UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE:
COURSE REVISED IMPLEMENTATION DATE: September 2003
COURSE TO BE REVIEWED: September 2007
(Four years after implementation 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: **PHYSICS**

PHYSICS 472		**3**
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

DIGITAL ELECTRONICS LABORATORY
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

Physics 472 is the laboratory portion of the digital electronics course, Physics 462. The experiments done in this course are designed to provide students with practical experience using, testing, and designing digital logic circuits. The experiments are closely related to the material covered in the classroom. This course emphasizes design and assembly of circuits with discrete gates, interfacing these circuits directly to microprocessors, and using industrial production tools for practical applications.

PREREQUISITES: **PHYS 222**
COREQUISITES: **PHYS 462**

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

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

TOTAL HOURS PER TERM: **45**

STRUCTURE OF HOURS:

Lectures:	**45**	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:
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: Art Last; revised E. Camm *(Curriculum Committe*
Department Head: Tim Cooper; revised P. Mulhern
Dean: Wayne Welsh; revised J. Snodgrass
PAC Approval in Principle Date:
PAC Final Approval Date: December 14, 2001

LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:

The experiments in this course are designed to provide students with:
1. the practical experience in using the basic digital gates;
2. digital design experience and how these circuits perform binary mathematics;
3. practical experience in using IC chips
4. the ability to interface digital circuits with common microprocessors

METHODS:

The experiments used in this course will be closely tied to the material covered in the lectures and to the assigned computer simulations. The laboratory is meant to be an integral part of the classroom portion of the course -- it should not be thought of as a separate part of the course. The experiments are needed to provide the practical experience with the logic circuits studied in the classroom. The unique combination of classroom theory, computer simulation, and practical experience should provide the students with the necessary knowledge and the experience to design and test digital electronic circuits. Experiments on computer interfacing will be assigned. Students after successfully completing this course will have a good understanding of digital electronics, microprocessors, computer architecture, and computer interfacing.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):

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

METHODS OF OBTAINING PLAR:

Initial oral discussion
Relevant industrial experience

TEXTBOOKS, REFERENCES, MATERIALS:

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

TEXTS: Miller, Experiments for Digital Computer Electronics, 3rd Ed., McGraw Hill (1993)

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

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

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

The final grade will be awarded on the total number of points earned. There are 21 labs, each marked out of 10, a project worth 60 points, and a final exam worth 30 points, for a total maximum of 300 points. Extra projects can be done for additional credit. I will not mark labs that are handed in later than two weeks past the scheduled lab date.

The marks awarded will be based on the number of points awarded.

A+	279+	A	264 - 278	A-	249 - 263
B+	234 - 248	B	219 - 233	B-	204 - 218
C+	189 - 203	C	174 - 189	C-	159 - 173
P	144 - 158	N.C.	< 144		

COURSE CONTENT:

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

Sept 8 Introduction; techniques, lab manuals, data analysis

		Lab	0: Measurement Techniques
Sept	15	Lab	1: Basic Gates
		Lab	2: Combinations of Gates
Sept	22	Lab	3: Diode and Transistor Logic
		Lab	4: Simple Op-Amp Amplifier
Sept	29	Lab	5: Loading a Gate
		Lab	6: Frequency Response of a Gate
Oct	6	Lab	7: Schmitt Trigger
		Lab	8: Mini-Project
Oct	13	Lab	9: Monostable Multivibrators
		Lab	10: Astable Multivibrators
Oct	20	Lab	11: RS and D Flip-Flops
		Lab	12: JK Flip-Flops
Oct	27	Lab	13: Encoders and Decoders; 7 Segment Display
		Lab	14: Multiplexer
Nov	3	Project	(Work Day #1)
Nov	10	Lab	15: Counters
		Lab	16: Adders
Nov	17	Project	(Work Day #2)
Nov	24	Lab	17: A/D test circuit
		Lab	18: Computer Interface of A/D
Dec	1	Lab	19: Game Port Access
		Lab	20: Printer Port Access
Dec	8	Project	(Work Day #3)