MINISTRY OF EDUCATION AND TRAINING

LAC HONG UNIVERSITY

POSTGRADUATE PROGRAMME SPECIFICATION

Field of Study:	**CIVIL ENGINEERING**
Program Code:	**8580201**
Level of Training:	**Master's Degree**
Applicable Cohort:	**2024**

Dong Nai, 2023

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MINISTRY OF EDUCATION
AND TRAINING
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SOCIALIST REPUBLIC OF VIETNAM
Independence – Freedom – Happiness

POSTGRADUATE TRAINING PROGRAM

A. INTRODUCTION

The Master's program in Civil Engineering is designed to equip learners with advanced knowledge and practical skills in the construction field. It aims to enhance learners' abilities in technical evaluation, innovative problem-solving, and coordination in complex construction projects, while fostering leadership, critical thinking, and professional ethics. Oriented toward application, this program is well-suited for engineers, professionals, and managers seeking to deepen their expertise and contribute effectively to the modern construction industry.

B. STRUCTURE AND CONTENT OF PROGRAMME

Field of Study: **Civil Engineering**

Program Code: **8580201**

Level of Training: **Master's Degree**

Applicable Cohort**: 2024**

(Issued together with Decision No. .../QD-ĐHLH, day ... month ... year ... by the Rector of Lac Hong University)

1. Training duration: 24 months

2. Admission requirements

- Graduated from or eligible for graduation from a bachelor's program (or higher) in a relevant field as listed in Table 1. In cases outside those fields, supplemental coursework covering the topics in Table 2 of the corresponding undergraduate curriculum at Lac Hong University is required.

- Foreign language proficiency at Level 3 under Vietnam's Six-Level Foreign Language Proficiency Framework or equivalent.

3. List of relevant fields

Table 1. *List of Relevant Fields*

No.	Program Code	Relevant Field Name
1	7580201	Civil Engineering
2	7580202	Hydraulic Engineering / Water Resources Engineering
3	7580203	Offshore Engineering / Coastal and Offshore Structures Engineering
4	7580205	Transportation Engineering / Civil Transportation Engineering
5	7580210	Infrastructure Engineering
6	7580211	Geotechnical Engineering

No.	Program Code	Relevant Field Name
7	7510101	Architectural Engineering Technology
8	7510102	Construction Engineering Technology
9	7510103	Civil Engineering Technology
10	7510104	Transportation Engineering Technology
11	7510105	Building Materials Engineering Technology

For applicants holding a bachelor's degree in other fields, they must complete three supplementary modules (10 credits) listed in Table 2. The exact number of courses is determined based on the undergraduate transcript, with each module carrying at least 2 credits.

Table 2. *Supplementary Knowledge Modules*

Names of Supplementary Knowledge Modules	Credits
1. Reinforced Concrete Structures II	2
2. Reinforced Concrete Structures III	2
3. Steel Structures II	2
4. Construction Computing 2	2
5. Construction on Soft Ground	2

4. Programme Objectives and Learning Outcomes

4.1. Programme educational objectives-PEOs

Graduates of the Master of Civil programme, within 3–5 years after graduation, are expected to

PEOs	Educational Objective
PEO1	Develop advanced technical competencies and the application of cutting-edge technologies in the field of Construction Engineering
PEO2	Enhance leadership skills and the ability for self-directed learning

4.2. Program learning outcomes – PLOs

Using Bloom's taxonomy across Knowledge, Skills, and Attitudes, each PLO statement begins with an action verb reflecting the expected competency level.

Learning Outcome		PEO1	PEO2
PLO1	Evaluate technical solutions in construction design and execution processes, complying with international and Vietnamese standards.	✓	
PLO2	Create innovative solutions for complex construction projects.	✓	

PLO3	Coordinate resources and teams in complex construction projects.	✓	✓
PLO4	Demonstrate social responsibility, professional ethics, and commitment to lifelong learning.		✓

5. Structure and Curriculum

5.1. Structure

General Knowledge (7 credits)		**Foundation Knowledge (12 credits)**		**Major Knowledge (26 credits)**		**Thesis (15 credits)**
7 credits	➡	Compulsory **6** credits Elective **6** credits	➡	Compulsory **20** credits Elective **6** credits	➡	**15** credits

