

FOOD9103

Advanced Food Microbiology

Term 2, 2023



Course Overview

Staff Contact Details

Convenors

Name	Email	Availability	Location	Phone
Jian Zhao	jian.zhao@unsw.edu.au	By appointment	E8, room 421	Tel: 02938 64304; M: 0435980888

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

In this course you will elevate the study of food microbiology from its basic concepts to advanced consideration. The course will cover contemporary issues in microbial ecology of foods, food spoilage, foodborne microbial disease (including viruses), food and beverage fermentations, probiotic microorganisms, and the use of microorganisms as processing aids and sources of food ingredients and additives at an advanced level.

Using selected microbial groups and commodities, you will examine the biochemical, physiological and molecular mechanisms of microbial growth, survival and significance in food and beverage ecosystems as they evolve from raw material through processing to the consumer. These issues are directly related to the quality, safety, and production efficiency of food products. Through this course, you will gain an advantaged knowledge in these areas, and become more competent in managing microbiological issues in the food industry.

Course Aims

This course aims to impart contemporary knowledge of food microbiology to students at a specialist level. Students will gain specialised knowledge in crucial areas of food microbiology including microbial ecology of foods, food spoilage, foodborne microbial disease, food and beverage fermentations, probiotic microorganisms, and their impact on food quality, safety and production efficiency. The course further aims to develop student skills in self-learning, scientific communication, teamwork and leadership.

Course Learning Outcomes

1. Analyse the relationship between microorganisms and the production, quality and safety of foods and beverages at an advanced level
2. Evaluate the most recent advancement in key areas of food microbiology.
3. Employ skills in information processing, summarisation and presentation and apply the knowledge to solve practical issues in food microbiology.
4. Demonstrate a capacity for analytical and critical thinking, self-learning and working in a team environment.

This course is taught within the framework of Program 8033 Master by Coursework (Food Science and Technology). Students enrolled in this program is eligible to join Australian Institute of Food Science and Technology.

Teaching Strategies

Advanced Food Microbiology is a course designed to encourage, and provide opportunities for you to be an efficient self-learner. Most of the teaching and learning will be delivered online where reading materials in the form of original research articles, review articles and book chapters will be provided along with a study guide. The study guide will outline the study objectives, summarise key points of the reading materials and provide several review questions. Online learning will also include discussion forums and Q&A sessions for selected topics. Online learning will be supported by face-to-face lectures,

workshops, guest lectures and industry visits. At the start of the term, you will be assigned a major topic in food microbiology for study through the process of a ballot. Towards the end of the term, you will present its topic to the class in the form of a lecture/seminar as part of the teaching and learning strategies for the course.

As a major course within the broader discipline of food science and technology, it is necessary to provide the framework of knowledge that defines the boundaries of food microbiology. Lectures and reading materials serve this purpose, with assessment tasks designed to ensure grasp of the concepts, at both low level (through recall) and high level (through application and synthesis). As a course designed mainly for coursework masters programs, it is crucial to impart you with the capacity for self-learning so that you can become an efficient life-long learner. The online supported self-learning provides such opportunities for you to practice such skills. Literature review style assignments provide further opportunities for you to become proficient in information retrieval, processing and presentation. In keeping with the professional nature of food science programs, generic skills are emphasised, with group work activities in the form of journal club, seminar presentation and scientific writing forming core parts of the assessment.

Additional Course Information

This course is taught within the framework of Program 8033 Master by Coursework (Food Science and Technology). It is assumed that students will have an understanding of general microbiology and food microbiology, such as that gained through completion of courses MICR2201 and FOOD2320 or FOOD8320. Students who do not have a background in general microbiology and food microbiology are advised not to take this course.

This is a 6 UOC (units of credit) course, consisting of lectures, workshops, online learning sessions and industry visits. Students are expected to work a minimum of 6 hours on this course per week, including 3 hours of lectures, and 3 hours of guided self-learning.

