Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
ACCESS, EJC Montilla, 9800 City of Tacurong
Province of Sultan Kudarat

CT 211 - PLUMBING

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

	INSTITUTIONAL OUTCOMES (IO)						
A graduate of Sultan Kudarat State University can:	a	b	c	d	e	f	g
a. Ability to analyze broadly defined industrial technology processes by using analytical tools that enhances creativity, innovativeness, and intellectual curiosity to improve methods, processes, and systems that meet the industry standards				✓	✓	✓	
b. Ability to 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. Ability to 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	*Ability* to 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.	Ability to 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.	Ability to 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	✓						

1 **COURSE CODE** CT 211
2 **COURSE TITLE** Plumbing
3 **PREREQUISITE** CT 122
4 **CREDITS** 3 units

5 **COURSE DESCRIPTION**
This course provides students with knowledge and practical skills in plumbing systems installation, maintenance, and repair. It covers the use of plumbing tools, reading and interpreting plumbing plans, pipefitting, drainage systems, and safety procedures. The course also introduces the Plumbing Code of the Philippines and industry standards for residential and light commercial buildings.

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

Course Learning Outcomes (CLO)	Program Outcomes						
At the end of the course, a student can:	a	b	c	d	e	f	g
a. Demonstrate proper use of plumbing tools and equipment.	✓	✓	✓	✓	✓	✓	✓
b. Interpret plumbing plans and diagrams accurately.	✓	✓	✓	✓	✓	✓	✓
c. Perform basic pipefitting and jointing techniques.	✓	✓	✓	✓	✓	✓	✓
d. Install water supply and drainage systems.	✓	✓	✓	✓	✓	✓	✓
e. Apply safety procedures and comply with plumbing codes.	✓	✓	✓	✓	✓	✓	✓
f. Conduct basic troubleshooting and maintenance.	✓	✓	✓	✓	✓	✓	✓

7 **COURSE CONTENTS**

WEEK	CONTENT	INTENDED LEARNING OUTCOMES((ILOs)	TEACHING AND LEARNING ACTIVITIES (TLA)	OUTCOMES-BASED ASSESSMENT (OBA)	COURSE LEARNING

					OUTCOMES (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		
2	**Introduction to Plumbing** a. Definition and function of Define plumbing and describe its significance in construction and public health. b. Identify the roles and responsibilities of a plumber. c. Recognize the major components and systems in a basic plumbing installation. d. Explain the historical development and importance of plumbing codes.	At the end of the week, the student can: a. Define plumbing and describe its significance in construction and public health. b. Identify the roles and responsibilities of a plumber. c. Recognize the major components and systems in a basic plumbing installation. d. Explain the historical development and importance of plumbing codes.	a. Lecture-discussion on the definition, scope, and importance of plumbing. b. Video presentation on the evolution of plumbing and water systems. c. Class discussion on the role of plumbers in building projects. d. Group activity: Brainstorming and sharing common plumbing systems seen at home or in the community.	a. Quiz on key terms, history, and importance of plumbing. b. Reflection paper: "The Role of Plumbing in Modern Society." c. Participation rubric for group discussion and reporting.	a, b, c, and d
3	**Tools and Materials** a. Tools and Materials in Plumbing	At the end of the week, the student can: a. Identify common hand and power tools used in plumbing. b. Classify plumbing materials according to their function (e.g., pipes, fittings, adhesives). c. Demonstrate proper handling and care of plumbing tools. d. Select appropriate tools and materials for specific plumbing tasks.	a. Demonstration of plumbing tools and materials. b. Hands-on activity: Tool identification and proper usage. c. Video presentation on types of plumbing materials and their applications. d. Workshop: Matching tools to corresponding plumbing tasks.	a. Practical test: Identification and proper handling of plumbing tools. b. Worksheet: Categorizing plumbing materials based on use. c. Performance checklist during hands-on activity.	a, b, c, and f