5.2. Curriculum

No.	Course Code	Course Name	Number of Credits		
			Total	**Theory**	**Practical/ Lab/ Discussion**
I	**General Knowledge**		**7**	**7**	**0**
1	900802	Philosophy	2	1	0
2	900804	English	4	0	0
II	**Foundation Knowledge**		**12**	**8**	**4**
	Compulsory		**6**	4	2
3	942801	Finite Element Method	3	2	1
4	942802	Advanced soil mechanics	3	2	1
	Elective (Select 2 out of 4)		**6**	**4**	**2**
5	942819	Mechanics of Deformable Solids	3	2	1
6	942820	Advanced Structural Mechanics	3	2	1
7	942806	Dynamics of structures	3	2	1
8	942804	Wind Effects and Seismic Design of Building Structures	3	2	1
III	**Major Knowledge**		**26**	**19**	**7**
	Compulsory		**20**	**15**	**5**
9	942807	Methodology of scientific research	2	1	1
10	942808	Advanced reinforced concrete structures	4	3	1
11	942809	Advanced Foundation Engineering	4	3	1
12	942810	Steel-concrete composite structures	3	3	0
13	942811	Advanced steel structures	4	3	1
14	942813	Prestressed concrete structures	3	2	1
	Elective (Select 2 out of 4)		**6**	**4**	**2**
15	942812	Shell Structures	3	2	1

No.	Course Code	Course Name	Number of Credits		
			Total	Theory	Practical/ Lab/ Discussion
16	942821	Selected Topics	3	2	1
17	942817	Construction deformation monitoring	3	2	1
18	942818	Management & Appraisal of Construction Projects	3	2	1
IV	**Graduation**		**15**	**0**	**15**
19	942700	Thesis of master	15	0	15
Total			**60**	**34**	**26**

6. Mapping CLOs to PLOs

Course	PLOs			
	PLO1	**PLO2**	**PLO3**	**PLO4**
Philosophy				CLO1, CLO2
English				CLO1, CLO2
Finite Element Method	CLO1	CLO2		
Advanced soil mechanics	CLO1		CLO2	
Mechanics of Deformable Solids	CLO1	CLO2		
Advanced Structural Mechanics		CLO1	CLO2	
Dynamics of structures	CLO1	CLO2		
Wind Effects and Seismic Design of Building Structures		CLO1	CLO2	
Methodology of scientific research			CLO1	CLO2
Advanced reinforced concrete structures	CLO1	CLO2		
Advanced Foundation Engineering	CLO1		CLO2	
Steel-concrete composite structures			CLO1	CLO2
Advanced steel structures	CLO1	CLO2		
Prestressed concrete structures	CLO1		CLO2	
Shell Structures		CLO1		CLO2
Selected Topics			CLO1	CLO2
Construction deformation monitoring		CLO1		CLO2
Management & Appraisal of Construction Projects			CLO1	CLO2
Thesis of master	CLO1	CLO2		CLO3

7. Teaching Methods

7.1. Mapping Teaching Methods to PLOs

Code	Teaching Methods	PLO1	PLO2	PLO3	PLO4
T1	Project-Based Learning		X	X	
T2	Case Study Analysis		X		X
T3	Blended Learning	X			X
T4	Brainstorming	X		X	
T5	Field Work			X	X
T6	Role-Playing and Scenario-Based Learning	X	X		
T7	Report			X	X

7.2. Mapping Modules to Teaching Methods

Course	Teaching Methods						
	T1	T2	T3	T4	T5	T6	T7
Philosophy		X				X	
English			X	X			
Finite Element Method	X					X	
Advanced soil mechanics		X			X		
Mechanics of Deformable Solids						X	X
Advanced Structural Mechanics	X		X				
Dynamics of structures		X			X		
Wind Effects and Seismic Design of Building Structures				X			X
Methodology of scientific research			X				X
Advanced reinforced concrete structures				X			X
Advanced Foundation Engineering	X	X					
Steel-concrete composite structures				X		X	
Advanced steel structures				X		X	
Prestressed concrete structures			X			X	
Shell Structures		X			X		
Selected Topics	X				X		
Construction deformation monitoring	X	X					
Management & Appraisal of Construction Projects			X		X		
Thesis of master	X		X	X	X		X

8. Assessment Methods

8.1. Mapping Assessment Methods to PLOs

Code	Assessment methods	PLO1	PLO2	PLO3	PLO4
A1	Project Reports		X	X	
A2	Written exams and essays	X			X
A3	Presentations	X	X		
A4	Group Evaluation			X	X
A5	Interviews and Scenario Evaluations			X	X

