FOOD3020, FOOD8020

Food Properties and Functions Laboratory

Term 1, 2023

Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Alice Lee	alice.lee@unsw.edu.au	Wednesday 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	alison.jones@unsw.edu.au	Wednesday 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	richard.li@unsw.edu.au	Wednesday 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.

Questions about the this course should normally be asked during the scheduled class so that everyone can benefit from the answer and discussion.

Course Details

Units of Credit 6

Summary of the Course

This is a laboratory-based course introducing major food commodities such as dairy, meat, fish, fruit, vegetables, beverages, eggs, sugars, cereals and lipids. Food preservation principles are demonstrated by physical, chemical and biological deterioration factors and water relationships. Technologies covered in these courses are heating, chilling, freezing, drying, brining, fermentation, sugar, packaging (MAP and CAP), chemical preservatives and novel methods. The course also includes structured inspections (i.e., site visits) of various food processing establishments including novel food farms, food manufacturers, food research institutes and analytical services companies within Sydney, NSW as well as interstate.

The aim is to strengthen student understanding of the structure, practical operation and management of the local food industry and to demonstrate how theoretical concepts in food science and technology are implemented in a commercial situation. The important linkage between the technical aspects of food manufacturing and the business requirements of food companies will be explored.

Both components of the course (site visits + laboratory) must be completed as part of the course.

Course Aims

This course aims to develop in-depth knowledge of the properties and functions of several primary food ingredients essential in the food technologies involved in the handling, preservation and processing, through hands-on activities and industry engagement.

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 methods of the major food ingredients	PE1.3
2. Describe the major factors that may affect the functionality of the food ingredients and quality of their products	PE1.1
3. Exercise critical thinking and 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).**

The course learning outcomes, therefore, have been aligned with 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

The aim and objectives of FOOD3020/8020 will be achieved via laboratory-based learning and industry engagement activities (i.e., site visits).

You will have the opportunity to test the food preservation concepts and the science supporting such concepts through hands-on activities in the laboratory setting. Through the various learning activities, you will also acquire and strengthen several crucial attributes These include technical skills, project management, informal oral communication, information literacy, technical writing, leadership and teamwork.

Additional Course Information

- FOOD3020 and FOOD8020 are laboratory-based courses, that run concurrently with the lecture-based FOOD3010 and FOOD8010. You are encouraged to take both FOOD3010/8010 and FOOD3020/8020 to maximise your learning outcomes.
- These courses consist of 4 hours of class contact hours per week.
- Assumed knowledge is 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, 3, 4, 5

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 an important skill to be acquired during your studies. These skills are critical in your professional career as a food technologist. This assessment item is designed to develop and assess your ability to retrieve and process information from the literature and other sources to support the study principles or hypothesis, interpret and present experimental data appropriately, and report the findings in a scientific manner (appropriately fit-for-purpose). It forms an integral part of the learning strategies for this course.

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

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.

There are 4 compulsory reports and 4 optional reports. You are required to submit minium 6 reports (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, for example, the theories and principles behind the experiments, methodologies and the interpretation of experimental results.

This is not a Turnitin assignment

Attendance Requirements

Attendance is compulsory for this course. All of the team members must 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: 13 February - 17 February	Laboratory	**Introduction, Lab induction & Fermentation of Sauerkraut (post-lab activity)** • *Lab induction including COVID safe training, equipment training, and introduction to assessment tasks and report writing* • *Laboratory: Fermentation of Sauerkraut (post-lab activity)*
Week 2: 20 February - 24 February	Laboratory	**Laboratory: Milk** *Fermentation post-lab activity* *Introduction to assessment tasks and report writing*
Week 3: 27 February - 3 March	Laboratory	**Laboratory: Fats and Oils** *Fermentation post-lab activity* *Compulsory Report Due (Milk)*
Week 4: 6 March - 10 March	Laboratory	**Laboratory: Minimal Processing of Fruit and Vegetables (post-lab activity)** *Compulsory Report Due (Fats and Oils)*
Week 5: 13 March - 17 March	Laboratory	**Laboratory - Flour (post-lab activity)** *Fruits and vegetables post-lab activity* *Optional Report Due (Fermentation)*
Week 6: 20 March - 24	Fieldwork	**Flexibility week (no new laboratory)**