4	**Plumbing Symbols and Plans** a. Introduction to standard plumbing symbols b. Types of plumbing plans (e.g., isometric, floor plan, riser diagram) c. Reading and interpreting plumbing plans d. Application of plumbing symbols in plan drafting e. Code compliance and plan checking	At the end of the week, the student should be able to: a. Identify common plumbing symbols used in architectural and plumbing plans. b. Distinguish different types of plumbing plans and their purposes c. Analyze plumbing plans for fixture layout, pipe routing, and connections d. Draft a simple plumbing layout using appropriate symbols e. Check plumbing plans for compliance with the National Building Code or local plumbing code	a. Lecture-discussion with visual aids; Presentation of standard plumbing symbol charts b. Group discussion; viewing and analyzing sample plumbing plans c. Hands-on activity using printed plumbing plans; guided worksheet d. Drawing activity using manual or CAD drafting tools e. Lecture-discussion; guest speaker (plumbing inspector or engineer) f.	a. Quiz on plumbing symbol identification b. Matching type and short identification activity c. Performance Task: Annotate a plumbing plan by identifying fixtures, supply, and drainage lines d. Practical test: Create a plumbing plan for a small residential bathroom e. Written reflection or checklist activity on plan compliance	a, b, e, and f
4	**Pipefitting and Jointing Techniques** a. identification and use of different types of pipes and fittings b. proper handling of plumbing tools and equipment c. execution of cutting and threading procedures d. application of various jointing techniques, and e. The inspection and testing of completed pipe joints.	At the end of the week, the student can: a. Identify various types of pipes and fittings and explain their appropriate uses in plumbing systems. b. Select and use appropriate plumbing tools and equipment for pipefitting tasks. c. Demonstrate proper techniques in cutting and threading metal and plastic pipes. d. Apply standard jointing methods such as solvent welding, threading, compression fittings, flanged joints, and soldering. e. Conduct leak testing and visual inspection to ensure the quality and integrity of plumbing joints.	a. Lecture-discussion with actual samples; Interactive presentation; Group classification activity b. Demonstration and hands-on practice using pipe wrenches, cutters, dies, etc. c. Teacher-guided workshop; Practice cutting/threading various pipe materials d. Hands-on activity: Creating sample joints using different techniques e. Simulated testing activity; Demonstration using air or water pressure tests	a. Demonstrate knowledge of different pipe materials and their uses in plumbing systems. b. Operate plumbing tools and equipment safely and effectively. c. Perform cutting and threading of pipes using proper procedures. d. Assemble pipe joints using standard plumbing techniques. e. Inspect and test completed plumbing systems in accordance with industry standards.	a, b, c, e, and f

5	**Water Supply System** a. Overview of water supply systems and their components (e.g., sources, pumps, storage tanks, pipes, valves, fixtures) b. Types of water supply systems (direct, indirect, gravity-fed, pressurized) c. Basic water distribution principles d. Reading and interpreting water supply plans and diagrams e. Drafting simple water supply layouts f. Plumbing codes and safety standards related to water supply system design	At the end of the week, the student can: a. Explain the function and components of a water supply system. b. Differentiate between direct and indirect types of water supply systems. c. Interpret plumbing diagrams and water supply plans. d. Draw a basic residential water supply layout using proper plumbing symbols. e. Identify safety procedures and code requirements relevant to water supply systems.	a. Lecture-discussion using diagrams, videos, and real-life examples of water supply systems b. Group discussion on the differences between direct and indirect systems c. Analysis of sample water supply plans in pairs or groups d. Teacher-guided demonstration on reading and drafting water supply layouts e. Hands-on activity: Drawing or drafting a water supply plan using traditional or digital tools f. Review of plumbing codes and safety procedures through a short presentation	a. Written quiz on parts and functions of the water supply system b. Worksheet activity: Identify and label components in a sample plan c. Comparison activity: Analyze and contrast different water supply system types d. Performance-based assessment: Draft a complete residential water supply layout e. Checklist and peer review: Evaluate layout for accuracy, completeness, and compliance with plumbing codes	a, b, c, e, and f
6	MIDTERM EXAM				
7	**Drainage, Waste, and Vent Systems (DWV** a. Introduction to Drainage, Waste, and Vent (DWV) systems and their purpose in plumbing b. Components of DWV systems: traps, cleanouts, waste lines, soil stacks, vent pipes c. Principles of gravity flow and proper pipe slope d. Types of fixtures and their connection to the DWV system	At the end of the week, the student can: a. Describe the function and importance of a Drainage, Waste, and Vent (DWV) system in a plumbing network. b. Identify and explain the components and flow direction in a DWV system. c. Analyze and interpret DWV system plans based on standard plumbing layouts. d. Apply plumbing codes related to pipe sizing, venting, and material selection. e. Draft a basic DWV system layout for a small residential structure using proper symbols and conventions.	a. Interactive lecture with visual aids showing real-life DWV systems and components b. Demonstration of how gravity and proper pipe slope affect waste drainage c. Group activity: Label and explain parts of a DWV diagram d. Hands-on practice: Create a schematic layout of a DWV system using paper or CAD tools e. Code-checking exercise: Analyze DWV plans and identify code violations f. Class discussion on common DWV issues and troubleshooting strategies	a. Written quiz to assess understanding of DWV components and functions b. Diagram labeling exercise: Identify all elements in a provided DWV schematic c. Performance-based assessment: Draft a residential DWV layout with correct sizing and venting d. Practical task: Solve a simulated DWV problem (e.g., siphoning or improper venting) e. Rubric-based evaluation of the drafted layout for accuracy, completeness, and code compliance	a, b, d, e, and f