The following students would find this course of most value: postgraduate students in the areas of food science and technology, microbiology, biotechnology, as well as professionals in the food or allied industries and government agencies, who are concerned with the microbiological quality and safety of foods, and fermented foods and beverages. Students in other areas of science may also find the course of interest. Food companies, consulting analytical laboratories and various government agencies at state, national and international levels employ food microbiologists. Food safety is a major concern to the food and beverage industries and food microbiology plays a key role, here.

Assessment

Assessment task	Weight	Due Date	Course Learning Outcomes Assessed
1. Journal Club	30%	Midnight, Sunday's, Weeks 3, 5, 7, 9 and 11	1, 2, 3, 4
2. Quizzes	30%	Week 4, Week 9	1, 2, 3, 4
3. Literature Review	20%	06/08/2023 11:59 PM	1, 2, 3, 4
4. Seminar Presentation	20%	Week 10	1, 2, 3, 4

Assessment 1: Journal Club

Due date: Midnight, Sunday's, Weeks 3, 5, 7, 9 and 11

Marks returned: 7 days after submission for each report.

Students are required to form a journal club at the start of the term. Each club is required to review five research articles published in the last 12 months and write a summary for each article. Work will be marked against assessment criteria. Individual written feedback will be provided online within 7 days for each report. Details of the assessment will be given on Moodle page in week 1.

This is not a Turnitin assignment

Assessment criteria

Detailed assessment criteria will be provided in week 1.

Additional details

Note: This assessment will consist of five tasks, each weighing equally (20%, or 6 marks for the overall course mark). There will also be team evaluations where the performance of each member in the journal club will be assessed individually by their peers.

Assessment 2: Quizzes

Assessment length: 1 hour

Due date: Week 4, Week 9

Marks returned: 7 days after each quiz.

There will be two quizzes, in weeks 4 and 9, each contributing 15% to the total course mark. The quizzes will consist of short answer questions that cover topics in the lectures and reading materials. Verbal feedback will be provided to class within 7 days after each quiz.

Assessment 3: Literature Review

Assessment length: 3,000 words (approximately)

Due date: 06/08/2023 11:59 PM

Marks returned: 10 days after submission

Students will write an approximately 3,000 word mini-review on outbreaks of foodborne microbial diseases in Australia and worldwide associated with particular foodstuff or pathogen specified during term. This task is designed to develop and assess student's knowledge of foodborne microbial diseases and their skills in information retrieval, processing, interpretation and summarisation. Work will be marked against assessment criteria. Individual written feedback will be provided online within 10 days. Details of the assessment will be given on Moodle page in week 1.

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

Assessment criteria

Detailed assessment criteria will be provided before week 5.

Assessment 4: Seminar Presentation

Due date: Week 10

Marks returned: 10 days after the seminar

You will be allocated a topic on food microbiology, and are required to study the topic and present a seminar to the class on that topic. The seminar presentation is expected to be about 10 minutes long, followed by up to 3 minutes of question time. The seminar presentation will be held in the normal lecture time in week 10. You can choose to make a face-to-face presentation in the lecture room, or post a video posted on Moodle or Teams. The seminar presentation will be assessed against assessment criteria. Written feedback will be provided online within 10 days. Details of the assessment will be given on Moodle page in week 1.

This is not a Turnitin assignment

Assessment criteria

Detailed assessment criteria will be provided before week 5.

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Schedule

[View class timetable](#)

Timetable

Date	Type	Content
Week 1: 29 May - 2 June	Lecture	Introduction to the course Review of general concepts in food microbiology
	Lecture	Molecular microbial ecology of foods Microbial spoilage of food – an in-depth examination of fish spoilage
Week 3: 12 June - 16 June	Workshop	How to write a good literature review and make a good seminar and poster presentation.
	Assessment	Journal Club
Week 4: 19 June - 23 June	Lecture	Foodborne microbial illnesses: an update on key pathogens (Salmonella)
	Assessment	Quizzes
Week 5: 26 June - 30 June	Lecture	Cocoa fermentation – an in-depth examination of a complex fermentation process
	Assessment	Journal Club
Week 6: 3 July - 7 July	Homework	No lecture this week. Students are encouraged to use the time to work on their assignments
Week 7: 10 July - 14 July	Lecture	Probiotics and prebiotics
	Assessment	Journal Club
Week 8: 17 July - 21 July	Lecture	Molecular methods for microbiological analysis of foods
Week 9: 24 July - 28 July	Lecture	Predictive microbiology and microbial food risk assessment
	Assessment	Journal Club
	Assessment	Quizzes
Week 10: 31 July - 4	Assessment	Literature Review

