



WIST-202 – Radio Frequency (RF) Transmission Lines and Antennas

Technology

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

Program Area: Information Technology

Description:

This course investigates Radio Frequency (RF) signal propagation in cables and through free space. Concepts related to transmission of the RF signal within cables and causes of transmission impairment are explored. Free space propagation of an RF signal as an Electromagnetic (E/M) field is examined. The properties of RF signals radiated by an antenna system will be explored. RF filtering systems are introduced, including cavity filters. The practical component of this course will include forward and reflected power measurements, Voltage Standing Wave Ratio (VSWR) minimization and Time Domain Reflectometry (TDR) fault location techniques for transmission line systems. Antenna operational parameters will be measured, and cavity filter alignment will be performed.

Program Information:

This course is required for successful completion of the Wireless Systems Technician Diploma program.

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

Credit Type: College of the Rockies Credits

Credits: 3

Instructional Activity and Hours:

Activity	Hours
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Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	45
Practicum/Field Experience	
Co-op/Work Experience	
Other	
Total	90

Course Requisites:

- Earned a minimum grade of C- (55%) in each of the following:
 - [WIST201](#) – Radio Frequency (RF) Principles (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:

Miller, Gary, Beasley, Jeffery and Hymers, Jonathan. *Electronic Communications: A Systems Approach*.

Wireless Systems Technician program Level 2 Lab Manual

Wireless Systems Technician program Level 2 Handout 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

- describe the various types of transmission lines and their applications;
 - explain the concept of characteristic impedance and how it may affect RF transmissions;
 - fabricate and test an RF transmission cable;
 - explain the principles of TDR and VSWR and their applications for cable and antenna testing;
 - perform TDR and VSWR testing on an RF transmission line, including fault location;
 - explain the basics of e/m propagation and radiation patterns;
 - describe the various antenna families and specific applications;
 - build and test a quarter wave antenna for a given frequency; and
 - tune and test a cavity filter system.
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Course Topics:

- Radio Frequency (RF) Signal Propagation
- RF Transmission
- Voltage Standing Wave Ratio (VSWR) Minimization
- Time Domain Reflectometry (TDR)
- Antenna Operation
- Cavity Filter Systems

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
Exams (x2)	65%
Labs	20%
Assignments	15%
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

Pass requirements: None

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 2.5.8 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 203

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.

