EN310

3rd Class Power Engineering Part A-1

4 Credits

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Reviewer:	Robert Collins
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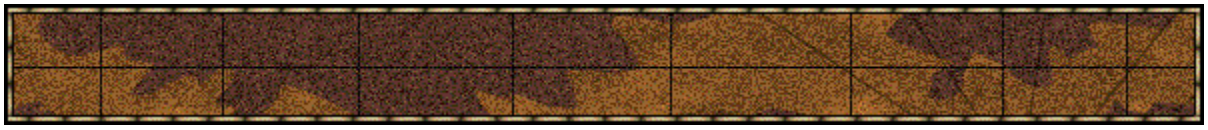
EN310 Version: 5



3rd Class Power Engineering Part A-1

Calendar Description

This course follows the SOPEEC syllabus and curriculum. This course begins with Applied Mechanics, Thermodynamics & Chemistry. Instruction begins with algebraic operations, logarithms and problem solving; trigonometry; mensuration; forces and friction; work, power, energy & linear & angular motion; strength of materials, bending of beams; pressure, density, flow; heat, state change, calorimetry; thermal expansion and heat transfer; steam properties and calculations; gas laws and calculations; chemistry fundamentals; metallurgy and material; corrosion principals and industrial drawings.

Rationale

This is a required course for the Heavy Oil Power Engineering program.

This course is regulated by ABSA (Alberta Boiler Safety Association) which governs any pressure vessel including Boilers. In order to obtain a 3rd Class Certificate you must pass the 3A1 "paper" (exam) by more than 65%. This paper consists of 150 questions which the student must complete in 3.5 hrs. This course is designed to ensure the student has the knowledge and skills to pass the paper.

Prerequisites

EN110, EN114, EN210, & EN 214

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

1. solve problems using algebraic operations, including equations and logarithms.
2. explain trigonometric concepts and solve problems involving trigonometry.
3. solve problems involving the areas of plane figures and the surface areas and volumes of three-dimensional objects..

4. explain concepts and solve problems involving vectors, force systems and friction..
5. explain concepts and solve problems involving work, power, energy, linear motion, and angular motion.
6. explain concepts and solve problems involving material stresses and bending of beams.
7. explain concepts and solve problems involving simple machines and fluids.
8. explain heat terminology and perform heat calculations during changes of state and calorimeter tests.
9. explain concepts and perform calculations involving the thermal expansions of solids and liquids and heat transferred through a substance.
10. define properties of saturated and superheated steam and, using information from the steam tables, calculate the heat required to produce steam at various conditions; determine the evaporation in steam boilers.
11. explain the laws of perfect gases and perform calculations involving the expansion and compression of gases.
12. explain the fundamental principles in the structure, formation and interaction of chemical compounds and the importance of chemistry in industrial operations..
13. explain the Production, Properties, and Applications of Metallic and Non-metallic Materials.
14. explain the mechanisms that cause corrosion and the methods used to monitor and control corrosion.
15. identify and interpret components of typical engineered drawings used in industry.

Resource Materials

***Required Text(s)*:**

Panglobal. (Latest printing was June 2014). *Panglobal Third Class Part A1 Edition 2.0* (or better). Calgary: Panglobal. ISBN13: 978-1-897461-40-2.

***Reference Text(s)*:**

Not needed but nice to have:

William Embleton. (1994). *Reeds Applied Mechanics Volume 2 by Reeds Marine Engineering Series*. Surrey, UK: Thomas Reed Publications. (found on Amazon.ca)

Embelton, W. (1994). *Reeds Applied Heat for Engineers Volume 3 by Reeds Marine Engineering Series.* Surrey, UK: Thomas Reed Publications. (found on Amazon.ca).

Conduct of Course

Course is delivered by classroom instruction that is dedicated to 4 hours per Learning Outcome. Students are then given an assignment delivered using D2L to test the knowledge

gained by each Outcome. The Course is broken down into 4 Units where the student has an exam of roughly 75 questions per Unit Exam. The student also has a 150 question Midterm and Final.

Evaluation Procedures

D2L Assignments	15 %
Unit 1 Exam	12.5%
Unit 2 Exam	12.5%
Assignments	10 %
Midterm	20 %
Final	30 %

Please note: At least a 50% pass mark is required on the final exam to pass this course.

65% is the overall required course mark.

Grade Equivalents and Course Pass Requirements

A minimum grade of C+ (65%) is required to pass this course.

Letter	F	C+	B-	B	B+	A-	A	A+
Percent Range	0-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	2.30	2.70	3.00	3.30	3.70	4.00	4.00

Please note: At least a 50% pass mark is required on the final exam to pass this course.

65% is the overall required course mark.

Attendance

A minimum of 80% attendance is required.

Attendance is recorded at each class. Students must email the instructor to inform them of their absence. If a suitable reason is provided, the absence may be excused when considering the maximum absences allowed.

It is the responsibility of the student to confirm with the instructor, after the class, that they arrived late and could have been missed in the taking of attendance. It is at the discretion of the instructor to counts tardiness as an absence.

Course Units/Topics

Algebraic Operations, Logarithims & Problem Solving

Trigonometry

Mensuration

Friction and Forces

Work, Power, Energy, Linear & Angular Motion

Strength of Materials, Bending of Beams

Simple Machines, Fluid Pressure, Density and Flow

Heat, State of Changes and Colorimeters

Thermal Expansion & Heat transfer

Steam Properties & Calculations

Gas Laws and Calculations

Chemistry and Materials

Metallurgy and Materials

Corrosion Principles

Industrial Drawings

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