August	Assessment	Seminar Presentation
Stuvac: 7 August - 11 August	Assessment	Journal Club

Resources

Prescribed Resources

Reading materials for each week will be posted on the Course Moodle page at least 5 days before the lecture.

Recommended Resources

There is no single text book that covers all the materials given in this course. Course content will be taken from a range of review and research type articles in journals, book chapters and other documents. These articles will be posted, over the coming weeks of the semester, either in full text on the Moodle page for the course, or by providing their online links if copyright regulations do not permit direct upload of the full text. Some useful books in food microbiology, for which students should consult, are listed below.

- Food Microbiology - Fundamentals and Frontiers, M.P. Doyle, et al., 4th ed, American Society for Microbiology (ASM), 2013. Online version available at <http://app.knovel.com/hotlink/toc/id:kpFMFFE001/food-microbiology-fundamentals/food-microbiology-fundamentals>
- Molecular Techniques in the Microbial Ecology of Fermented Foods, L. Cocolin and D. Ercolini, ed. Springer-Verlag, New York, 2010.
- [Microorganisms in Foods, Volume 6, Microbial Ecology of Food Commodities, International Commission on Microbiological Specifications of Foods, 2nd ed, Springer, 2005.](#)
- Foodborne Pathogens: Hazards, Risk Analysis and Control, D. Blackburn and P. McClure., 2nd ed, Woodhead Publishers, Cambridge, 2009.
- Foodborne Microorganisms of Public Health Significance, A.D. Hocking et al., eds, 6th ed, AIFST Inc. (NSW Branch) Food Microbiology Group, Sydney, 2003.
- Yeasts in Food and Beverages, A. Querol and G.H. Fleet, Springer, Berlin, 2006.
- The Yeasts—A Taxonomic Study, CP Kurtzman, J.W. Fell and T. Boekhout, 5th ed, Elsevier, 2010.
- Fungi and Food Spoilage, J.I. Pitt and A. Hocking, 3rd ed, Springer, 2010.
- Microbiology and Technology of Fermented Foods, R.W. Hutkins, IFT Press, Blackwell Publishing, 2006.

Students are also strongly encouraged to consult key journals in the field such as

- International Journal of Food Microbiology
- Food Microbiology

Both journals can be accessed electronically through the UNSW Library

Course Evaluation and Development

It is very important to gather feedback on courses, so whenever practicable to do so, courses can be modified to improve them. To that end, there will be the normal on-line *Mysurvey* for this course, but also discussions of the course content and delivery with students throughout the semester.

Laboratory Workshop Information

There are no labs for this course. There will be a workshop on writing literature review and on seminar and poster presentations.

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
<ul style="list-style-type: none"> ✓ reading/searching through material we have given you, including lecture slides, course notes, sample problems, workshop problem solutions ✓ reading/searching lecture transcripts ✓ reading/searching resources that we have pointed you to as part of this course, including textbooks, journal articles, websites ✓ reading/searching through your own notes for this course ✓ all of the above, for any previous courses ✓ using spell checkers, grammar checkers etc to improve the quality of your writing ✓ studying course material with other students 	<ul style="list-style-type: none"> ✗ asking for help with an assessment from other students, friends, family ✗ asking for help on Q&A or homework help websites ✗ searching for answers to the specific assessment questions online or in shared documents ✗ copying material from any source into your answers ✗ using generative AI tools to complete or substantially complete an assessment for you ✗ paying someone else to do the assessment for you

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 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 succeed. 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 fulfilling 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.