COURSE OUTLINE

2022/2023

COURSE NAME: Prime Movers
COURSE CODE: POWT1241

COURSE DESCRIPTION

This course focuses on Prime Movers, namely steam turbines, gas turbines and industrial internal combustion engines. Topics include types and modes of operation of this equipment. Prime Mover Plant auxiliary equipment that is covered includes compressors and compressed air systems, pump types and their operation, as well as cooling towers. The types of rotating equipment bearings and lubrication methods will be delivered. Fourth and Third Class material will be covered in this class.

Course Credits: 3.00

LEARNING OUTCOMES

OUTCOME	Upon successful completion of this course, you will be able to
1	Explain principles of lubrication. The following concepts, skills, and issues are used to support this Outcome: • Explain the purpose of lubrication. • Explain lubricant classifications, properties, application, additives and selection. • Types of bearing lubrication including film lubrication, sleeve bearing lubrication and thrust bearings.
2	Explain bearing operation. The following concepts, skills, and issues are used to support this Outcome: • Explain the causes of bearing failures. • Explain cleaning and replacement or bearings. • Describe the different types of bearings.
3	Explain pump and compressor systems. The following concepts, skills, and issues are used to support this Outcome: • Explain function and types of compressors, compressor operation and air dryers. • Explain function and types of pumps, pump operation and maintenance. • Describe different types of cooling towers and their operation and maintenance.

4	Explain prime movers and heat engines. The following concepts, skills, and issues are used to support this Outcome: • Explain Heat Engine concept. • Explain Steam Engine operation, reciprocating motion and expansive use of steam. • Explain Steam Turbine construction, operation and classification, including condensers. • Explain the operations of various cooling towers. • Explain Internal Combustion Engine construction, operation and classification, including types of fuels. • Explain Gas Turbine construction, operation and classification.

STUDENT EVALUATION

OUTCOME	ACTIVITY DESCRIPTION	MARK DISTRIBUTION
1	Written Assignment	10%
1, 2 and 3	Written Assessment	25%
4	Written Assessment	25%
1, 2, 3 and 4	Written Assessment	40%
	TOTAL	**100%**

COURSE COMPLETION REQUIREMENTS

Course average of at least 50% to pass. NAIT Power Engineering Technology Program requires 80% attendance in theory classes and 100% in power labs. Failure to meet this requirement will result in an incomplete issued.

STUDENT EQUIPMENT AND SUPPLIES

Units One, Two and Seven of PanGlobal 4th Class

DELIVERY METHOD

This course will be taught using a variety of delivery methods which may include face-to-face, online, or blended teaching platforms. Collaborative exercises/assignments, seminars, labs, discussion, audio/visual presentations, case studies, and other such activities may be used to support learning.

STUDENT RESPONSIBILITY

It is expected that students will be responsible citizens of the Institute by following the Student Rights and Responsibilities Policy(SR 1.0). As such, each student will assist in the preservation of Institute property, and assume responsibility for their education by staying informed of and abiding by academic requirements and policies; demonstrating respect toward others; and meet expectations concerning attendance, assignments, deadlines, and appointments.

EQUITY AND INCLUSION STATEMENT

NAIT is committed to advancing equity and to actively and intentionally creating learning environments that promote a sense of belonging and dignity that ensure all people are safe, respected and valued. Acknowledging that every member of the NAIT community has a role in and responsibility to this work, NAIT provides the resources and support necessary for programs, departments and individuals to champion equity, diversity and inclusion and address barriers in meaningful ways.

TERRITORIAL ACKNOWLEDGEMENT

At NAIT, we honour and acknowledge that the land on which we learn, work and live is Treaty Six territory. We seek to learn from history and the lessons that have come before us, and to draw on the wisdom of the First Peoples in Canada. Only through learning can we move forward in truth and reconciliation, and to a better future together.

Leadership Review Date: June 16, 2022