

# FOOD3020, FOOD8020

Food Properties and Functions Laboratory

Term 1, 2022



## Course Overview

### Staff Contact Details

#### Convenors

Name	Email	Availability	Location	Phone
Alice Lee	<a href="mailto:alice.lee@unsw.edu.au">alice.lee@unsw.edu.au</a>	Tuesday 10:00 am - 2:00 pm, Thursday 10:00 am - 2:00 pm	Science and Engineering Building (E8), Room 409	02-93854363

#### Lecturers

Name	Email	Availability	Location	Phone
Alison Jones	<a href="mailto:alison.jones@unsw.edu.au">alison.jones@unsw.edu.au</a>	Tuesday 10:00 am - 2:00 pm, Thursday 10:00 am - 2:00 pm	Science and Engineering Building (E8), Room 433	02-93855745

#### Lab Staff

Name	Email	Availability	Location	Phone
Richard Li	<a href="mailto:richard.li@unsw.edu.au">richard.li@unsw.edu.au</a>	Tuesday 10:00 am - 2:00 pm, Thursday 10:00 am - 2:00 pm	Science and Engineering Building (E8), Room 114	

### School Contact Information

For assistance with enrolment, class registration, progression checks and other administrative matters, please see [the Nucleus: Student Hub](#). They are located inside the Library – first right as you enter the main library entrance. You can also contact them via <http://unsw.to/webforms> or reserve a place in the face-to-face queue using the UniVerse app.

If circumstances outside your control impact on submitting assessments, Special Consideration may be granted, usually in the form of an extension or a supplementary assessment. Applications for Special Consideration must be submitted [online](#).

For course administration matters, please contact the Course Coordinator.

## Course Details

### Units of Credit 6

### Summary of the Course

FOOD3020 and FOOD8020 are laboratory-based, introducing the properties and functions of dairy, meat, fish, fruit, vegetables, beverages, eggs, sugars, cereals, and lipids as food ingredients. The need for preservation is demonstrated through physical, chemical and biological deterioration factors and water relationships. Food technologies introduced in these courses include heating, chilling, freezing, drying, brining, pickling, sugar, packaging (MAP and CAP), chemical preservatives and novel methods.

These are extended to structured inspections (field trips) of a variety of food processing establishments such as food companies, production areas and food research institutes and stations within Sydney, NSW and interstate. The aim is to support student learning of the structure, practical operation and management of the local food industry and to demonstrate how theoretical concepts in food science and technology are applied in a commercial situation. The field trips will take place either in Week 0 or during the term pending the COVID situation.

### Course Aims

The overall aim of these courses is to **develop students' foundational knowledge of the food technology involved in the handling, preservation, and processing of key commodities/ingredients and their products**. More specifically, this course aims:

- to evaluate the properties, processing characteristics, and functional properties of major food ingredients;
- to study methods and techniques used in the food industry for extending the storage and/or shelf life of these ingredients;
- to investigate factors influencing organoleptic and keeping qualities of the ingredients and their products;
- to develop technical/scientific report writing and teamwork skills; and
- to develop and demonstrate leadership and teamwork skills.

### Course Learning Outcomes

After successfully completing this course, you should be able to:

Learning Outcome	EA Stage 1 Competencies
1. Demonstrate sound knowledge of the functional properties, preservation and processing of major food ingredients	PE1.3
2. Describe the major factors that affect the functionality of the food ingredients and quality of the resulting food products	PE1.1
3. Exercise critical judgment with respect to scientific information	PE2.1
4. Communicate scientific information in a specific style	PE3.4
5. Develop leadership and teamwork skills	PE3.6

FOOD3020 is part of the UNSW Food Science specialisations accredited (2021-2026) by the **Institute of Food Technologists Higher Education Review Board (IFT HERB)**.

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**The course learning outcomes, therefore, have been mapped against the IFT Essential Learning Outcomes as follows:**

- FC.2. Explain the chemistry underlying the properties and reactions of various food components.
- FC.3. Apply food chemistry principles used to control reactions in foods.
- FC.4. Demonstrate laboratory techniques common to basic and applied food chemistry.
- FM.2. Describe the conditions under which relevant pathogens are destroyed or controlled in foods.
- FM.4. Explain the principles involved in food preservation via fermentation processes.
- FE.6. Explain the effects of preservation and processing methods on product quality.
- FE.7. List properties and uses of various packaging materials and methods.
- CM.1. Write relevant technical documents.
- PL.1. Demonstrate the ability to work independently and in teams.

## **Teaching Strategies**

These courses will achieve the course objectives via a laboratory oriented format. The student will have the opportunity to test the concepts in the preservation of food ingredients and the science supporting such concepts through hands-on activity in the laboratory setting. Through the various learning activities, students will also acquire and strengthen several crucial generic attributes, including management, informal oral communication, information literacy, technical writing, leadership and teamwork.

