OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

COURSE IMPLEMENTATION DATE:	September 2014
COURSE REVISED IMPLEMENTATION DATE:	
COURSE TO BE REVIEWED: *(six years after UEC approval)*	September 2020 *(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 340	Physics	4
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Micro-Processors and Embedded Systems

COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course covers basic microcomputer architecture; design and analysis of address decoders and memory systems; design and analysis of assembly language programs; and microcomputer system design.

PREREQUISITES: ENPH 320, ENPH 310, COMP 150, or COMP 152
COREQUISITES:
PRE or COREQUISITES:

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:	**45**	Hrs
Seminar:		Hrs
Laboratory:	**30**	Hrs
Field experience:		Hrs
Student directed learning:		Hrs
Other (specify):		Hrs

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

OTHER:
Maximum enrolment: **18**
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**		
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:

- Analyze the architecture of the HCS12 microcontroller.
- Write code using assembly language.
- Design address decoders and memory systems.
- Design parallel and serial interfaces.
- Design D/A and A/D converters.
- Translate from high-level programming languages (e.g., C) to assembly and machine language.
- Design simple embedded systems.
- Work effectively as a team.

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

Lectures and labs

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:]

HCS12 Microcontroller and Embedded Systems (Ed. 1), M. Mazidi and D. Causey, Prentice Hall 2008

SUPPLIES / MATERIALS:

The necessary laboratory equipment will be provided to the students.

STUDENT EVALUATION:

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

Assignments:	15%
Quizzes:	10%
Midterm exam:	20%
Final Exam:	35%
Labs (including write ups):	20%

COURSE CONTENT:

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

1. Basic microcomputer architecture and memory maps
2. Address decoders and memory systems
3. Addressing modes
4. Instruction sets
5. Assembly language
6. Parallel and serial interfaces
7. A/D and D/A converter systems
8. Microcomputer system design
9. Review of object-oriented programming: Data structures, algorithms, and programming techniques.
10. Introduction to embedded systems programming using high level languages (e.g., C).

Laboratory sessions include experiments on microprocessor-based hardware design; assembly and C language program development; programming and interfacing with I/O device; and sessions dedicated to the design and completion of a major laboratory project.