MCEN90022 Capstone Project

Credit Points:	25
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2015, Parkville This subject commences in the following study period/s: Year Long, Parkville - Taught on campus. Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: Twelve hours of lectures in semester 1 for both semester 1 only and year long enrolled students. Introductory lecture, weekly team meetings with academic supervisor, attendance and participation in Mechanical Project Conference. Expected minimum time commitment per student: eight hours per week. Total Time Commitment: 400 hours
Prerequisites:	One of the following two sets of subjects - BOTH OF:

Subject	Study Period Commencement:	Credit Points:
MCEN90012 Design for Manufacture	Semester 1	12.50
MCEN90013 Design for Integration	Semester 2	12.50

OR BOTH OF:

Note: MCEN90011 Manufacturing Systems may be taken concurrently.

Subject	Study Period Commencement:	Credit Points:
MCEN90024 Mechatronics Design	Semester 2	12.50
MCEN90011 Manufacturing Systems	Semester 1	12.50

Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	None
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Students Experiencing Academic Disadvantage Policy, academic requirements for this subject are articulated in the Subject Description, Subject Objectives, Generic Skills and Assessment Requirements of this entry. The University is dedicated to provide support to those with special requirements. Further details on the disability support scheme can be found at the Disability Liaison Unit website: http://www.services.unimelb.edu.au/disability/
Coordinator:	Dr Colin Burvill
Contact:	**colb@unimelb.edu.au (mailto:colb@unimelb.edu.au)**
Subject Overview:	**AIMS** The subject involves undertaking a substantial project requiring an independent investigation on an approved topic in advanced engineering design or research. Students will present their findings in both professional exhibition and conference podium presentation formats.

	The emphasis of the project can be associated with either: # A well-defined project description, often based on a task required by an external, industrial client. Students will be tutored in the synthesis of practical solutions to complex technical problems within a structured working environment, as if they were professional engineering practitioners; or # A project description that will require an explorative approach, where students will pursue outcomes associated with new knowledge or understanding, within the mechanical science disciplines, often as an adjunct to existing academic research initiatives. It is expected that the Capstone Project will incorporate findings associated with both well-defined professional practice and research principles. **This subject has been integrated with the Skills Towards Employment Program (STEP) and contains activities that can assist in the completion of the Engineering Practice Hurdle (EPH).** EPH is a mandatory requirement for completing the Master of Engineering. **INDICATIVE CONTENT** Topics include: laboratory safety induction, occupational/environmental health & safety, literature searching – for both researcher and engineering practitioner, technical report writing, essay writing, project presentation skills: # Public speaking – both non-technical, casual (exhibition) and technical (conference) # Poster presentation (exhibition)
Learning Outcomes:	On completion of this subject students should be able to apply the knowledge gained in other subjects to successfully investigate a substantially complex engineering design or research problem and have gained experience in collaborative project work, sourcing and collating information that may be associated with disciplines beyond the scope of prior coursework, in developing hypotheses from which engineering decisions will be made, and in reporting contributions arising from project and professional practice activities. **INTENDED LEARNING OUTCOMES (ILOs)** Having completed this subject the student is expected to: 1 Successfully complete a distinct engineering project within the mechanical engineering discipline 2 Effectively communicate the outcomes of various stages of an engineering project 3 Apply standard engineering project management tools 4 Identify standard organisational structures, analyse the relative merits of different approaches, and implement and report on the approach that best suits the strengths of the project team 5 Describe the role of published research, precedent, prior art, patents, registered designs and standards in the engineering project.Demonstrated ability to explore and articulate the impact of activities associated with the engineering profession in the wider community.
Assessment:	Semester 1 only 1. Continuous assessment (20%)Identifies effort, progress and contributions over the entire project cycle. Two interim reports outlining progress relative to the Scope of Works document completed at the outset of the project. Progress Report #1 (10%) will include a review of environmental health and safety issues associated with the project, requiring 35 to 40 hours of work, submitted at the end of week 5 of semester one. Progress Report #2 (10%), requiring 35 to 40 hours of work, is the second interim report submitted at the end of week 9 of semester one (semester one only students) or the beginning of semester two (yearlong students). 2. Final Report (45%) Submitted at the end of the last week of semester one (semester one only students) / mid semester two (yearlong students). The Final Report will be a professional document reporting the findings and contributions of the project team, of no more than 10,000 words (45 pages), excluding appendices of supporting material that can include diagrams, tables, computations and computer output, requiring 170-200 hours of work. The Final Report will include an extended Executive Summary of the important findings contained in the report. 3. Exhibition (10%), requiring 35 to 40 hours of work. Individual assessment. Static display materials (i.e. poster, computer demonstration, prototype) (5%) Non-technical (lay-person) oral examination of no more than 20 minutes (5%) Presented within Conference schedule and static display materials made available for Exhibition held at end of semester two. 4. Conference (15%) requiring 35 to 40 hours of work. Individual assessment. All team members must address the audience. Consider the proceedings as if a professional

	conference. Each team will be allocated 15 minutes and each project will have 5 minutes allocated for questions. 5. Professional Practice (10%), requiring 35 to 40 hours of work. Based on lectures, not exceeding 1500 words per student. Assessment task submitted at the end of week 10 of semester one. HURDLE - All components of the assessment must be satisfactorily completed to pass the subject. INTENDED LEARNING OUTCOMES (ILOs) ASSOCIATED WITH ASSESSMENTSILO 1 will be principally assessed in the final reporting tasks, i.e. Final Report, Exhibition (lay person oral examination) and Conference (technical oral examination) tasks. ILOs 2, 3, 4 and 5 are assessed in all project assessment tasks. ILO 6 is assessed in the professional practice task (essay).
Prescribed Texts:	None
Breadth Options:	This subject is not available as a breadth subject.
Fees Information:	Subject EFTSL, Level, Discipline & Census Date, http://enrolment.unimelb.edu.au/fees
Generic Skills:	On completion of this subject students should have the following skills: # Critical thinking and critical judgement of assumptions adopted # Interpretation and analysis of data # Application of theory to practice # The ability to communicate effectively, not only with engineers but also with the community at large # The ability to utilise a systems approach to design and operational performance # The ability to function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member # An understanding of the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development # An understanding of the principles of sustainable design and development # An understanding of professional and ethical responsibilities and commitment to them # Capacity for independent critical thought, rational inquiry and self-directed learning # Openness to new ideas and unconventional critiques of received wisdom # The ability to apply knowledge of basic science and engineering fundamentals # The ability to undertake problem identification, formulation and solution.
Notes:	**INDICATIVE KEY LEARNING RESOURCES** Students are provided with access to laboratories as appropriate to experimental-based projects, and access to textbooks and journal papers through the library system. **CAREERS / INDUSTRY LINKS** Collaborative Industry projects with external mentors can offer exposure to mechanical, mechatronic and biomechanical engineering in industry, and can offer access to collaborating research and development laboratories. Students are encouraged to select Industry based projects. All students enrolling in the Year Long subject will present project outcomes to an audience of engineering professionals at the public Exhibition scheduled at the end of semester two. Students enrolled in the Semester 1 only subject will present outcomes to an audience of academic staff in a similar informal manner.
Related Majors/Minors/ Specialisations:	B-ENG Mechanical Engineering stream Master of Engineering (Mechanical with Business) Master of Engineering (Mechanical) Master of Engineering (Mechatronics)