

MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE

COURSE OUTLINE

DEPT. RNEW

COURSE NUMBER: 1115

NUMBER OF CREDITS: 3

Lecture: 3 Lab: 0 OJT: 0

Course Title:
Mechanical Fundamentals for Process Controls

Catalog Description:
Mechanical Fundamentals for Process Controls covers the basic functions of equipment such as drive components, pumps, compressors, valves and basic electrical equipment. It explores various methods and the importance of equipment lubrication. Additional topics covered in this course include material handling equipment and procedures. Mechanical Fundamentals explains how equipment is used in systems such as piping systems, heat exchangers, cooling towers, refrigeration, furnace and boiler systems. Startup, shutdown, operation and troubleshooting procedures of various mechanical systems will be explained.

Prerequisites or Necessary Entry Skills/Knowledge:
None

FULFILLS MN TRANSFER CURRICULUM AREA(S) (*Leave blank if not applicable*)

- ☐ Goal 1: Communication: By meeting the following competencies:
- ☐ Goal 2: Critical Thinking: By meeting the following competencies:
- ☐ Goal 3: Natural Sciences: By meeting the following competencies:
- ☐ Goal 4: Mathematics/Logical Reasoning: By meeting the following competencies:
- ☐ Goal 5: History and the Social and Behavioral Sciences: By meeting the following competencies:
- ☐ Goal 6: The Humanities and Fine Arts: By meeting the following competencies:
- ☐ Goal 7: Human Diversity: By meeting the following competencies:
- ☐ Goal 8: Global Perspective: By meeting the following competencies:
- ☐ Goal 9: Ethical and Civic Responsibility: By meeting the following competencies:
- ☐ Goal 10: People and the Environment: By meeting the following competencies:

Topics to be Covered
Process Drawings and Industry Standards
Piping, Gaskets, Tubing, Hoses and Fittings
Valves
Pumps, Compressors, and Turbines
Motors and Engines
Power Transmission and Lubrication

Heating and Cooling Equipment
Boilers
Vessels and Reactors
Filters and Dryers
Miscellaneous Equipment

Student Learning Outcomes	
Demonstrate knowledge of process control and instrumentation.	
Explain the concepts of troubleshooting and maintenance for process control.	
Describe the functions of valves and pneumatic actuators.	
Identify the various types of pumps, compressors, and turbines.	
Describe the basic operations of cooling towers and condensers.	
Identify and describe common pipe fittings and pipe line control.	
Identify the drivers and auxiliary equipment for pumps.	
Explain the basic operations of heat exchangers.	
State the basic requirements of steam production and combustion.	

Is this course part of a transfer pathway: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
<small>*If yes, please list the competencies below</small>

Revised Date: 3/29/2022