## **Additional Course Information**

- FOOD3020 and FOOD8020 are laboratory-based courses, run concurrently with the lecture-based FOOD3010 and FOOD8010. Students are encouraged to take both FOOD3010/8010 and FOOD3020/8020 to maximise their learning outcomes.
- These courses consist of 4 hours of class contact hours per week.
- Assumed knowledge includes food chemistry, food microbiology and basic food processing/ food preservation.

## Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Laboratory Reports	70%	Weeks 3, 4, 5, 7, 8, 9, 10	1, 2, 3, 4, 5
2. Laboratory Quizzes	30%	Weeks 7 and 10	1, 2

### Assessment 1: Laboratory Reports

**Submission notes:** Please submit one e-copy per group through the Moodle submission portal.

**Due date:** Weeks 3, 4, 5, 7, 8, 9, 10

Report writing is a skill to be acquired by students during their undergraduate years. These skills are essential in the professional undertakings of a food technologist. This assessment item is designed to develop as well as to assess your ability to retrieve and process information from literature and other sources, interpret and present experimental data, and report the findings. It forms an integral part of the learning strategies for this course.

This is not a Turnitin assignment

#### Additional details

It is expected that all the group members will participate and contribute equally to the laboratory experiments, engage in the discussion of experimental results either in the class or outside the class and contribute to the completion of the lab reports.

You are required to submit one report for each laboratory class. There are four compulsory reports and 4 optional reports. You are required to submit 4 compulsory reports and a minimum of 2 optional reports. Four compulsory + 2 optional reports with the best marks will be counted towards your final marks.

### Assessment 2: Laboratory Quizzes

**Due date:** Weeks 7 and 10

The laboratory tests are designed to test your understanding of the theories and principles behind the experiments, analytical methodologies and the interpretation of experimental results.

This is not a Turnitin assignment

## Attendance Requirements

Attendance is compulsory for this course. It is expected that all the group members will participate and contribute equally to the laboratory experiments, engage in the discussion of experimental results either in the class or outside the class and contribute to the completion of the lab reports. Absence from a laboratory session (without prior special consideration) will forfeit your right to submit a laboratory report. As this is a laboratory-based course, 100% attendance is one of the criteria to pass this course, unless you have special consideration.

## Course Schedule

[View class timetable](#)

### Timetable

Date	Type	Content
Week 1: 14 February - 18 February	Laboratory	<b>Introduction, Lab induction &amp; Fermentation of Sauerkraut (post-lab activity)</b> <ul style="list-style-type: none"><li>• Lab induction including COVID safe training, equipment training, and introduction to assessment tasks and report writing</li><li>• Laboratory: Fermentation of Sauerkraut (post-lab activity)</li></ul>
Week 2: 21 February - 25 February	Laboratory	<b>Laboratory: Milk</b> <i>Fermentation post-lab activity</i> <i>Introduction to assessment tasks and report writing (Q and A)</i>
Week 3: 28 February - 4 March	Laboratory	<b>Laboratory: Fats and Oils</b> <i>Fermentation post-lab activity</i> <i>Compulsory Report Due (Milk)</i>
Week 4: 7 March - 11 March	Laboratory	<b>Laboratory: Minimal Processing of Fruit and Vegetables (post-lab activity)</b> <i>Compulsory Report Due (Fats and Oils)</i>
Week 5: 14 March - 18 March	Laboratory	<b>Laboratory - Flour (post-lab activity)</b> <i>Fruits and vegetables post-lab activity</i> <i>Optional Report Due (Fermentation)</i>
Week 6: 21 March - 25	Fieldwork	<b>Flexibility week (no new laboratory)</b>

March		<i>Factory Visits (if COVID situation permits)</i>
Week 7: 28 March - 1 April	Laboratory	<b>Laboratory: Meat processing technology</b> <i>Flour post-lab activity</i> <i>Compulsory Report Due (Fruits and Vegetables)</i> <i>Class Quiz 1</i>
Week 8: 4 April - 8 April	Laboratory	<b>Laboratory - Eggs</b> <i>Compulsory Report Due (Flour)</i>
Week 9: 11 April - 15 April	Laboratory	<b>Laboratory - Sugar</b> <i>Optional Reports Due (Meat and Eggs)</i>
Week 10: 18 April - 22 April	Laboratory	<b>Laboratory - Jam Processing</b> <i>Optional Report (Eggs and Sugar)</i> <i>Class Quiz 2</i>

## Resources

### Prescribed Resources

The e-laboratory manual will be made available in Moodle. Please bring a hard copy of the lab manual to every class.

