THUYLOI UNIVERSITY
FACULTY OF CIVIL ENGINEERING
CIVIL AND INDUSTRIAL CONSTRUCTION DIVISION

COURSE OUTLINES
Education level: Undergraduate

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	Times	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 sofware)

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

10. Course learing 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: Associ. Prof Nguyen Anh Dung
- Mobile phone: 0968.906.625
- Email: dung.kcct@tlu.edu.vn

Hanoi, 01/08/ 2021

TRƯỞNG KHOA	**DEAN OF FACULTY**	**HEAD OF DIVISION**
(In charge of edicational training)	*(Incharge of course)*	
Associ.Prof. Nguyen Huu Hue	***Associ.Prof. Nguyen Anh Dung***	