WIST-105 – Digital Fundamentals

Technology

Effective Term & Year: Fall 2022
Course Outline Review Date: 2027-03-01

Program Area: Information Technology

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 Wireless Systems Technician program.

Delivery Methods: Hybrid – On-campus (Face-to-Face) and Online

Credit Type: College of the Rockies Credits

Credits: 4

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	75
Seminar/Tutorials	
Laboratory/Studio	75
Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	150

Course Requisites:

- Earned a minimum grade of C- (55%) in each of the following:
  - WIST104 – Electronic Circuits (4)

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at other BC institutions, please see http://www.bctransferguide.ca. All requests for course transfer credit from institutions in BC or elsewhere should go to the College of the Rockies Enrollment Services office.

Textbook 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.*

Wireless Systems Technician program Level 1 Package

Please see the instructor's syllabus or check COTR's online text calculator https://textbook.cotr.bc.ca/ 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 Assessments

Assessment Type: On-Campus (face-to-face) and Online, or Hybrid

Assessment Type	% 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	30%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

No pass requirements available.

Evaluation Notes: A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

Evaluation Notes Comments:

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 Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at https://cotr.bc.ca/about-us/college-policies/ and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.4.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Equivalent Course(s) and Course Code Changes

Prior Course Code: AUST 106, WIST 106

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.