



CT 311 – ANALYSIS OF BUILDING STRUCTURES

UNIVERSITY VISION

A leading University in advancing scholarly innovation, multi-cultural convergence, and responsive public service in a borderless Region.

UNIVERSITY MISSION

The University shall primarily provide advanced instruction and professional training in science and technology, agriculture, fisheries, education and other related fields of study. It shall also undertake research and extension services, and provide progressive leadership in its areas of specialization.

UNIVERSITY STRATEGIC GOALS

- a. Deliver quality service to stakeholders to address current and future needs in instruction, research, extension, and production
- b. Observe strict implementation of the laws as well as the policies and regulations of the University
- c. Acquire with urgency state-of-the-art resources for its service areas
- d. Bolster the relationship of the University with its local and international customers and partners
- e. Leverage the qualifications and competences in personnel action and staffing
- f. Evaluate the efficiency and responsiveness of the University systems and processes

INSTITUTIONAL OUTCOMES (IO)

- a. Enhance competency development, commitment, professionalism, unity and true spirit of service for public accountability, transparency and delivery of quality services
- b. Provide relevant programs and professional trainings that will respond to the development needs of the region
- c. Strengthen local and international collaborations and partnerships for borderless programs
- d. Develop a research culture among faculty and students
- e. Develop and promote environmentally-sound and market-driven knowledge and technologies at par with international standards
- f. Promote research-based information and technologies for sustainable development
- g. Enhance resource generation and mobilization to sustain financial viability of the university

PROGRAM OUTCOMES (PO) COMMON TO ALL PROGRAMS AND ITS RELATIONSHIPS TO INSTITUTIONAL OUTCOMES

A graduate of the BindTech program can:	INSTITUTIONAL OUTCOMES (IO)						
	a	b	c	d	e	f	g
a. Analyze broadly defined industrial technology processes by using analytical tools that enhance creativity, innovativeness, and intellectual curiosity to improve methods, processes, and systems that meet the industry standards;	✓	✓				✓	

a. Design and implement broadly defined industrial systems, components, products, or processes to meet specific industry needs with proficiency and flexibility in the area of specialization in accordance with global standards;	✓	✓		✓		✓	
c. Apply appropriate techniques, resources, and state-of-the-art industrial technology tools to meet current industry needs and use these modern tools and processes to improve and increase entrepreneurial activities upholding the safety and health standards of business and industry;	✓		✓	✓	✓		
d. Communicate with diverse groups of clienteles the appropriate cultural language with clarity and persuasion, in both oral and written forms, including understanding and giving of clear instructions, high comprehension level, effectiveness in delivering presentations and writing documents, and articulating technological innovation outputs;	✓	✓	✓	✓	✓		
e. Develop leadership and management skills in a team-based environment by making informed decisions, keeping the team motivated, acting and delegating responsibility, and inspiring positive changes in the organization by exercising responsibility with integrity and accountability in the practice of one's profession;	✓	✓	✓	✓	✓		
f. Practice the moral responsibilities of an industrial technologist to manage and balance wider public interest and uphold the norms and safety standards of the industrial technology profession;				✓	✓	✓	✓
g. Demonstrate enthusiasm and passion for continuous personal and professional development in broadly defined industrial technology and effecting positive changes in the entrepreneurial and industrial endeavor; and	✓	✓	✓	✓	✓	✓	✓
h. Recognize the need for, and an ability to engage in lifelong learning.	✓	✓	✓	✓	✓	✓	✓

1 COURSE CODE CT 311A

2 COURSE TITLE Analysis of building structure

3 PREREQUISITE CT 212

4 CREDITS 3 units

5 COURSE DESCRIPTION

This course introduces students to the structural analysis and performance evaluation of buildings. Emphasis is placed on analyzing building components such as beams, columns, slabs, and frames under various loading conditions. Students will explore both traditional and modern analytical methods, including the use of computer-aided tools for modeling and simulation. Key topics include load distribution, lateral stability, seismic and wind loading, and material behavior. The course prepares students to assess the structural integrity and safety of buildings in accordance with relevant codes and standards. Laboratory sessions and project work are included to reinforce practical applications.

