School of Environmental and Life Sciences

FSHN3230: Food Analysis

Ourimbah
Semester 1 - 2024

COURSE OUTLINE

OVERVIEW

Course Description
Foods are analysed for purposes of trade, compliance, quality assurance, authentication, complaint investigation, nutritional attributes and scientific research. In this course students will undertake and compare various food analysis techniques, followed by analysis, interpretation and presentation of the results. Upon completion of this course, students will have the knowledge and skills to apply and assess the principles and practices required for the analysis of foods.

Academic Progress Requirements
Nil

Requisites
Students must have successfully completed CHEM1110, CHEM1120 and BIOL2011 to enrol in this course.

Assumed Knowledge
Students must have successfully completed a minimum of 140 units.

Contact Hours

Ourimbah
Laboratory *
Face to Face On Campus
3 hour(s) per week(s) for 13 week(s) starting Week 1

Lecture
Face to Face On Campus
2 hour(s) per week(s) for 13 week(s) starting Week 1

Seminar
Face to Face On Campus
3 hour(s) per week(s) for 1 week(s)

* This contact type has a compulsory requirement.

Unit Weighting
10

Workload
Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

CONTACTS

Course Coordinator

Ourimbah
Dr Quan Vuong
Vanquan.Vuong@newcastle.edu.au
(02) 43484124
Consultation: By appointment

Teaching Staff

Other teaching staff will be advised on the course Canvas site.

School Office

School of Environmental and Life Sciences
SO-104 Science Offices
OURIMBAH
CESE-SELS@newcastle.edu.au
(02) 4349 4568 / 4348 4115
9am-5pm (Mon-Fri)

SYLLABUS

Course Content

The course will cover:

1. Sampling techniques and sample preparation for the analysis of food components.
2. The principles, methodology and applications of instrumentation and technology in food analysis.
3. Comparison of advanced analytical techniques with conventional techniques in food analysis.
4. Application of common techniques for analysing food components from specific food products to determine proximate composition.
5. Assessment of data using statistical analysis and reporting of results in a scientific manner

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. Apply valid sampling techniques to food materials having widely diverse properties and volumes;
2. Select appropriate analytical techniques for specific food components;
3. Compare advanced and conventional techniques and instruments to analyse chemical and physical properties of foods;
4. Apply a range of chemical analyses of food components;
5. Analyse, interpret and report on results obtained in a scientific format.

Course Materials

Lecture Materials:

Lecture notes will be uploaded on Canvas.

Recommended Reading:

- Neilsen, Suzanne S. 2017 Food Analysis ed 5 Springer Verlag UK. The e-book can be dowloaded at https://link.springer.com/book/10.1007/978-1-4419-1478-1

COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

Contact Hour Requirements:

- Laboratory Attend 80% of sessions

Course Assessment Requirements:

- Assessment 1 - Laboratory Practicals and Reports: Pass requirement - Must pass this assessment item to pass the course.

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	26 Feb	- Introduction to food analysis. - Design experiment, analysis and report of data - Application of Excel and/or JMP for data analysis	- Lecture: Roles of food analysis, design & conduction of experiment, collection and analysis of data and writing a report. - Lab: Completion of lab induction, Pre-treatment of samples, practice on data analysis using Excel and JMP.	
2	4 Mar	- Understanding on sampling techniques and sample preparation. - Analysis of moisture, water activity and ash content in food.	- Lecture: Sampling techniques and sample preparation. - Lab: Analysis of moisture, water activity and total ash content in food.	
3	11 Mar	- Techniques for analysis of moisture, ash and minerals in food. - Analysis of carbohydrates	- Lecture: Analysis of moisture, ash and minerals in food. - Lab: (1) Analysis of carbohydrates - Part 1 - Extraction of sugars; (2) measurement of moisture and ash content.	Online quiz 1.
4	18 Mar	- Techniques for analysis of carbohydrates, sugars and fibres in food. - Analysis of carbohydrates.	- Lecture: Analysis of carbohydrates, sugars and fibres in food. - Lab: Analysis of total carbohydrates -part 2 - Determination of carbohydrates in food.	Online quiz 2
5	25 Mar	- Techniques for analysis of proteins and amino acids in food. - Analysis of proteins.	- Lecture: Analysis of proteins and amino acids in food. - Lab: Analysis of proteins - Part 1 - Digestion of proteins in food.	Short lab report 1 on moisture and water activity (Friday 5pm).
6	1 Apr	- Techniques for analysis of fat and fatty acids in food. - Analysis of proteins.	- Lecture: Analysis of fat and fatty acids in food. - Lab: (1) Analysis of proteins - Part 2 - Distillation and titration for nitrogen in food.	Online quiz 3.
7	8 Apr	- Techniques for analysis of vitamins in food. - Analysis of sodium in food.	- Lecture: Analysis of vitamins in food. - Lab: Analysis of sodium using AAS	Online quiz 4.
Mid-Semester Recess				