8.2. Mapping Course to Assessment Methods

Course	Assessment methods				
	A1	**A2**	**A3**	**A4**	**A5**
Philosophy		X			
English		X			
Finite Element Method		X		X	
Advanced soil mechanics		X			X
Mechanics of Deformable Solids				X	
Advanced Structural Mechanics	X		X		
Dynamics of structures		X			X
Wind Effects and Seismic Design of Building Structures	X			X	
Methodology of scientific research			X		X
Advanced reinforced concrete structures				X	
Advanced Foundation Engineering	X	X			
Steel-concrete composite structures				X	
Advanced steel structures				X	
Prestressed concrete structures	x		X		
Shell Structures		X			X
Selected Topics	X				X
Construction deformation monitoring	X		X		
Management & Appraisal of Construction Projects			X		X
Thesis of master			X	X	X

9. Thesis Defense Requirements

a) Has completed all courses in the training program and achieved a cumulative course average of at least 5.5 out of 10;

b) Has submitted the thesis defense registration dossier by the deadline announced by the Faculty of Postgraduate Studies;

c) Has no complaints or allegations regarding the scientific content of the thesis at the time of review;

d) Meets the master's thesis formatting and presentation requirements as stipulated by the University;

e) Has fulfilled all tuition fee obligations as required by the University.

10. Graduation Requirements

a) Has completed all required coursework of the training program and successfully defended the thesis;

b) Has submitted to the Faculty of Postgraduate Studies an electronic copy of the fully revised thesis for use as reference material in the library and for archival purposes;

c) Has submitted a bound hard copy of the thesis, together with a revision report detailing changes made according to the committee's feedback, certified by the supervisor and the Committee Chair as compliant with the committee's conclusions;

d) Has met the foreign language proficiency requirement specified by the program's exit standards prior to graduation review, evidenced by one of the following: A diploma or certificate at a level equivalent to Level 4 of the Vietnamese 6-level Foreign Language Proficiency Framework, or another equivalent certificate recognized by the Ministry of Education and Training; A bachelor's degree or higher in a foreign language; A bachelor's degree or higher in another field in which the entire program was conducted in a foreign language.

11. Graduate Career Opportunities

Upon graduation, students will be capable of:

- Serving in enterprise leadership or technical roles (e.g., CTO, CIO, CEO, Senior Engineer, etc.);
- Conducting research in research & development departments;
- Developing plans and project proposals, and organizing, directing, and managing IT projects in organizations and enterprises;
- Performing effectively in R&D roles;
- Teaching at universities specializing in Information Technology;

C. COURSE DESCRIPTION

900802 PHILOSOPHY

Foster philosophical thinking and understanding of Vietnam's science and technology development strategy

900803 ENGLISH

Enhance foreign language proficiency for scientific research activities.

942801 FINITE ELEMENT METHOD

Equip learners with in-depth knowledge and skills in the Finite Element Method (FEM) to solve engineering problems and conduct research in the fields of structures, mechanics, thermal analysis, and design optimization, while becoming proficient in using modern analysis tools and software

942802 ADVANCED SOIL MECHANICS

Equip learners with advanced knowledge and skills in Soil Mechanics to analyze, evaluate, and solve complex problems related to soil mechanical properties, foundation behavior, and structural stability, while applying modern computational methods and specialized software in practical applications.

942819 MECHANICS OF DEFORMABLE SOLIDS

Equip learners with extensive knowledge of solid mechanics, including principles and theories of stress, strain, equilibrium, and stability of solids under load. The course develops the ability to analyze the behavior of materials and structures under various working conditions, and apply this understanding to practical structural analysis, design, and optimization.

942820 ADVANCED STRUCTURAL MECHANICS

Provide learners with advanced knowledge of Structural Mechanics, focusing on the analysis of structures under static and dynamic loads considering material and structural plasticity. The course enables learners to master nonlinear theory, assess structural behavior in both elastic and plastic stages, and apply this knowledge to the design, analysis, and optimization of structures with consideration of ultimate load capacity and plastic deformation in practice.

942806 DYNAMICS OF STRUCTURES

Equip learners with advanced knowledge of Structural Dynamics, including principles and methods for analyzing structures subjected to dynamic loads such as wind, earthquakes, forced, and random vibrations. The course develops skills in modeling, computing, and evaluating the dynamic response of structures, while applying numerical methods and modern software in the analysis and design of structures under dynamic loading.