COURSE LEARNING OUTCOMES (CLO) AND ITS RELATIONSHIPS TO PROGRAM OUTCOMES

Course Learning Outcomes (CLO)	Program Outcomes							
	a	b	c	d	e	f	g	h
At the end of the course, a student can:								
a. Understand SKSU-VGMO, Classroom Policies, Course Overview, Course Requirements, and Grading System;	✓	✓	✓	✓	✓	✓	✓	✓
b. Evaluate building integrity using code standards and safety criteria.	✓	✓	✓	✓	✓	✓	✓	✓
c. Analyze building components using structural principles and appropriate analytical methods	✓	✓	✓	✓	✓	✓	✓	✓
d. Demonstrate understanding of construction materials behavior and their impact on design.	✓	✓	✓	✓	✓	✓	✓	✓
e. Work effectively in teams to evaluate and report on structural performance..	✓	✓	✓	✓	✓	✓	✓	✓
f. Communicate findings and solutions through technical reports and presentations.	✓	✓	✓	✓	✓	✓	✓	✓
g. Work effectively in teams to evaluate and report on structural performance	✓	✓	✓	✓	✓	✓	✓	✓
h. Use modern engineering tools and software for building analysis and design.	✓	✓	✓	✓	✓	✓	✓	✓

7 COURSE CONTENTS

WEEK	CONTENT	INTENDED LEARNING OUTCOMES((ILOs)	TEACHING AND LEARNING ACTIVITIES (TLA)	OUTCOMES-BASED ASSESSMENT (OBA)	COURSE LEARNING OUTCOME S (CLOs)
1	Course Orientation SKSU VMGO, Classroom Policies, Course Overview, Course Requirements, Grading System	At the end of the week, the student can: a. Discuss the University's VMGO, classroom policies, course overview, requirements, and grading system	Discuss the VMGO of the University, the classroom policies, scope of the course, course requirements and grading system	a. Participation in discussions	abcdefg
2	Introduction to Building Structures a. Role and importance of structures in buildings b. Basic structural elements of beams, columns, slabs, load paths	At the end of the week, the students can: a. Understand the role and importance of structures in buildings. b. Identify basic structural elements (e.g., beams, columns, slabs, load paths).	a. Interactive Lectures b. Class Discussions c. Case Study Analysis d. Group Brainstorming Sessions e. Guest Speaker Session f. Simulations / Role Plays g. Short Quizzes or Concept Mapping h. Video Lessons or Site Visits	a. Class Participation b. Listen to lecturers c. Group engagement d. Problem solving skills e. Data analyzations	abcdefg

	c. Classification of types of building structures	c. Classify types of building structures (e.g., load-bearing, framed).	i. Problem-Solving Workshops		
3	<p>Load Types and Distribution</p> <ul style="list-style-type: none"> a. Different types of loads acting on buildings b. Distribution of loads through structural systems c. Calculation of basic load values using code-based approach 	<p>At the end of the week, the students can:</p> <ul style="list-style-type: none"> a. Identify different types of loads acting on buildings (dead load, live load, wind load, seismic load, etc.). b. Understand how loads are distributed through structural systems. c. Calculate basic load values and combinations using code-based approaches. 	<ul style="list-style-type: none"> a. Interactive Lectures b. Class discussion c. Case study d. Hands -on activities 	<ul style="list-style-type: none"> a. Class participation b. Group activity c. Conceptualize Quizes /Summative Test d. Performance task e. Laboratories 	abcdefg
4	<p>Structural Behavior of Materials</p> <ul style="list-style-type: none"> a. Mechanical properties of structural materials b. Behavior of Common materials (concrete, steel, timber, etc.) c. Properties of materials 	<p>At the end of the week, the students can:</p> <ul style="list-style-type: none"> a. Understand mechanical properties of structural materials (e.g., strength, elasticity, ductility, toughness). b. Compare behavior of common materials (concrete, steel, timber, etc.) under different types of loading. c. Explain how material properties influence structural design decisions. 	<ul style="list-style-type: none"> a. Report writing workshops b. Report feedback sessions 	<ul style="list-style-type: none"> a. Conceptual Quiz b. Class participation c. Activity outputs d. Analysis Assignment e. Performance Analysis Report f. Research Presentation 	abcdefg
5	<p>Structural Frames and Load Paths</p> <ul style="list-style-type: none"> a. Concept of Structural frames b. Load paths in a structural frame (beams, columns, and connections) 	<p>At the end of the week, the students can:</p> <ul style="list-style-type: none"> a. Understand the concept of structural frames and how they are designed to carry loads. b. Identify the load paths in a structural frame (beams, columns, and connections). c. Analyze how forces are transferred from one component to another in a building. 	<ul style="list-style-type: none"> a. Time-in/time-out log monitoring b. Midterm evaluations c. Final hour certification 	<ul style="list-style-type: none"> a. Conceptualize Quizes b. Class participation c. Activity Outputs d. Laboratories e. Analysis Assignments f. Hands-on outputs 	abcdefg

