Course Title:	**Embedded Software Engineering**
Course Code:	**ENSE810**
Principal Programme:	**AK3751, Bachelor of Engineering (Honours)**
Related Programme/s:	**AK1296** **AK1325** **AK3566**
Descriptor Start Date:	**01/01/2022**
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: implementing an advanced operating system on an embedded computer, development of high-level hardware-orientated applications using an appropriate language, client-server embedded systems including embedded web server development, system modeling using UML, design patterns for embedded systems, and software engineering for embedded systems.

LEARNING OUTCOMES

1. For given problems, design and develop appropriate scripts to control hardware within an embedded operating system (a, b, c).
2. For a given webserver specification, design and develop an embedded solution using a combination of high-level code and industry standard software (a, b, c, d).
3. Explain and apply the principles of client-server systems (a),
4. Explain and apply the appropriate design patterns to embedded systems (b, e).
5. Describe and apply appropriate UML models and software engineering principles to embedded systems development (b, c, d, e).
6. Work co-operatively within a development team to design an embedded software solution to a supplied specification (c, i, j).

CONTENT

Implementing an embedded operating system.
- Deploying an embedded web-server.
- Developing applications for embedded operating systems.
- Scheduling processes in an embedded operating system.
- Embedded client-server systems.
- UML modelling for embedded systems.
- Design patterns for embedded systems.
- Software engineering for embedded systems.

Key to Graduate Capabilities Profile
a. Engineering knowledge
b. Problem analysis
c. Design/development of solutions
d. Investigation
e. Modern tool usage
f. The engineer and society
g. Environment and sustainability
h. Ethics
i. Individual and team work
j. Communication
k. Project management and finance
l. Lifelong learning

LEARNING & TEACHING STRATEGIES

Lecture classes
Laboratory exercises
Computer applications
Group project

ASSESSMENT PLAN

Assessment Event	Weighting %	Learning Outcomes
Assignment 1	30.00	1-5
Assignment 2	30.00	1-6
Lab progress report	40.00	1-5

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 the course, the student needs at least to gain a minimum grade of C- overall.

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