



Digital Fundamentals – AUST 106 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 theoretical and practical knowledge necessary for the student to install, maintain, and trouble-shoot circuits that contain digital logic devices. The Binary, Hexadecimal, and Decimal number systems are described, and techniques for converting from one system to another are introduced. Basic definitions and common elements of digital logic devices are introduced and explored. The digital logic devices covered include basic logic gates (AND, OR, NOR, NAND, XOR), logic functions, flip-flops, counters, shift registers, memories, and interfacing integrated circuits. Common representations of digital logic functions and circuits are introduced, including truth tables, waveform representations, schematics, symbols and Boolean expressions. Practical circuits that employ these devices are also studied. The lecture material is reinforced by a series of lab assignments that develop skills in designing and creating prototype circuits using common logic elements.

Program Information: This course is required for the first year of the Autonomous Systems Technician program.

Delivery: This course is delivered face to face.

COTR Credits: 3

Hours for this course: 120 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	60
Seminars / Tutorials	
Laboratory / Studio Hours	60
Practicum / Field Experience	
Other Contact Hours	
Total	120

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
Joy Brown
E-mail: jbrown3@cotr.bc.ca

Dean of Trades and Technology
Dr. Jack Moes
E-mail: jmoes@cotr.bc.ca

Department Head Signature

Dean Signature

EDCO

Valid from: September 2020 – March 2025

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: AUST 105 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 Systems 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

- perform number system conversions between binary, hexadecimal and decimal numbers;
 - describe basic logic gate operations (AND, OR, NOR, NAND, XOR);
 - use AND, OR and INVERTER symbols to represent logic circuits;
 - define NAND, NOR, and XOR logic and symbols;
 - recognize circuits and schematics using digital symbols;
 - use digital data sheets, truth tables and timing diagrams;
 - analyze combinational logic gate functions and applications;
 - explain the operating parameters and characteristics of various logic families;
 - discuss data storage concepts and devices;
 - describe digital-to- analog and analog-to-digital conversions;
 - analyze the operation of digital circuits using timing diagrams; and
 - build and troubleshoot basic digital circuits.
-

COURSE TOPICS:

- Digital logic devices
- Binary, Hexadecimal, decimal number systems
- Basic logic gates-AND, OR, NOR, NAND, XOR
- Digital Logic functions
- Flip flops, counters, shift registers, memories, interfacing integrated 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	10%
Lab Test 4	10%
Lab Test 5	10%
Theory Test (x2@ 15 % each)	30%
Final Exam	<u>30%</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.