UNIVERSITY OF THE FRASER VALLEY

UPAC FORM #2 (Page 1)

COURSE IMPLEMENTATION DATE: September 1993
COURSE REVISED IMPLEMENTATION DATE: September 2010
COURSE TO BE REVIEWED: November 2009
(Four years after UPAC final approval date) (MONTH YEAR)

OFFICIAL 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 and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT: **Faculty of Science, Health & Human Services/Physics**

PHYS 332		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UFV CREDITS

ANALOG ELECTRONICS
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

Physics 332 is an introductory electronic principles and circuit analysis course. This course will cover the following topics: analysis of DC and AC circuits, diodes, bipolar transistors, field effect transistors, transistor amplifiers, operational amplifiers, and power supplies. Students enrolling in this course must also take the accompanying lab course, PHYS 342, in the same semester.

PREREQUISITES: **PHYS 222 or PHYS 232**
Note: As of September 2011, prerequisites will change to the following: PHYS 232
COREQUISITES: **PRE- or COREQUISITES Physics 342**

SYNONYMOUS COURSE(S)
(a) Replaces: **n/a** *(Course #)*
(b) Cannot take: **n/a** *(Course #)* for further credit.

SERVICE COURSE TO: *(Department/Program)* *(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:

MAXIMUM ENROLLMENT: **24**
EXPECTED FREQUENCY OF COURSE OFFERINGS: **Once every two or three years; more often if we offer second year electrical engineering**

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

AUTHORIZATION SIGNATURES:

Course Designer(s): George McGuire; revised P. Mulhern
Chairperson: Gillian Mimmack *(Curriculum Committee)*
Department Head: Norm Taylor
Dean: Dan Ryan
UPAC Approval in Principle Date:
UPAC Final Approval Date: February 26, 2010

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

This course is designed to provide students with:
1. The theory needed to understand and predict how electronic devices will function when placed in circuits;
2. The theory to design and analyze the electronic circuits;
3. The ability to design, run, and test circuits on computer simulators;
4. An appreciation of the importance electronics plays in the lives of Canadians.
5. The ability to solve various problems in each of the topic areas listed in the Calendar Description section.

METHODS:

This course will be presented using lectures, demonstrations, and computer simulations. The use of the computer simulators will permit the students to design and check how their circuits should function when constructed in the lab. The computer simulations will help the students understand and master the electronic principles and circuit theory, as well as provide an appreciation of how important a computer can be to a physicist. Students after successfully completing this course will have a good understanding of basic electronic devices, how computers may be used to model and test electronic circuits (active and passive devices), and the ability to design, construct, and to test circuits.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

Credit can be awarded for this course through PLAR (Please check:) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:

Please see the Physics PLAR policy on the department's webpage

TEXTBOOKS, REFERENCES, MATERIALS:

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

TEXTS: Microelectronic Circuits; Sedra/Smith 4th ed.

REFERENCES:

1. Horowitz and Hill, the Art of Electronics, Cambridge, 1989
2. Simpson, R., Introductory Electronics for Scientists and Engineers, 2nd Ed., Simon & Shuster, 1987
3. Driscoll, F., Analysis of Electric Circuits, Prentice Hall, 1973
4. Fortney, L., Principles of Electronics, HBJ, 1987
5. Roden and Carpenter, Electronic Design, Discovery Press (1997)

SUPPLIES / MATERIALS:

Access to a PC is an advantage.

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

Assignments	20%
Mid-term	20%
Computer Simulations	20%
Final	40%

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

Week 1	Introduction/Overview/Circuit Analysis
Week 2,3	Operational Amplifiers and Applications All of Chapter 2 plus additional material
Week 4,5	Diodes and Semiconductor Physics All of Chapter 3 plus additional material
Week 6,7	Bipolar Junction Transistors All of Chapter 4, some of Chapter 10
Week 8,9	Field Effect Transistors All of Chapter 5
Week 10	Differential Amplifiers
Week 11	Frequency Response
Week 12	Feedback
Week 13	Output and Power Amplifiers