March		*Site Visits*
Week 7: 27 March - 31 March	Laboratory	**Laboratory: Egg** *Flour post-lab activity* *Compulsory Report Due (Fruits and Vegetables)* *Class Quiz 1*
Week 8: 3 April - 7 April	Laboratory	**Laboratory - Meat Processing Technology** *Compulsory Report Due (Flour)*
Week 9: 10 April - 14 April	Laboratory	**Laboratory - Sugar** *Optional Reports Due (Meat and Eggs)*
Week 10: 17 April - 21 April	Laboratory	**Laboratory - Jam Processing** *Optional Report (Eggs and Sugar)* *Class Quiz 2*

Resources

Prescribed Resources

The e-laboratory manual will be made available in Moodle. The hard copy of laboractory manual can be purchased from the UNSW bookshop. 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 these courses. 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.

Leganto (accessible through course Moodle) lists recommended reading materials and reference books for the courses.

Students seeking other 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 m2.

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 not required unless specifically requested for an individual assessment task; 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 respect. Presenting results clearly gives the marker the best chance of understanding your method; even if the numerical results are incorrect. Please make it easy for the markers who are looking at your work to see your achievement and give you due credit.

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) and will not be accepted more than 5 days late. For some activities including Exams, Quizzes, Peer Feedback, 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 for **all** special consideration requests (including COVID-19-related requests), students will need documentary evidence to support absences from any classes or assessments.

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.

To help describe what we are looking for, here are some things that we consider to be quite acceptable (even desirable!) actions for many assessments, and some that we consider to be unacceptable in most circumstances. Please check with the instructions for your assessments and your course coordinator if you're unsure. As a rule of thumb, if you don't think you could look the lecturer in the eye and say "this is my own work", then it's not acceptable.

Acceptable actions	Unacceptable actions
✓ reading/searching through material we have given you, including lecture slides, course notes, sample problems, workshop problem solutions	✗ asking for help with an assessment from other students, friends, family
✓ reading/searching lecture transcripts	✗ asking for help on Q&A or homework help websites
✓ reading/searching resources that we have pointed you to as part of this course, including textbooks, journal articles, websites	✗ searching for answers to the specific assessment questions online or in shared documents
✓ reading/searching through your own notes for this course	✗ copying material from any source into your answers
✓ all of the above, for any previous courses	✗ using generative AI tools to complete or substantially complete an assessment for you
✓ using spell checkers, grammar checkers etc to improve the quality of your writing	✗ paying someone else to do the assessment for you
✓ studying course material with other students	

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.

Artificial intelligence tools such as ChatGPT, CodePilot, and built-in tools within Word are modern tools that are useful in some circumstances. In your degree at UNSW, we're teaching you skills that are needed for your professional life, which will include how to use AI tools responsibly plus lots of things that AI tools cannot do for you. AI tools already are (or will soon be) part of professional practice for all of us. However, if we were only teaching you things that AI could do, your degree would be worthless, and you wouldn't have a job in 5 years.

Whether the use of AI tools in an assessment is appropriate will depend on the goals of that assessment. As ever, you should discuss this with your lecturers – there will certainly be assessments where the use of AI tools is encouraged, as well as others where it would interfere with your learning and place you at a disadvantage later. Our goal is to help you learn how to ethically and professionally use the tools available to you. To learn more about the use of AI, see this discussion we have written where we analyse the strengths and weaknesses of generative AI tools and discuss when it is professionally and ethically appropriate to use them.

While AI may might provide useful tools to help with some assessments, UNSW's policy is quite clear that taking the output of generative AI and submitting it as your own work will never be appropriate, just as paying someone else to complete an assessment for you is serious misconduct.

