

MINNESOTA WEST COMMUNITY & TECHNICAL COLLEGE

COURSE OUTLINE

DEPT. ELWT

COURSE NUMBER: 1110

NUMBER OF CREDITS: 3

Lecture: 2 Lab: 1 OJT 0

Course Title:

Mechanical Systems

Catalog Description:

Mechanical Systems provides an understanding of wind turbine drive systems (gearboxes) and associated components, introduced two different types of gearboxes and associated mechanical systems and subsystems of today's wind turbines, focus on lubrication, oil analysis, construction and preventative maintenance techniques for modern wind turbine drive systems.

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

Identify different parts of a wind turbine drive system.

Identify with the past and current gearbox designs.

Describe how a gearbox system works.

Investigate different components of the gearbox (bearing, gears, and shafts).

Explore the different types of braking, gear reduction and cooling systems.

Student Learning Outcomes

Investigate the basic drivetrain principles.

Investigate gear/bearing failure analysis.

Operate non-destructive testing techniques.
Demonstrate how to use tools and techniques on gearboxes.
Explore the purpose of the gearbox.
Investigate oil sample analysis.
Inspect braking and oil system components.
Investigate the types of failures (fatigue, corrosion, loop, fractures, etc.)
Identify the drivetrain parts and where they are located.
Study gearbox operation and failures in wind energy.
Study the past and future of wind turbine drivetrains.

Is this course part of a transfer pathway: Yes No
***If yes, please list the competencies below**

Revised Date: 6/1/2021