Mid-Semester Recess				
8	29 Apr	- Techniques for analysis of pigments in food. - Analysis of fat in food.	- Lecture: Analysis of pigments in food. - Lab: Analysis of fat - Part 1 - Hydrolysis of fat.	Short lab report 2 on carbohydrates and proteins (Friday 5pm).
9	6 May	- Techniques for analysis of phytochemicals and antioxidant capacity in food. - Analysis of fat in food.	- Lecture: Analysis of phytochemicals and antioxidant capacity in food. - Lab: Analysis of fat - Part 2 - Extraction and determination of fat.	Online quiz 5.
10	13 May	- Techniques for analysis of volatile and aromatic compounds in food. - Analysis of vitamin C in food.	- Lecture: Analysis of volatile and aromatic compounds in food. - Lab: (1) Measurement of fat content; (2) analysis of vitamin C in juices using HPLC.	
11	20 May	- Techniques for analysis of physical properties of food. - Analysis of total phenolic content in food.	- Lecture: Analysis of physical properties of food. - Lab: Analysis of total phenolic content in different types of apples.	Short lab report 3 on ash, sodium and fat content (Tuesday 5pm).
12	27 May	- Group presentation. - Analysis of alcohol content in food.	- Lecture: Group presentation on selected topics. - Lab: Analysis of ethanol in wines using GC system.	Group presentation.
13	3 Jun	- Applications of food analysis in research, government, trade and the food industry. - Revision - In class exam (Online quiz)	- Lecture: Applications of food analysis in research, government, trade and the food industry. - Revision, Q & A. - In class exam	- Full lab report (Friday 5pm). - In class exam (Online quiz)
Examination Period				
Examination Period				

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Laboratory Practicals and Reports*	Due date for short lab and full lab reports is mentioned in the Schedule.	Individual	50%	1, 4, 5
2	Online Quiz	The quiz will be opened online for about a week of the designated week as shown in the schedule, and students have 30min to complete each quiz in one go.	Individual	10%	1, 2, 3
3	Presentation	During the lecture time in week 12.	Group	15%	2, 3
4	In Class Examination	Week 13– See details on Canvas	Individual	25%	1, 2, 3, 4

* This assessment has a compulsory requirement.

Late Submissions The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

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Assessment 1 - Laboratory Practicals and Reports

Assessment Type	Tutorial / Laboratory Exercises
Purpose	To demonstrate competency of students in conduction of experiments, analysis of data and writing the reports.
Description	Students are required to submit 3 short lab reports (25% of total marks) and a full lab report (25% of total marks). Short lab report 1: 5%; short lab report 2: 10%: and short lab report 3: 10%. A full lab report is developed from the 3 short lab reports.
Weighting	50%
Compulsory Requirements	Pass requirement - Must pass this assessment item to pass the course.
Due Date	Due date for short lab and full lab reports is mentioned in the Schedule.
Submission Method	Online Students are required to email the report with a cover sheet to the lecturer by the due date.
Assessment Criteria	Assessment is based on the rubric, which is uploaded on Canvas.
Return Method	Online
Feedback Provided	Online - Feedback is given to students approximately one week via email after submission for short lab reports and two weeks for the full lab report.
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 2 - Online Quiz

Assessment Type	Quiz
Purpose	To assist students in understanding the concept of different techniques for analysis of food components.
Description	Online quizzes are in the form of multiple-choice questions. There are total 5 quizzes. Each quiz has 10 questions, and accounts for 2% of total marks.
Weighting	10%
Length	Each quiz has 10 multiple choice questions.
Due Date	The quiz will be opened online for about a week of the designated week as shown in the schedule, and students have 30min to complete each quiz in one go.
Submission Method	Online
Assessment Criteria	Correct Answers.
Return Method	Not Returned
Feedback Provided	No Feedback
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 3 - Presentation

Assessment Type	Presentation
Purpose	To assist students, improve their skills in searching and interpreting the right technique for analysis of a component from a specific food and also improve their presentation skills in class.
Description	Students will work in group. Each group will be given a specific topic related to food analysis and the group will present all information related to the topic in Class. Students will be given the topics for selection in week 2.
Weighting	15%
Length	Maximum 15 min for presentation and 5 min for Q&A
Due Date	During the lecture time in week 12.
Submission Method	In Class .
Assessment Criteria	Assessment is based on a given rubric
Return Method	Not Returned
Feedback Provided	No Feedback
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

Assessment 4 - In Class Exam (individual)

Assessment Type	In Term Test
Purpose	To evaluate students in all learning activities.

Description	Students have 2 hours to answer 60 multiple choice questions, which cover the entire content of the course.
Weighting	25%
Due Date	Week 13– See details on Canvas
Submission Method	Online
Assessment Criteria	Correct answers
Return Method	Online
Feedback Provided	No Feedback
Opportunity to Reattempt	Students WILL NOT be given the opportunity to reattempt this assessment.

ADDITIONAL INFORMATION

Grading Scheme

This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

*Skills are those identified for the purposes of assessment task(s).

Communication Methods

Communication methods used in this course include:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.
- Face to Face: Communication will be provided via face to face meetings or supervision.

Course Evaluation

Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.

Oral Interviews (Vivas)

As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the Oral Examination (viva) Procedure. In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the Student Conduct Rule.

Academic Misconduct

All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in

all locations. For the Student Academic Integrity Policy, refer to https://policies.newcastle.edu.au/document/view-current.php?id=35.

Adverse Circumstances

The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:

1. the assessment item is a major assessment item; or
2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at https://policies.newcastle.edu.au/document/view-current.php?id=236

Important Policy Information

The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures that support a safe and respectful environment at the University.

This course outline was approved by the Head of School. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.