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 for information about key dates, access to services, and lots more information
- Engineering Student Life - Current Student Resources for information about everything from getting to campus to our first year guide
- Student Support and Success for our UNSW team dedicated to helping with university life, visas, wellbeing, and academic performance
- Academic Skills to brush up on some study skills, time management skills, get one-on-one support in developing good learning habits, or join workshops on skills development
- Student Wellbeing, Health and Safety for information on the UNSW health services, mental health support, and lots of other useful wellbeing resources
- Equitable Learning Services for assistance with long term conditions that impact on your studies
- IT Service Centre for everything to do with computing, including installing UNSW licensed software, access to computing systems, on-campus WIFI and off-campus VPNs

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. Most 6 UoC courses will involve approximately 10-12 hours per week of work on your part. If you're not sure what to do in these hours of independent study, the resources on the UNSW Academic Skills pages offer some suggestions including: making summaries of lectures, read/summarise sections from the textbook, attempt workshop problems, reattempting workshop problems with some hints from the solutions, looking for additional problems in the textbook.

Full-time enrolment at university means that it is a *full-time* occupation for you and so you would typically need to devote 35 hours per week to your studies to suceed. Full-time enrolment at university is definitely incompatible with full-time employment. Part-time/casual employment can certainly fit into your study schedule but you will have to carefully balance your study obligations with that work and decide how much time for leisure, family, and sleep you want left after fullfilling your commitments to study and work. Everyone only gets 168 hours per week; overloading yourself with both study commitments and work commitments leads to poor outcomes and dissatisfaction with both, overtiredness, mental health issues, and general poor quality of life.

On-campus class attendance

In 2023, most classes at UNSW are running in a face-to-face mode only. Attendance is expected as is

participation in the classes. As an evidence-driven engineer or scientist, you'll be interested to know that education research has shown students learn more effectively when they come to class, and less effectively from lecture catch-up recordings. If you have to miss a class due to illness, for example, we expect you to catch up in your time, and within the coming couple of days.

For most courses that are running in an "in person" mode:

- Lectures are normally recorded to provide an opportunity to review material after the lecture; lecture recordings are not a substitute for attending and engaging with the live class.
- Workshops/tutorials are not normally recorded as the activities that are run within those sessions normally cannot be captured by a recording. These activities may also include assessable activities in some or all weeks of the term.
- Laboratories are not recorded and require in-person attendance. Missing laboratory sessions may require you to do a make-up session later in the term; if you miss too many laboratory sessions, it may be necessary to seek a Permitted Withdrawal from the course and reattempt it next year, or end up with an Unsatisfactory Fail for the course.
- Assessments will often require in-person attendance in a timetabled class or a scheduled examination.

This course outline will have further details in the Course Schedule and Assessment sections.

Class numbers are capped in each class to ensure appropriate facilities are available, to maintain student:staff ratios, and to help maintain adequate ventilation in the spaces. Only students enrolled in each specific 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 classes.

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 have COVID-19 or have been advised to self-isolate by NSW health or government authorities.

Asking Questions

Asking questions is an important part of learning. Learning to ask good questions and building the confidence to do so in front of others is an important professional skill that you need to develop. The best place to ask questions is during the scheduled classes for this course, with the obvious exception being questions that are private in nature such as special consideration or equitable learning plans. Between classes, you might also think of questions — some of those you might save up for the next class (write them down!), and some of them you might ask in a Q&A channel on Teams or a Q&A forum on Moodle. Please understand that staff won't be able to answer questions on Teams/Moodle immediately but will endeavour to do so during their regular working hours (i.e. probably not at midnight!) and when they are next working on this particular course (i.e. it might be a day or two). Please respect that staff are juggling multiple work responsibilities (teaching more than one course, supervising research students, doing experiments, writing grants, …) and also need to have balance between work and the rest of their life.

Note: This course outline sets out description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle should be consulted for the up to date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline (as updated in Moodle), the description in the Course Outline/Moodle applies.

Image Credit

Pilot Hall with experiment rigs // UNSW Chemical Engineering

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	✓