### Recommended Resources

*There is no single textbook that covers all the material given in this course. There is a comprehensive list of reading material listed in the e-laboratory manual for each chapter:*

*Excellent research and review articles discussing topics covered in this course are available from a range of journals. Students aiming for higher grades should consult these journals as well as chapters in the reference texts. Some of the key journals are:*

- *Food Technology*
- *Trend in Food Science and Technology*
- *Journal of Cereal Science*
- *Journal of Food Science*
- *Journal of Meat Science*
- *Food Chemistry*
- *Postharvest Biology and Technology*

*All these journals can be accessed electronically through the UNSW Library. A comprehensive list of useful references for each laboratory session is included in the laboratory notes of the manual.*

*Students seeking resources can also obtain assistance from the UNSW Library.*

### Course Evaluation and Development

Feedback on the course is gathered periodically using various means, including the UNSW myExperience process, informal discussion in the final class for the course, and the School's Student/Staff meetings. Your feedback is taken seriously, and continual improvements are made to the course based, in part, on such feedback.

### Laboratory Workshop Information

Our new purpose-built Food Science and Technology Laboratory in SEB Lab 123 is comprised of a general food teaching space, a sensory laboratory with a preparation area, and a dedicated food teaching analytical lab, with a combined floor space of over 227 m<sup>2</sup>.

The general food teaching space is equipped with 6 induction cooktops and ovens, food processing equipment and cooking utensils, industrial extraction hoods, industrial food storage fridges and freezers, an industrial oven, blast chiller, vacuum sealers, can sealer, incubators, fermentation equipment, heat and fluid teaching equipment (modular, stored below benches) and most importantly capacity for demonstrating forms of typical food preparation for the major food groups.

**Sensory laboratory:** 6 sensory booths with white lighting (attached to general food teaching space),

preparation kitchen, fridge, sinks and benches.

**Food teaching analytical laboratory:** texture analyser, rapid visco-analyser (RVA), vibrational viscometer, Brookfield viscometer, ethanol analyser, phase contrast and stereo microscopy, rotary evaporator, moisture analyser, colorimeter, RH meter, analytical balance, pH meter, refractometers and centrifuges.

## Submission of Assessment Tasks

In the School of Chemical Engineering, all written work will be submitted for assessment via Moodle unless otherwise specified. Attaching cover sheets to uploaded work is generally not required; when you submit work through Moodle for assessment you are agreeing to uphold the Student Code.

Some assessments will require you to complete the work online and it may be difficult for the course coordinator to intervene in the system after the due date. You should ensure that you are familiar with assessment systems well before the due date. If you do this, you will have time to get assistance before the assessment closes.

All submissions are expected to be neat and clearly set out. Your results are the pinnacle of all your hard work and should be treated with due respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect.

Marking guidelines for assignment submissions will be provided at the same time as assignment details to assist with meeting assessable requirements. Submissions will be marked according to the marking guidelines provided.

### Late penalties

Unless otherwise specified, submissions received after the due date and time will be penalised at a rate of 5% per day or part thereof (including weekends). For some activities including Moodle quizzes and Team Evaluation surveys, extensions and late submissions are not possible.

### Special consideration

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to submitting an assessment or sitting an exam.

UNSW has a [Fit to Sit / Submit rule](#), which means that if you attempt an exam or submit a piece of assessment, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's [Special Consideration page](#).

**Please note** that students will need to provide some documentary evidence to support absences from any assessments missed because of COVID-19 public health measures such as isolation. UNSW will **not** be insisting on medical certificates for COVID-related absences of 7 days or less, with the positive PCR or RAT result being sufficient. Longer absences due to self-isolation or COVID-related illness will still need documentation such as a medical certificate.

Applications for special consideration **will still be required** for assessment and participation absences related to COVID-19. Special consideration requests should not be lodged for missing classes if there are no assessment activities in that class.

## Academic Honesty and Plagiarism

**Academic integrity** is fundamental to success at university. Academic integrity can be defined as a commitment to six fundamental values in academic pursuits: honesty, trust, fairness, respect, responsibility and courage (International Center for Academic Integrity, 'The Fundamental Values of Academic Integrity', T. Fishman (ed), Clemson University, 2013). At UNSW, this means that your work must be your own, and others' ideas should be appropriately acknowledged. If you don't follow these rules, plagiarism may be detected in your work.

Further information about academic integrity and plagiarism can be located at:

- The [Current Students site](#)
- The [ELISE training site](#)

The Conduct and Integrity Unit provides further resources to assist you to understand your conduct obligations as a student: <https://student.unsw.edu.au/conduct>.

