

Course Title: Course Code:	Embedded Software Engineering ENSE810
Descriptor Start Date:	12/07/2024
POINTS:	15.00
LEVEL:	8
PREREQUISITE/S:	ENEL712 or COMP604
COREQUISITE/S:	None
RESTRICTION/S:	None

LEARNING HOURS

Hours may include lectures, tutorials, online forums, laboratories. Refer to your timetable and course information in Canvas for detailed information.

Total learning hours: 150

PRESCRIPTOR

Advanced techniques for the design, development and implementation of embedded systems including microcontroller programming, operating system configuration, multithreading, sensor and data management, requirements engineering, software design including design notation, version management, software testing.

LEARNING OUTCOMES

- 1. Demonstrate conceptual knowledge of embedded technologies (a).
- 2. Identify an embedded software engineering project topic and analyse the requirements (a, b, h, j).
- 3. Setup the development environment for a group project including a microcontroller and related software and hardware tools and components (a, e, i, j).
- 4. Explain and apply systematic software engineering techniques for software design, software test, project communication and data handling (a j).
- 5. Work collaboratively to plan and conduct a project under technological, environmental and time constraints, and critically assess the project outcomes (a j).
- 6. Research the original use of embedded software and hardware components in the project context (a, b, d, f, h).

Disclaimer: Course descriptors may be amended between teaching periods/semesters

CONTENT

- Definition of embedded systems
- Configuration of hardware and software components of an embedded system
- Setup and configuration of the example embedded microcontroller
- Linux shell usage
- Multithreading
- Sensor and data management
- Software engineering for embedded systems
- Design for hardware and software
- Requirements analysis
- Design and modelling in UML
- Version management
- Python programming

Key to Graduate Capabilities Profile (applicable to AK3751, only):

- a. Engineering knowledge
- b. Problem analysis
- c. Design/development of solutions
- d. Investigation
- e. Tool usage
- f. The engineer and the world
- g. Ethics
- h. Individual and collaborative team-work
- i. Communication
- j. Project management and finance
- k. Lifelong learning

LEARNING & TEACHING STRATEGIES

Lecture classes, laboratory exercises Computer applications Individual and group projects

ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Test	30.00	1
Preliminary group project report	30.00	2, 3, 6
Final group project report and portfolio	40.00	4, 5, 6

Grade Map	MAP1
	A+ A A- Pass with Distinction
	B+ B B- Pass with Merit
	C+ C C- Pass
	D Fail

Overall requirement/s to pass the course:

To pass this course, students must satisfy the stated learning outcomes and achieve a minimum overall grade of C-.

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LEARNING RESOURCES

Richardson, M & Wallace, S (2012). Getting Started with Raspberry Pi (1st ed). Maker Media. Membrey, P (2012). Learn Raspberry Pi with Linux (1st ed). Apress. Sommerville, I. (2010). Software Engineering (9th ed). Harlow, England, New York: Pearson/Addison-Wesley.

For further information, contact: Te Ara Auaha - Faculty of Design & Creative Technologies

Principal Programme:	AK3751, Bachelor of Engineering (Honours)
Related Programme/s:	AK1296 AK1325 AK3566 ICE1 INEXCH1 SABRD1

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