

Bachelor of Applied Science (Food Technology)

Third-year subjects

202-302 Human Resource Management

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208-305 Production and Management Techniques

Availability: Gilbert Chandler campus

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Said Ajlouni

Contact: Five hours per week (*Semester 1*).

Description: The objective of this subject is to develop a student's ability to use a range of decision-support systems and qualitative techniques for production and management problems.

The content includes control of cost, budget and cost benefit analysis; maintenance control; material and capacity requirements planning; production scheduling and information systems; production facility design and optimisation; decision-making and resource allocation approaches; linear programming and tabular programming; inventory control and marginal analysis; service levels and queuing theory; production and process planning and scheduling; simulation techniques; project network management; and facility location and layout design.

Assessment: Three assignments of 2000 words (20% each); 2-hour examination (40%).

208-310 Analytical Techniques

Availability: Gilbert Chandler campus

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Hubert Roginski

Contact: Five hours per week (*Semester 1*).

Description: The objective of this subject is to develop students' ability to:

- describe the physical, chemical and microbiological principles which underlie rapid and instrumental techniques for testing and analysing raw materials and finished products;
- evaluate innovative instrumental methods for specific purposes and materials against criteria of reliability and validity of results, and of cost and efficiency of monetary and labour resources; and
- select rapid or instrumental methods for analyses appropriate to the type of evaluation or assessment required.

Each of the following types of analytical techniques will be studied in line with the objectives outlined: physical, chemical, and microbiological parameters to be assessed; principles of instrumentation and/or methodology and applications of these principles to the technologies employed in analytical techniques; comparison of instrumental and/or rapid methods to conventional techniques of analysis; operation, calibration and standardisation procedures as applicable to particular techniques; assessment and evaluation of data derived from instrumental and/or rapid methods. Methods to be examined are chromatographic, TLC, HPLC, GLC; ion exchange separations; spectrophotometry, UV, visible, AA; mass spectrometry; serological techniques, FA, ELISA, monoclonal antibody; DNA and RNA technology, probes, PCR; electrophoretic separations; impedance; and industrial and research applications.

Assessment: Laboratory reports (20%); two examinations of 1.5 hours each (40% each).

208-312 Biochemistry and Fermentation Technology

Availability: Gilbert Chandler campus

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Hubert Roginski

Contact: Five hours per week (*Semester 2*).

Description: The objective of this subject is to develop students' ability to:

- describe the energetic balances within the cell and relate these to the nature of biochemical reactions;
- explain the effect of oxygen and substrate influences on the rate and nature of cellular reactions and pathways;
- describe qualitatively the structure and function of enzymes;
- describe the role of DNA and RNA in controlling protein synthesis and explain the significance of DNA to cell characteristics;
- describe the degradative and synthetic pathways for carbohydrates, fats and protein;
- explain the interaction of selected metabolic pathways;

- explain the microbiological biochemical and engineering aspects of industrial fermentations;
- explain the interaction of microbiological, biochemical and engineering factors on the design and operational efficiency of industrial fermentations; and
- evaluate fermentation technologies against criteria of efficiency, economics and environmental impact.

The content includes introduction to biochemistry as important to the micro-organisms in dairy food manufacture and to human nutrition; the nature of biochemically significant compounds; bioenergetics of the cell; the role of ATP, its synthesis in catabolic pathways and use in biosynthesis and transport; ATP formation under aerobic and anaerobic condition; the role of enzymes, co-enzymes and vitamins; enzyme properties and functions as they influence reaction kinetics and thermodynamics of cellular reactions; introduction to structure and replication of DNA and RNA, and protein synthesis; metabolic pathways such as tricarboxylic acid cycle, glycolysis, oxidation of fats, and degradation of amino acids; synthesis of carbohydrates, fats and proteins; regulation of metabolism, cultivation of micro-organisms substrate use and product formation; fed-batch culture; continuous culture, chemostats, cell recycling; biological reactor design; engineering considerations; scale-up and scale-down downstream processing; and products and processes.

Assessment: Two 2-hour examinations (50% each).

208-314 Technology of Food Processing

Availability: Gilbert Chandler campus.

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Hubert Roginski

Contact: Five hours per week (*Semester 1*).

Description: The content includes food additives and preservatives; food preservation; science and technology of manufacture/processing foods; and techniques for evaluation of consumer acceptance.

Assessment: Major assignment 2500 words (30%); two examinations of 1.5 hours each (35% each)

208-315 Research Project

Availability: Gilbert Chandler campus

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Said Ajlouni

Contact: Five hours per week (*Semester 2*).

Description: The objective of this subject is to develop a student's ability to:

- identify a specific problem relevant to the dairy food industry;
- formulate a logical program of investigation directed towards the problem;
- identify important components of the problem;
- select appropriate methodologies to investigate the problem;
- execute a controlled investigation of the problem;
- analyse the results of the investigation quantitatively and evaluate the significance of results obtained;
- prepare a written report of the investigation;
- present orally a summary of the investigation findings; and
- recognise the implications of the investigation findings as they influence technical, economic, environmental, human or political considerations for the industry.

The content includes problem identification, literature review, design and justification of investigation, execution of experimental work, analysis of results, oral presentation of findings, and preparation of written research report.

Assessment: Project proposal and literature review of 3000 words (15%); seminar presentation of proposal (15%); project report of 5000 words (50%); seminar presentation of project report (20%).

208-319 Trends in Food Science and Nutrition

Availability: Gilbert Chandler campus.

Credit points: 12.5

HECS-band: 2

Coordinator: Dr Hubert Roginski

Contact: Five hours per week (*Semester 2*).

Description: The content includes applications of dairy ingredients; fat/protein fraction, bio-active milk fractions; casein applications; functional dairy ingredients; pro-biotic products; developments in food technology; enzyme processing; imitation foods and fat replacement; supercritical extractions; product development concepts and systems; legislation and foods; nutrition cultural trends; social significance; food habits; major nutrient groups; intake, absorption, and dietary balance; calorimetry; energy requirements; food toxicology; chemical residues; natural and synthetic hazards; allergic reactions; role of packaging; packaging materials; product requirements; manufacture

of packaging materials; packaging equipment and processes; testing and quality of packaging; and environmental and waste considerations.

Assessment: Literature review of 3000 words (30%); two industry visit reports of 1000 words (10% each); 2-hour examination (50%).

208-321 Food Safety, Quality and Regulation

See full subject details on page 3.