FOOD90029 Food Engineering

Credit Points:	12.5
Level:	9 (Graduate/Postgraduate)
Dates & Locations:	2016, Parkville This subject commences in the following study period/s: Semester 1, Parkville - Taught on campus.
Time Commitment:	Contact Hours: 3 x 1 hour lectures + 1 x 1 hour tutorial per week + 2 x 4 hours of laboratory work per semester Total Time Commitment: 200 hours
Prerequisites:	**Subject** / **Study Period Commencement:** / **Credit Points:** CHEN90031 Bioprocess Engineering / Semester 1 / 12.50
Corequisites:	None
Recommended Background Knowledge:	None
Non Allowed Subjects:	**Subject** / **Study Period Commencement:** / **Credit Points:** CHEN90009 Fermentation Processes / Not offered 2016 / 12.50
Core Participation Requirements:	For the purposes of considering request for Reasonable Adjustments under the Disability Standards for Education (Cwth 2005), and Student Support and Engagement Policy, academic requirements for this subject are articulated in the Subject Overview, Learning Outcomes, Assessment and Generic Skills sections of this entry. It is University policy to take all reasonable steps to minimise the impact of disability upon academic study, and reasonable adjustments will be made to enhance a student's participation in the University's programs. Students who feel their disability may impact on meeting the requirements of this subject are encouraged to discuss this matter with a Faculty Student Adviser and Student Equity and Disability Support: http://services.unimelb.edu.au/disability
Coordinator:	Dr Greg Martin
Contact:	Dr Greg Martin Email: gjmartin@unimelb.edu.au
Subject Overview:	**AIMS** This subject will cover the application of chemical engineering principles to modern food processing. This is a specialised elective subject and part of the Biochemical Engineering course that builds on core chemical engineering knowledge and the material presented in the Bioprocess Engineering subject. In this subject, students will develop a broad understanding of the nature food components and materials and the principles underlying their processing. The subject will allow students to learn how to apply chemical and bioprocess engineering knowledge in the design and implementation of important industrial food processes. The principles and technical knowledge developed in this subject are central to chemical engineers working in the food industry. **INDICATIVE CONTENT** Topics will include an overview of processes for preserving and transforming food, fundamentals of food chemistry, bulk food rheological and thermal properties, evaporation and drying, low-temperature preservation, sensory properties, extrusion and product formulation, nutrient delivery and bioavailability. Particular focus will be given to important processed foods such as dairy (cheese, dairy powders, and yoghurt manufacture) and fermented beverages

	(wine and beer production). Emerging technologies including microalgal cultivation for protein and omega-3 production, ultrasound and high-pressure processing, and supercritical fluid extraction will also be covered.
Learning Outcomes:	**INTENDED LEARNING OUTCOMES (ILOs)** Having completed this unit the student is expected to: 1 Understand the biological, chemical and physico-chemical principles underlying food processing and storage 2 Have knowledge of the key functional, sensory, and nutritional properties of food ingredients and how these are affected by processing 3 Apply chemical engineering principles to the design operation of key unit operations used in food processing 4 Solve open-ended engineering design and optimisation problems in food processing 5 Exhibit practical skills in the conduct of laboratory scale experiments related to fermented beverage and dairy product manufacture.
Assessment:	Two practical reports of around 1500 words (20% total, 10% each), due week 5 and week 9, requiring 13 - 15 hours of work each (in addition to the time spent in the laboratory). Intended Learning Outcome (ILO) 5 is addressed in the practical work report One mid-semester test (10%). ILOs 3 and 4 are addressed in the mid-semester test An examination of three hours, held at the end of semester (70%). ILOs 1, 2, 3 and 4 are addressed in the examination. Hurdle Requirement: A mark of 40% or more in the end of semester examination is required to pass the subject
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
Notes:	**LEARNING AND TEACHING METHODS** The subject will be delivered through a combination of lectures and tutorials. In addition, students will also complete two laboratory practicals which will reinforce the material covered in lectures. **INDICATIVE KEY LEARNING RESOURCES** Students will have access to lecture notes and lecture slides. The subject LMS site also contains numerical solutions for tutorial problems. **CAREERS/INDUSTRY LINKS** The skills gained in this subject are crucial to the career of a bioprocess engineer and will be important for students wishing to progress to jobs in the food industry. A number of engineers working in the industry will present lectures.
Related Course(s):	Doctor of Philosophy - Engineering Master of Philosophy - Engineering
Related Majors/Minors/ Specialisations:	B-ENG Chemical and Biomolecular Engineering stream Master of Engineering (Biochemical) Master of Engineering (Chemical)