UNIVERSITY OF THE FRASER VALLEY

OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE: September 2014
COURSE REVISED IMPLEMENTATION DATE:
COURSE TO BE REVIEWED: September 2020
(six years after UEC approval) *(month, year)*

OFFICIAL UNDERGRADUATE COURSE OUTLINE INFORMATION

Students are advised to keep course outlines in personal files for future use.
Shaded headings are subject to change at the discretion of the department – see course syllabus available from instructor

ENGR 210	Physics	3
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Circuit Analysis
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course is an introduction to circuit analysis, a mathematical model used to represent a variety of engineering problems such as electric circuits. In particular, students will learn about phasor analysis and AC power; transfer functions; Bode plots; filters and resonance; transformers, and two-port networks.

PREREQUISITES: PHYS 112
COREQUISITES:
PRE or COREQUISITES: PHYS 381

SYNONYMOUS COURSE(S):
(a) Replaces:
(b) Cross-listed with:
(c) Cannot take: for further credit.

SERVICE COURSE TO: *(department/program)*

TOTAL HOURS PER TERM: 75

STRUCTURE OF HOURS:

Lectures:	75	Hrs
Seminar:		Hrs
Laboratory:		Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

TRAINING DAY-BASED INSTRUCTION:
Length of course:
Hours per day:

OTHER:
Maximum enrolment: **24**
Expected frequency of course offerings: annually
(every semester, annually, every other year, etc.)

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☒ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)	☐ Yes	☐ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☐ Yes	☒ No

Course designer(s): **Xiaolin Long, Peter Mulhern, Joss Ives**

Department Head:	**Derek Harnett**	Date approved:	**August 26, 2013**
Campus-Wide Consultation (CWC)		Date of meeting:	**June 28, 2013**
Curriculum Committee chair:	**David Fenske**	Date approved:	**September 20, 2013**
Dean/Associate VP:	**Lucy Lee**	Date approved:	**September 20, 2013**
Undergraduate Education Committee (UEC) approval		Date of meeting:	**October 25, 2013**

LEARNING OUTCOMES:

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

- Describe key circuit elements including resistors, capacitors, inductors, and transformers.
- State the fundamental laws (Kirchhoff's Laws) and theorems (Thevenin/Helmholtz's and Norton/Helmholtz's equivalences) needed for circuit design and analysis.
- Analyze electrical circuits containing a variety of circuit elements using the basic laws and theorems.
- Simulate circuits on the computer using appropriate software such as SPICE.
- Calculate both steady state and transient responses in 1st and 2nd order circuits.
- Analyze single and three phase AC circuits.
- Apply both Laplace and Fourier transforms to circuit analysis problems.

METHODS: *(Guest lecturers, presentations, online instruction, field trips, etc.)*

Lectures.

METHODS OF OBTAINING PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

☒ Examination(s) ☐ Portfolio assessment ☐ Interview(s)

☐ Other (specify):

☐ PLAR cannot be awarded for this course for the following reason(s):

TEXTBOOKS, REFERENCES, MATERIALS:

[Textbook selection varies by instructor. An example of texts for this course might be:]

Fundamentals of Electric Circuits (Ed. 5), C. Alexander and M. Sadiku, McGraw-Hill Science/Engineering/Math 2012

SUPPLIES / MATERIALS:

None

STUDENT EVALUATION:

[An example of student evaluation for this course might be:]

Assignments:	20%
Quizzes:	10%
Midterm exam:	25%
Final exam:	45%

COURSE CONTENT:

[Course content varies by instructor. An example of course content might be:]

- Basic circuit variables, Ohm's Law (review)
- Voltage and current sources
- Real source models (Thevenin/Helmholtz's and Norton/Helmholtz's)
- Parallel connection vs. series connection (review)
- Kirchhoff's Laws: Voltage Law (KVL) and Current Law (KCL) (review)
- Modified Nodal Analysis, Loop Analysis.
- 1st order circuits (review)
- 2nd order circuits
- AC circuits including steady-state analysis, power analysis, 3-phase circuits, frequency response
- Two-port networks