



COURSE: DESIGN OF STRUCTURAL SYSTEMS

Course code: CVEG 4169

1. **Number of credits:** 3 (3-0-0)
2. **Number of periods:** Total: 45 periods
3. **Applied for the training program:**
 - *Elective courses for majors: Civil Engineering (including majors: Construction, Transport, Geotechnical, Hydro-Construction, Construction Management, Environment, Water Resources Engineering).*

4. Evaluations:

Items	Time s	Description	Time	Grading system
Homework/ InClass and Class Attendance	1	Based on the number of class attendance, combine the assessment of the sense of learning and the spirit of class participation. There are 8 homework and in class exercises.	The whole learning process	20%
Exam 1 and exam 2	2	- Exam 1: After finishing: Design the structural elements; 90 minutes - Exam 2: After finishing: Load determination (LL, WL, EL); 90 minutes	Week 7 & Week 14	2x25% =50%
Final Presentation	1	- Student groups are assigned major assignments from week 8; Present and defend the results of at final presentation. - Group defense time: 30 minutes/group. Format: Q&A.	1-2 weeks after the end of the course	30%

5. Course binding conditions:

- CVEG 4118: Reinforced Concrete Design I

6. Course summary content

This course is intended to provide the civil engineering students with the tools required to design a multistory reinforced concrete structures. The course will also provide the student with a basic understanding of structural design software.

Topics:

Reinforced Concrete, Building structural systems;

Preliminary design;

Loads- DL, LL, WL, EL;

Analysis- Frames- Model & use of computer program (Etabs software)

Design of structural elements: Slab, Beam & Columns

Detailing Reinforcement

7. Teaching Staffs:

No	Full name	Degree	Mobile phone	Email	Position title
1	Nguyen Thi Thanh Thuy	MSc	0986.922.668	thuynt@tlu.edu.vn	Lecturer
2	Nguyen Ngoc Thang	Dr	0912.640.081	thangnn@tlu.edu.vn	Deputy head of division
3	Doan Xuan Quy	MSc	0904.862.686	quydx@tlu.edu.vn	Lecturer

8. Textbook and reference materials:

- Textbooks:

1. Nilson, Darwin, and Dolan, McGraw Hill, **Design of Concrete Structures, 14th Edition**, 2004
2. **ASCE Standard: ASCE 7-10; ASCE Minimum Design Loads for Buildings and Other Structures**, ASCE, New York, 2010

- References:

1. Mehta, K.C., et. al., **Guide to the use of the Wind Load Provisions of ASCE 7-02**, ASCE, New York, 2004
2. **Building Code and Commentary (ACI 318-08)**, 2008, The American Concrete Institute, Detroit, MI.
3. **Simplified Design: Reinforced Concrete Buildings of Moderate Size and Height, Third Edition** (Alsamsam and Kamara, Portland Cement Association, 2004)

9. Course Detailing Schedule:

Class	Content (3 periods)
<u>Week 1</u>	Introduction to course syllabus Background. Structural Analysis and Design Assign HW#1 (beam), HW#3(slab), HW#4(column)
<u>Week 2</u>	Beam design and details. Review HW#1
<u>Week 3</u>	Preliminary Design. Assign HW #2
<u>Week 4</u>	Slab design and Details. HW#3
<u>Week 5</u>	Priliminary design, Beam and Slab review
<u>Week 6</u>	Sway and No sway Column Design. Review HW#4;
<u>Week 7</u>	Review and Exam 1
<u>Week 8</u>	Structural systems, Loads, Analysis and Detail design. (types of slab + student presentation + give the Major Assignment)
<u>Week 9</u>	Introduction to Structural Analysis Program. Assign HW#5 <i>(learn in computer lab; need to bring laptop with Etabs software)</i>
<u>Week 10</u>	Live load Reduction. Inclass and HW#6 (theory+ example+ Inclass quiz+ do calculation with excel) <i>(learn in computer lab)</i>
<u>Week 11</u>	Checking process and guide the assignment for Final Presentation. (Preliminary design and slab design)
<u>Week 12</u>	Wind load. Inclass and HW #7: Wind Load calculation in Major assignment (theory+example)
<u>Week 13</u>	Earthquake load. Inclass and HW#8 Earthquake Load calculation in Major assignment
<u>Week 14</u>	Review and Exam 2
<u>Week 15</u>	Guide to Final Presentation and Calculation Report
<u>Week 16</u>	Compensated week
1-2 weeks after the end of the course	Final exam (Form: Presentation / Q&A)

10. Course learning outcomes

No.	Course expected learning outcomes	Learning outcomes of the respective training program ⁽¹⁾
Knowledge		
1	✓ Students understand and apply generic knowledge (mathematics, physics, chemistry, information technology-IT) in calculation, simulation, analysis and synthesis of a number of specialized technical issues.	1
2	✓ Students understand and apply the basic principles of CE to explain phenomena, identify the factors / the effects of loads on structures and analyses the response of structures under impacts.	2
3	✓ Students understand the methods, process of design, planning and calculation to determine the basic parameters of construction, construction systems such as: civil engineering.	3
4	✓ Students understand major practical knowledge related to the job of engineers including ethics, professionalism, the environment, social and political issues, globalization, contract documents and other legal issues.	5
Skills / abilities		
5	✓ Students have ability to use English effectively in communication, study, work, and research, standardized according to AP of TLU, minimum 500 TOEFL or equivalent.	6
6	✓ Students have ability to write report, deliver a speech, discuss and negotiate.	7
7	✓ Students have ability to use effectively up-to-date tools and modern technology (Microsoft Office, CAD, Excel) in their learning and job	8
8	✓ Students have ability to apply effectively specialized software (SAP / ETABS) to solve professional problems.	9
9	✓ Students have ability to work independently and organize group work	10

10	✓ Students aware of necessity and have ability to engage in life-long learning	11
11	✓ Students have ability to identify, formulate and solve CE problems	12
12	✓ Students have skills to analyze, gather and process information and data related to specialized subjects	13
13	✓ Students have skills to calculate, design, construct (at the basic level) the projects related to civil engineering.	14
Virtue		
14	✓ Students have morality, professional ethic, sense of discipline and responsibility for job, community and society.	16

⁽¹⁾ The learning outcomes of the respective training program are recommended by the Head of the training faculty.

11. Civil and Industrial Construction Division contact information

A. Division's address: Room 420 –A1 Building, Thuyloi University

B. Head of division: (Responsible for answering questions from students and stakeholders)

- Full name: Assoc. Prof Nguyen Anh Dung

- Mobile phone: 0968.906.625

- Email: dung.kcct@tlu.edu.vn

Hanoi, 01/08/2021

TRƯỞNG KHOA

*(In charge of
educational training)*

DEAN OF FACULTY

(In charge of course)

HEAD OF DIVISION

Assoc. Prof. Nguyen Huu Hue Assoc. Prof. Nguyen Anh Dung

