



**COLLEGE OF INDUSTRIAL TECHNOLOGY**  
**ADT 123 – DESIGN STRUCTURES OF A RESIDENTIAL BUILDING**

**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 Sultan Kudarat State University can:	INSTITUTIONAL OUTCOMES (IO)						
	a	b	c	d	e	f	g
a. Articulate effectively and independently in multi-disciplinary and multi-cultural teams the latest development in the fields practiced such as Automotive, Architectural Drafting, Civil, Electrical, Electronics, Food and its allied discipline,	✓	✓		✓	✓	✓	✓
b. Lead in the promotion and preservation of Filipino historical and cultural heritage, social empowerment and environmental sustainability in a professional and ethical approach.	✓	✓	✓	✓	✓	✓	✓
c. Generate research-based information and technologies at par from international standards, and	✓	✓	✓	✓	✓	✓	✓
d. Promote and transfer knowledge and technologies for effective and efficient school-industry partnership	✓	✓	✓	✓	✓	✓	✓

1 COURSE CODE ADT 123  
 2 COURSE TITLE DESIGN STRUCTURES OF A RESIDENTIAL BUILDING  
 3 PREREQUISITE ADT 111  
 4 CREDITS 3 units

#### 5 COURSE DESCRIPTION

THIS COURSE COVERS THE DESIGN PRINCIPLES AND STRUCTURAL SYSTEMS USED IN RESIDENTIAL BUILDINGS. IT EMPHASIZES LOAD ANALYSIS, MATERIAL SELECTION, STRUCTURAL DETAILING, AND COMPLIANCE WITH RELEVANT BUILDING CODES. STUDENTS WILL DEVELOP SKILLS IN STRUCTURAL DRAFTING USING CAD SOFTWARE AND APPLY SUSTAINABLE DESIGN CONCEPTS.

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

At the end of the course, a student can:	Course Learning Outcomes (CLO)	Program Outcomes			
		a	b	c	d
a. Design structural systems for residential buildings following applicable codes.		✓		✓	
b. Analyze loads and forces acting on beams, columns, and foundations.		✓		✓	
c. Produce structural drawings using CAD software.			✓		✓
d. Evaluate sustainable materials and design strategies for residential structures.		✓	✓		

#### 7 COURSE CONTENTS

WEEK	CONTENT	INTENDED LEARNING OUTCOMES( ILOs)	TEACHING AND LEARNING ACTIVITIES (TLA)	OUTCOMES-BASED ASSESSMENT (OBA)	COURSE LEARNING OUTCOMES (CLOs)
1	<b>Course Orientation</b> SKSU VMGO, Classroom Policies, Course Overview, Course Requirements, Grading System	At the end of the Orientation, the Learners can: a. Discusses the University's VMGO, classroom policies, scope of the course, course requirements and grading system	Discuss the VMGO of the University, the classroom policies, scope of the course, course requirements and grading system		
2-3	<b>Structural Design Fundamentals:</b> a. Load types and combinations b. Building code overview (ANSI, NBC)	At the end of the Lesson, the Learners can: a. Identify types of loads in residential structures. b. Apply building codes to design scenarios. c. Calculate load combinations.	a. Interactive Lecture b. Load calculation exercises c. Code compliance discussion	a. Problem sets on load calculations b. Code application quiz	a b

