OFFICIAL UNDERGRADUATE COURSE OUTLINE (page 1)

UNIVERSITY OF THE FRASER VALLEY

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 350	Physics	4
COURSE NAME/NUMBER	FACULTY/DEPARTMENT	UFV CREDITS

Sensors and Actuators
COURSE DESCRIPTIVE TITLE

CALENDAR DESCRIPTION:

This course provides an introduction to sensors and actuators for electromechanical, computer-controlled machines, and devices. Topics include operating principles, design considerations, and applications of analog sensors, digital transducers, stepper motors, continuous-drive actuators, and drive system electronics. Component integration and design considerations are studied through examples selected from applications of machine tools, mechatronics, precision machines, robotics, aerospace systems, and ground and underwater vehicles. Laboratory exercises strengthen the understanding of component performance, system design, and integration.

PREREQUISITES: ENGR 330
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:

- Acquire and analyze the data from analog sensors and digital transducers.
- Identify numerous examples of applications of sensors and actuators across a wide variety of fields.
- Demonstrate improved hands-on skills in assembling systems of sensors and actuators.
- Design and evaluate the controllers for the stepper motors and continuous-drive actuators.
- Collaborate in teams to complete projects.
- Communicate orally in an effective manner.

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

Lectures, lab projects, presentations, examinations

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): The course has a lab

TEXTBOOKS, REFERENCES, MATERIALS:

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

Transducer and instrumentation trainer. Progressive Educational Systems.
Control Sensors and Actuators, Clarence W. de Silva, Prentice Hall 1989

SUPPLIES / MATERIALS:

STUDENT EVALUATION:

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

Assignments:	20%
Presentation:	10%
Midterm exam:	10%
Final exam:	30%
Labs (including report):	30%

COURSE CONTENT:

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

1. Basic control systems
2. Input transducers
3. Output transducers
4. Display devices
5. Signal conditioning circuits
6. Closed loop control systems