	e. Common DWV layout configurations in residential and commercial buildings f. Plumbing code requirements for DWV systems (e.g., pipe sizing, venting rules, materials)				
8	**Plumbing Code and Safety** a. Overview of the National Plumbing Code of the Philippines (NPCP) or applicable local plumbing code b. Objectives and significance of plumbing codes in construction and public health c. Common plumbing code provisions: pipe sizing, material specifications, fixture units, venting requirements, and installation standards d. Safety guidelines in plumbing works: personal protective equipment (PPE), hazard identification, accident prevention, and safe tool usage e. Compliance procedures, inspection processes, and penalties for code violations f. Case studies of plumbing code violations and their consequences	At the end of the week, the student can: a. Explain the purpose and importance of plumbing codes in ensuring health, safety, and environmental protection. b. Identify key provisions of the plumbing code relevant to residential and commercial plumbing systems. c. Apply plumbing code guidelines to actual or simulated plumbing layouts. d. Demonstrate safe practices and proper use of tools and equipment in plumbing tasks. e. Analyze real-life cases of plumbing code violations and suggest corrective actions.	a. Lecture-presentation on the National Plumbing Code and safety regulations with printed code excerpts b. Class discussion on the importance of code compliance and health standards c. Group activity: Analyze sample plumbing plans for code compliance d. Demonstration of PPE usage and safety practices on-site or in a workshop setting e. Role-playing inspection simulation to identify violations and propose solutions f. Case study discussion: Review and critique real plumbing violations from actual reports or documented cases	a. Written quiz covering key code provisions and safety rules b. Group report: Identify and present code violations in a sample plumbing layout c. Performance-based assessment: Demonstrate correct PPE use and observe safety protocols during workshop tasks d. Practical activity: Annotate a plumbing plan with correct code-based modifications e. Reflection paper on the significance of plumbing codes in protecting public health and safety	a, b, d, e, and f

9	**Troubleshooting and Maintenance** a. Definition and importance of troubleshooting and maintenance in plumbing systems b. Common plumbing problems: leaks, clogs, low water pressure, noisy pipes, and faulty valves c. Tools and equipment used for diagnosing and fixing plumbing issues d. Step-by-step procedures for basic troubleshooting and repair tasks e. Preventive maintenance techniques for extending the life of plumbing systems f. Documentation of maintenance work and reporting of issues g. Safety precautions during troubleshooting and repair activities	a. Identify common plumbing system problems and their possible causes. b. Use appropriate tools and techniques to troubleshoot plumbing issues effectively. c. Perform basic repair and maintenance procedures in accordance with plumbing standards. d. Follow safety protocols while conducting troubleshooting and maintenance activities. e. Document repair and maintenance work accurately for record-keeping and reporting purposes.	a. Teacher-led discussion on common plumbing issues and their causes b. Demonstration of basic troubleshooting procedures for faucets, drains, and piping systems c. Hands-on workshop activity: students practice diagnosing and repairing simulated plumbing faults d. Group activity: maintenance checklist creation for a small residential plumbing system e. Discussion on safety practices with live demonstrations of PPE use f. Role-play or simulation: students act as technicians responding to plumbing maintenance requests	a. Written quiz identifying causes and solutions for common plumbing issues b. Practical assessment: students troubleshoot and fix a plumbing problem in a controlled setup c. Checklist-based evaluation of students' maintenance and repair performance d. Safety evaluation: correct use of PPE and adherence to safety procedures during repairs e. Submission of a maintenance report documenting findings, actions taken, and safety measures applied	
10	**FINAL EXAMINATION**				

Total No. of Hours : 54

8 COURSE REQUIREMENTS AND COURSE POLICIES

COURSE REQUIREMENTS

Each student is required to:

1. submit accomplished assignments, problem sets and a mini-research project;
2. prepare a comprehensive lecture notebook;
3. make a PowerPoint presentation, and a written summary of the assigned report;
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

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%

10 REFERENCES

Textbooks

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Department of Public Works and Highways. (2019). *Revised National Plumbing Code of the Philippines*. https://www.dpwh.gov.ph/dpwh/
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International Code Council. (2021). *2021 International Plumbing Code*. https://codes.iccsafe.org/
Khan Academy. (n.d.). *Water supply and drainage overview*. Retrieved May 6, 2025, from https://www.khanacademy.org
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