4-5	<b>Material Properties and Systems:</b> a. Wood framing b. Masonry walls c. Concrete foundations	At the end of the Lesson, the Learners can: a. Compare structural properties of common materials. b. Design basic wood and masonry components. c. Detail concrete foundation reinforcement.	a. Material testing lab b. CAD drafting of foundation details c. Site visit to residential construction	a. Lab reports on materials b. CAD foundation drawing submission	a d
6-7	<b>Floor Systems:</b> a. Joist and beam sizing b. Subfloor layout c. Vibration and deflection control	At the end of the Lesson, the Learners can: a. Size floor joists using span tables. b. Design subfloor layouts for load distribution. c. Analyze vibration control methods.	a. CAD floor system exercises b. Structural modeling software demo c. Case study analysis	a. Quiz on joist sizing b. CAD floor system project	b c
8	<b>MIDTERM EXAM</b>				
9-10	<b>Foundation Systems:</b> a. Types of foundations b. Soil bearing capacity c. Footing design	At the end of the Lesson, the Learners can: a. Select appropriate foundation types. b. Calculate footing sizes based on soil data. c. Detail foundation reinforcement.	a. Lecture and examples b. CAD footing design exercises c. Soil testing demo	a. Footing design project b. Quiz on foundation types	a b c
11-12	<b>Lateral Load Resistance:</b> a. Shear walls b. Bracing systems c. Wind and seismic considerations	At the end of the Lesson, the Learners can: a. Design shear walls for lateral stability. b. Analyze bracing methods. c. Apply wind and seismic load provisions.	a. Case studies b. CAD detailing of shear walls c. Group discussions	a. Structural analysis report b. CAD shear wall drawings	a b c
13	<b>Sustainable Structural Design:</b> a. Energy-efficient framing b. Use of recycled materials c. Insulation and thermal performance	At the end of the Lesson, the Learners can: a. Incorporate sustainable materials in design. b. Optimize framing for energy efficiency. c. Calculate insulation requirements.	a. Workshop on sustainable materials b. CAD detailing of energy-efficient assemblies c. Guest lecture	a. Presentation on sustainable design b. CAD sustainable detail submission	d
14	<b>Review and Project Work:</b> a. Integration of structural components b. Final project preparation	At the end of the Lesson, the Learners can: a. Integrate structural elements in a residential design. b. Prepare complete structural drawings. c. Review key concepts for final exam.	a. Group project work b. Instructor feedback sessions c. Review lectures	a. Quiz on thread and gear Project submission b. Peer and instructor evaluation	a b c d
15	<b>FINAL EXAMINATION</b>				

Total No. of Hours: 120

## 8 COURSE REQUIREMENTS AND COURSE POLICIES

### COURSE REQUIREMENTS

Each student is required to:

1. Regularly attend and participate in class discussions and activities.
2. Complete all of assigned Working drawing exercises and projects.
3. Pass the major exams (midterm and final).
4. Adhere to drafting standards and conventions.

### 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 lat 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

**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 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.

## 9 GRADING SYSTEM AND RUBRICS FOR GRADING

### GRADING SYSTEM

Midterm Grade	
Plates	45%
Examination	35%
Attendance/ Class Participation	15%
Quizzes	10%
<b>TOTAL</b>	<b>100%</b>
Final Grade	
Plates	45%
Examination	35%
Attendance/ Class Participation	15%
Quizzes	10%
<b>TOTAL</b>	<b>100%</b>

### RUBRICS FOR WORKING DRAWING ASSIGNMENTS

Criteria	Excellent (4 points)	Good (3 points)	Fair (2 points)	Poor (1 point)
Accuracy & Code Compliance	All structural elements are accurately represented and comply fully with relevant building codes and standards. Dimensions and specifications are precise and error-free.	Most structural elements are accurately represented with minor deviations from codes and standards. Dimensions are generally accurate.	Some structural elements are inaccurately represented, with noticeable deviations from codes. Dimensions contain several errors.	Many structural elements are misrep and do not comply with codes. Dim are largely inaccurate.
Completeness	Drawing set includes all necessary plans, elevations, sections, and details required for construction. All components are clearly labeled and specified.	Drawing set is mostly complete but may be missing some minor details or components. Most elements are labeled.	Drawing set is incomplete, missing significant plans, sections, or details. Labeling is inconsistent.	Drawing set is severely incomplete, essential information required for construction. Labeling is minimal or non-existent.
Clarity & Readability	Drawings are exceptionally clear, well-organized, and easy to read. Line weights, text sizes, and symbols are used effectively to communicate information.	Drawings are generally clear and readable with good organization. Minor improvements could enhance clarity.	Drawings are somewhat difficult to read due to poor organization, inconsistent line weights, or illegible text.	Drawings are very difficult to read/interpret due to disorganization, poor quality, and illegible text.

**10 REFERENCES**

- Allen, E., & Iano, J. (2019). Fundamentals of building construction: Materials and methods (7th ed.). Wiley.  
Ambrose, J. A., & Tripeny, P. (2011). Simplified engineering for architects and builders (12th ed.). Wiley.  
Ching, F. D. K. (2014). Building construction illustrated (5th ed.). Wiley.  
Schodek, D. L., Bechthold, M., Steinberg, D., & Kielb, J. (2019). Structures (7th ed.). Pearson.  
International Code Council. (Year). International Residential Code. Country.

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