel single-storey industrial building with a crane, including determining load types, determining internal forces, combinations and selecting cross-sections for those structural parts.

### **124089 Project of Building Construction**

Project of Building Construction consists of 2 parts:

Part 1: Preparation of technical measures: Students must be able to state construction techniques with a predetermined type of work (whole block or assembly). Including support measures, formwork structure and concrete pouring or assembly of a reinforced concrete or steel building for civil or industrial buildings.

Part 2: Organizing: Students must plan the total construction site plan, make construction progress (line diagram, network diagram) with calculation of technical coefficients.

### **124090 Construction Electric Techniques**

The course equips students with the general problems of calculating and designing power supply systems for construction works. The program also introduces students to some concepts about:

- Lightning protection system
- Communication system (communication system)
- Security system (security system)
- Fire protection system
- Elevator electrical system (electrification for elevator)
- Central air conditioning system and electric water pump system.
- TV antenna system (master antenna)

### **124091 English for Civil Engineering**

Including the vocabulary of construction industry such as jobs, subcontractors, trades, materials, equipment, warning signs, problems on site...

### **124092 Structural Detailing Procedure**

Redraw some drawings as required from the architectural design file of a project (apartment, office building, school, hospital, ...) or a new item of the work that has been appraised.

Calculate floor structure, longitudinal beams, stairs, lake (existing or assumed), frame (flat or spatial). Calculating and designing foundation solutions (single, tape, raft; pressed piles, bored drilling ...) to choose the optimal solution for implementation.

- Proficient in using software: AutoCAD, Sap-2000, Microsoft Project 2003, ... to design, draw, calculate, statistics, ... to meet industry standards on architecture, construction structure, items

to be implemented through the project.

- Construction can be done as soon as the project or work item is implemented.

### **124093 Construction Economics**

Economic management and organization of production and business in the construction industry. Dive into the management and use of investment capital, evaluate the economic efficiency of investment capital, thereby offering the best investment projects and managing project implementation. Determination of economic and technical criteria in design and construction. Proposing measures to reduce construction costs on the basis of analyzing economic activities of construction companies.

### **124094 Construction Project Management**

Help students understand the process and implementation sequence of construction investment project management, progress management, project quality and safety, cost and material management, payment decision. project contract payment, investment capital settlement...

### **124095 Water Supply & Sewage**

Introduction to water supply and sewage problems outside and inside the house. The water supply section will cover the types of water sources and water treatment schemes, the water supply system for the area and for the construction site as well as the indoor water supply system; in which emphasis will be placed on the calculation and design of the water supply network. The sewage section will cover the main issues of regional and indoor drainage and wastewater treatment methods.

### **124096 Construction Estimates**

Help students get acquainted with professional work, practice students familiarize themselves with the work of building bowls and formwork at the internship workshop at the school.

- Directly involved in construction work.
- Practice the finishing work of smoothing, cladding, painting....

**DEAN**

**RECTOR**