**Referencing** is a way of acknowledging the sources of information that you use to research your assignments. You need to provide a reference whenever you draw on someone else's words, ideas or research. Not referencing other people's work can constitute plagiarism. Further information about referencing styles can be located at <https://student.unsw.edu.au/referencing>.

For assessments in the School of Chemical Engineering, we recommend the use of referencing software such as [Mendeley](#) or [EndNote](#) for managing references and citations. Unless required otherwise specified (i.e. in the assignment instructions) students in the School of Chemical Engineering should use either the APA 7th edition, or the American Chemical Society (ACS) referencing style as canonical author-date and numbered styles respectively.

## Academic Information

To help you plan your degree, assistance is available from academic advisors in [The Nucleus](#) and also in the [School of Chemical Engineering](#).

### Additional support for students

- [Current Student Gateway](#)
- [Engineering Current Student Resources](#)
- [Student Support and Success](#)
- [Academic Skills](#)
- [Student Wellbeing, Health and Safety](#)
- [Equitable Learning Services](#)
- [IT Service Centre](#)

### Course workload

Course workload is calculated using the Units-Of-Credit (UOC). The normal workload expectation for one UOC is approximately 25 hours per term. This includes class contact hours, private study, other learning activities, preparation and time spent on all assessable work.

Most coursework courses at UNSW are 6 UOC and involve an estimated 150 hours to complete, for both regular and intensive terms. Each course includes a prescribed number of hours per week (h/w) of scheduled face-to-face and/or online contact. Any additional time beyond the prescribed contact hours should be spent in making sure that you understand the lecture material, completing the set assignments, further reading, and revising for any examinations.

### On-campus class attendance

Physical distancing recommendations must be followed for all face-to-face classes. To ensure this, only students enrolled in those classes will be allowed in the room. Class rosters will be attached to corresponding rooms and circulated among lab demonstrators and tutors. No over-enrolment is allowed in face-to-face class. Students enrolled in online classes can swap their enrolment from online to a **limited** number of on-campus classes by Sunday, Week 1.

In certain classroom and laboratory situations where physical distancing cannot be maintained or the staff running the session believe that it will not be maintained, face masks will be designated by the course coordinator as **mandatory PPE** for students and staff. Students are required to bring and use their own face mask. Mask can be purchased from IGA Supermarket (Map B8, Lower Campus), campus pharmacy (Map F14, Middle Campus), the post office (Map F22, Upper Campus) and a vending machine in the foyer of the Biological Sciences Building (Map E26, Upper Campus).

Your health and the health of those in your class is critically important. You must stay at home if you are sick or have been advised to self-isolate by [NSW health](#) or government authorities. Current alerts and a list of hotspots can be found [here](#). Do not come to campus if you have any of the following symptoms: fever (37.5 °C or higher), cough, sore throat, shortness of breath (difficulty breathing), runny nose, loss of taste, or loss of smell. If you need to have a COVID-19 test, you must not come to campus and remain in self-isolation until you receive the results of your test.

**You will not be penalised for missing a face-to-face activity due to illness or a requirement to self-**

**isolate.** We will work with you to ensure continuity of learning during your isolation and have plans in place for you to catch up on any content or learning activities you may miss. Where this might not be possible, an application for fee remission may be discussed. Further information is available on any course Moodle or Teams site.

For more information, please refer to the FAQs: <https://www.covid-19.unsw.edu.au/safe-return-campus-faqs>

## **Image Credit**

Dr Peter Wich

## **CRICOS**

CRICOS Provider Code: 00098G

## **Acknowledgement of Country**

We acknowledge the Bedegal people who are the traditional custodians of the lands on which UNSW Kensington campus is located.

## Appendix: Engineers Australia (EA) Professional Engineer Competency Standard

Program Intended Learning Outcomes	
Knowledge and skill base	
PE1.1 Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline	✓
PE1.2 Conceptual understanding of the mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline	
PE1.3 In-depth understanding of specialist bodies of knowledge within the engineering discipline	✓
PE1.4 Discernment of knowledge development and research directions within the engineering discipline	
PE1.5 Knowledge of engineering design practice and contextual factors impacting the engineering discipline	✓
PE1.6 Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice in the specific discipline	
Engineering application ability	
PE2.1 Application of established engineering methods to complex engineering problem solving	✓
PE2.2 Fluent application of engineering techniques, tools and resources	
PE2.3 Application of systematic engineering synthesis and design processes	
PE2.4 Application of systematic approaches to the conduct and management of engineering projects	
Professional and personal attributes	
PE3.1 Ethical conduct and professional accountability	
PE3.2 Effective oral and written communication in professional and lay domains	✓
PE3.3 Creative, innovative and pro-active demeanour	
PE3.4 Professional use and management of information	✓
PE3.5 Orderly management of self, and professional conduct	
PE3.6 Effective team membership and team leadership	✓