6	MIDTERM EXAM				
7	Building Codes and Safety Standards a. Importance of building codes and safety standards	At the end of the week, the students can: a. To understand the importance of building codes and safety standards in the construction industry. b. To identify key building codes and safety regulations (e.g., fire safety, structural integrity, accessibility, etc.). c. To learn how to apply building codes and safety standards in the design and construction of buildings.	a. Interactive Lectures b. Group Performances c. Data Analysis d. Group Projects e. Presentations f. Hands-on activities	a. Conceptualize Quizzes b. Class participation c. Activity Outputs d. Laboratories e. Analysis Assignments f. Hands-on outputs	abcdefg
11	FINAL EXAMINATION				

Total No. of Hours : 54

8 COURSE REQUIREMENTS AND COURSE POLICIES

Each student is required to:

COURSE REQUIREMENTS

1. submit accomplished assignments, and activities;
2. make a PowerPoint presentation, and a written summary of the assigned report;
3. participate actively in all discussion;
4. discuss an assigned topic to report and participate in class discussions; and
5. pass the major exams (midterm and final)

COURSE POLICIES

Attendance: A student will be marked late if he/she enters the class 5 minutes after start of class period. Any student who comes to class 15 minutes after the scheduled time or always late for three consecutive meetings shall be marked absent.

Missed work or exam: Any student who missed to submit a work assignment or to take a test should consult the concerned instructor for immediate compliance

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Cheating and Plagiarism: Any student who committed any form of academic dishonesty (e.g., copy-paste plagiarism) shall be given disciplinary action provided in the SKSU Student's Handbook

Use of Technology: Cell phones should be turned off while the session is in progress. Using laptops, notebook PCs, smart phones, and tablets shall be allowed only when needed. A scientific calculator (e.g. Casio fx-991ES) shall be utilized in solving.

9 GRADING SYSTEM AND RUBRICS FOR GRADING

GRADING SYSTEM

Midterm Grade	
Midterm Examination	40%
Attendance/ Class Participation	15%
Quizzes/Assignments	15%
Project (Report)	30%
TOTAL	100%

Final Term Grade	
Final Term Examination	40%
Attendance/Class Participation	15%
Quizzes/Assignments	15%
Project	30%
TOTAL	100%

FINAL GRADE	
Midterm Grade	50%
Final Term Grade	50%
TOTAL	100%

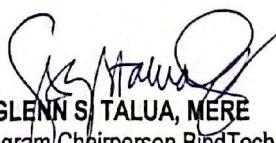
Materials used: Laptop, PowerPoint presentations, and video clips
Books, Magazines, Online slides, Teacher-made slides

References:
M. Morris Mano, "Digital Design," 5th Edition, Pearson, 2013.
John F. Wakerly, "Digital Design: Principles and Practices," 4th Edition, Prentice Hall, 2017.
R. P. Jain, "Modern Digital Electronics," 4th Edition, Tata McGraw-Hill, 2010.

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