Theory of Structure in Architecture 1

Course Name	Course section (credit/hours)	Required course(3/3)		course code	E025
	course item			course component	
	Target students Division/major/grade			opening semester	2021 1ST SEMESTER
	Class time and classroom	Tue E(IUC827)Thu D(IUC827)		English Grade	A(100%English)
Reference to this course	Credit compositon	Theory(3) + Design(0) + Practice(0)			
	Prerequisite courses	수학1			
	Related basic courses	수학1			
	Recommanded concurrent courses	건축구조			
	Related advanced course	Theory of Structure in Architecture 2			

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1. Course Introduction

Theory of Structure in Architecture 1 is one of the most important courses in the Architectural Engineering as a basis of all other analysis courses available in the department of Architectural Engineering. This course will provide the students with the basic knowledge to deal with a variety of structural problems in the structural engineering field. In addition, problems and examples in this class can be used at a later time to prepare for the exam necessary to obtain a professional engineering license.
Through an elastic analysis of statically determinate structures, students are expected to learn the basic mechanical behavior of structures subjected to static loads.
Students in the Architecture major will also be able to learn basic knowledge in the Architectural Engineering, which can be applied in a variety of design and planning projects.

2. Course Objectives & course outcome

최종목표는 건축구조물에 하중(외력)이 작용할 때, 구조물에 생기는 변화(응력, 변형 등)를 해석하는 기초적인 지식을 습득하는 것이다. 외력에 의해 구조물에 생기는 부재력(축방향력, 전단력, 휨 모멘트)을 해석하고 구조부재의 단면의 특성을 이용하여 구조부재내에 존재하는 응력의 분포와 크기를 해석하고 이해하여 구조부재의 기초적인 설계 개념을 익히고 전반적인 건축(공)학의 전문가가 되는데 필요한 능력을 얻게 됩니다.
교과목 학습 성과는 다음과 같이 정리할 수 있습니다.
1) 구조물에 작용하는 하중의 영향을 분석하고 설명할 수 있다.
2) 하중에 의해 발생하는 구조물 내의 부재력(축방향력, 전단력, 휨 모멘트)을 해석하고 설명할 수 있다.
3) 부재 내에 발생한 부재력의 의미와 응력의 분포를 해석할 수 있다.

The objective of the course is that the students acquire the basic knowledge in the structural analysis: determined the force and moment that act within a structural member, calculate the internal loadings developed in structural members, and understand the basic concept of the structural design process.
The outcome of the course can be described as follows:
1) determine the effects of external loads on statically determinate structures,
2) analyze the internal loadings developed in structural members, and
3) calculate the distribution of the stress.

3. Class types and activities

Off-line lectures are given as a primary lesson tool. Students will take 3 quizzes (1 quiz before and 2 quizzes after the midterm exam).

4. Teaching Method

- [V] lecture
- [ ] discussion and debate
- [ ] team project(presentation and case studies)
- [ ] experiments(role-playing,etc)
- [ ] designing and production
- [ ] on-site learning(on-site training)
- [ ] others

5. Support Systems in Use

- [V] AjouBb
- [ ] automatic recording system
- [ ] web-based assignment
- [ ] cyber lecture
- [ ] online content
- [ ] class behavior analyazing system
- [ ] others

6. Teaching Tools

- [V] PBL(Problem Based Learning)
- [ ] CBL(Case Based Learning)
- [ ] TBL(Team Based Learning)
- [ ] UR(Undergraduate Research)
- [ ] FL(Flipped Learning)
- [ ] DSAL(Data Sciencd Active Learning)
- [ ] others

7. Evaluation method of course outcome

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
Attendance		10%	1/8 credit deducted at every absence until zero, and F thereafter
midterm exam	1	25%	
final exam	1	30%	
quiz	3	30%	

7. Evaluation method of course outcome

Evaluation Item	The Number of Times	Evaluation Proportion	Remarks
presentation			
discussion			
homework			
etc		5%	
study hours			

8. Textbook and Reference material

Main/Sub	Title	Writer	Publisher	Publication year
Main	Structural Analysis 9th Ed. In SI Unit	R.C. Hibbeler	Pearson	2014
Sub	구조 역학	김상식	기문당	2009

9. Class system and Class shedule

Week 1:Various types of structural forms and loads.
Weeks 2-7:Determination of forces at the supports and connections of statically determinate beams and frames.
Week 8: Midterm Exam
Weeks 9-10:Analysis of various types of statically determinate trusses.
Weeks 11-15:Shear and bending-moment functions and diagrams for beams and frames.
Week 16: Final Exam

< Schedule >

* language : K-korean, E-English

Weeks	Title of lecture	language	time distribution(minutes)			Teaching Method	evaluation method
			theory	design	experiment practice		
1	Introduction / Classification of Structures	K/E	3			Lecture	
2	Loads	K/E	3			Lecture	
3	Structural Design / Idealized Structure & Principle of Superposition	K/E	3			Lecture	
4	Equilibrium Equations & Determinacy and Stability	K/E	3			Lecture	
5	Quiz 1 / Quiz Review	K/E	3		1.5	Review	Quiz

< Schedule >

* language : K-korean, E-English

Weeks	Title of lecture	language	time distribution(minutes)			Teaching Method	evaluation method
			theory	design	experiment practice		
6	Application of the Equations of Equilibrium	K/E	3			Lecture	
7	Application of the Equations of Equilibrium / Midterm Review	K/E	3			Lecture / Review	
8	Midterm Exam	K/E	3		1.5		Written Exam
9	Exam Review / Truss Analysis: Method of Joints	K/E	3			Review / Lecture	
10	Truss Analysis: Zero-Force Members / Truss Analysis: Method of Sections	K/E	3			Lecture	
11	Quiz 2 / Quiz Reveiw	K/E	3		1.5	Review	Quiz
12	Internal Loadings at a Specified Point / Shear and Moment Functions	K/E	3			Lecture	
13	Quiz 3 / Quiz Reveiw	K/E	3		1.5	Review	Quiz
14	Shear and Moment Diagrams for a Beam / Frame	K/E	3			Lecture	
15	Section Design / Final Review	K/E	3			Lecture / Review	
16	Final Exam	K/E	3		1.5		Written Exam

10. Contribution index of the course for attaining ABEEK program outcomes

course outcome	contribution scale
No Data	

11. Analysis of improved matters for the previous semester

13. Reference items