942804 WIND EFFECTS AND SEISMIC DESIGN OF BUILDING STRUCTURES

Provide learners with in-depth knowledge of wind effects and seismic design, including the analysis of structural responses to wind and earthquake loads. The course enables learners to master the principles and standards of seismic design, evaluate the dynamic behavior of structures, and apply modern computational methods to design and optimize buildings subjected to wind and seismic actions in practical applications.

942807 METHODOLOGY OF SCIENTIFIC RESEARCH

Equip learners with knowledge and skills in Scientific Research Methodology, including the steps of formulating, conducting, and evaluating a research project. The course fosters scientific thinking, analytical and synthesis abilities, and the capacity to present research findings in a logical, systematic, and academically appropriate manner.

942808 ADVANCED REINFORCED CONCRETE STRUCTURES

Provide learners with advanced knowledge of Reinforced Concrete Structures, including principles, theories, and calculation methods for reinforced concrete structures under complex working conditions. The course enables learners to analyze, design, and assess reinforced concrete structures subjected to static, dynamic, nonlinear loads, and ultimate states, thereby applying these skills in real-world construction to ensure safety and optimize structural design.

942809 ADVANCED FOUNDATION ENGINEERING

Equip learners with advanced knowledge of Foundation Engineering, including principles, analysis methods, and foundation design under complex geological conditions and high loading demands. The course enables learners to evaluate bearing capacity, settlement, and stability of foundations, select appropriate solutions for soft soil treatment, and apply modern computational methods to real-world construction practices.

942810 STEEL-CONCRETE COMPOSITE STRUCTURES

Equip learners with in-depth knowledge of Steel–Concrete Composite Structures, including working principles, analysis methods, and design techniques for composite members in construction projects. The course enables learners to master the load-bearing capacity, deformation behavior, and stability of composite structures, thereby applying these concepts to design, calculation, and optimization of practical structures to ensure safety and economic efficiency.

942811 ADVANCED STEEL STRUCTURES

Equip learners with advanced knowledge of Steel Structures, including principles, theories, and methods for analyzing and designing structural steel components and systems under static, dynamic, and nonlinear loads. The course develops learners' skills in calculating, evaluating stability, load-bearing capacity, and designing complex steel structures, thereby applying these competencies to the effective and safe construction of civil and industrial buildings.

942813 PRESTRESSED CONCRETE STRUCTURES

Equip learners with in-depth knowledge of Prestressed Concrete Structures, including working principles, design methods, and construction techniques of prestressed concrete. The course enables learners to master the load-bearing capacity, deformation behavior, and performance of prestressed concrete structures, thereby applying this knowledge to the analysis, design, and optimization of bridges, slabs, and special structures to ensure economic efficiency and safety in practice.

942812 SHELL STRUCTURES

Equip learners with advanced knowledge of Plate and Shell Structures, including fundamental principles, analytical theories, and computational methods for analyzing the behavior of flat plates and curved shells under static and dynamic loads. The course helps learners develop modeling skills, and analyze stress, deformation, and stability of plate and shell structures, thereby applying this knowledge to the design and optimization of engineering structures in practice.

942821 SELECTED TOPICS

Equip learners with the ability to independently select and conduct in-depth research on a specific topic in the field of construction engineering or structural engineering, based on personal interests or practical demands. The course fosters independent thinking, and develops analytical, synthesis, and problem-solving skills to address complex technical issues, serving as a foundation for practical application or further advanced research.

942817 CONSTRUCTION DEFORMATION MONITORING

Equip learners with advanced knowledge of Structural Deformation Monitoring, including modern methods, technologies, and techniques for monitoring settlement, tilting, displacement, and deformation of structures during construction and operation. The course develops learners' skills in analyzing and processing monitoring data and assessing the safety and stability of structures, thereby enabling them to propose appropriate technical solutions in practice

942818 MANAGEMENT & APPRAISAL OF CONSTRUCTION PROJECTS

Equip learners with in-depth knowledge and skills in Construction Project Management and Appraisal, including principles, methods, and tools for effectively managing all phases of a construction project—from planning, implementation, and control to performance evaluation. The course develops learners' ability to assess the technical, financial, legal, and feasibility aspects of projects, thereby enhancing their capacity for management and decision-making in real-world construction practice.

942700 THESIS OF MASTER

Equip learners with independent and in-depth research skills through the implementation of the Master's Thesis. The thesis enables learners to apply theoretical and practical knowledge to solve a specific scientific or technical problem, while developing critical thinking, analytical, synthesis, and academic presentation skills in accordance with scholarly standards.

DEAN **RECTOR**