



AC Fundamentals – AUST 103 Autonomous Systems Technician Program

Course Outline

COURSE IMPLEMENTATION DATE: September 2020
OUTLINE EFFECTIVE DATE: September 2020
COURSE OUTLINE REVIEW DATE: March 2025

GENERAL COURSE DESCRIPTION:

This course provides the foundation required for the understanding of all electronic circuits with Alternating Current (AC) sources. The characteristics of various AC waveforms are discussed and measured. The concepts and calculations of reactive values are emphasized. The student will study the response to AC of various circuit configurations and apply this knowledge to the analysis of Resistor Capacitor (RC), RL, and RLC circuits. Various practical applications of circuit configurations are explored. Theory is reinforced with hands-on practice and exposure to troubleshooting techniques.

Program Information: This course is required to complete the Autonomous Systems Technician program.

Delivery: This course is delivered face to face.

COTR Credits: 4

Hours for this course: 150 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	75
Seminars / Tutorials	
Laboratory / Studio Hours	75
Practicum / Field Experience	
Other Contact Hours	
Total	150

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-Job Experience	
Formal Work Experience	
Other	
Total	N/A

Course Outline Author or Contact:

Joy Brown, BEd

Signature

APPROVAL SIGNATURES:

Department Head
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Dean of Trades and Technology
Dr. Jack Moes
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Department Head Signature

Dean Signature

EDCO

Valid from: September 2020 – March 2025

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: AUST 102 with a minimum grade of C- (55%) or higher.

Corequisites: N/A

Flexible Assessment (FA):

Credit can be awarded for this course through FA Yes No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio, Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit <http://www.cotr.bc.ca/Transfer>.

Student should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: N/A

Textbooks and Required Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Floyd, Thomas and Buchla, David. *Electronic Fundamentals: A System Approach*.

Buchla, David. *Experiments in DC/AC Fundamentals*.

Autonomous Systems Technician Level 1 Package

Please see the instructor's syllabus or check COTR's online text calculator <http://go.cotr.bc.ca/tuition/tCalc.asp> for a complete list of the currently required textbooks.

LEARNING OUTCOMES:

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

- describe the differences of voltage, current, energy and power in AC versus DC;
 - explain sinusoidal and non-sinusoidal waveform characteristics and values;
 - apply basic circuit laws to analyze resistive circuits with AC inputs;
 - measure the various characteristic values of AC circuits with test equipment;
 - use phasor diagrams to analyze AC circuits;
 - measure the response of various RC, RL, and RLC circuits;
 - analyze the response of various RC RL, and RLC circuits;
 - describe the resonant characteristics of RLC circuits and their applications;
 - construct and measure basic filter configurations;
 - measure and analyze the pulse response of reactive circuits;
 - measure and analyze basic transformer circuits; and
 - troubleshoot faults in AC circuits.
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COURSE TOPICS:

- AC Circuits
- Sinusoidal and non-sinusoidal wave forms
- AC inputs
- RC, RL and RLC Circuits
- Basic filter configurations
- Reactive circuits

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

EVALUATION AND ASSESSMENT (Face-to-Face Delivery):

Assignments	% of Total Grade
Lab Test 1	5%
Lab Test 2	5%
Lab Test 3	5%
Lab Test 4	10%
Lab Test 5	15%
Theory Tests (x4 @10% each)	40%
Final Exam	<u>20%</u>
Total:	100%

Please see the instructor's syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments and use of electronic aids.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor endeavours to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.