

FOOD9103

Advanced Food Microbiology

Term 2, 2022



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

Enquiries related to the course (e.g. course content, assessment instructions) should be raised during the scheduled classes, office hours, or in Teams channels/Moodle forums designated for that purpose.

Learning and question etiquette:

- Please be prepared for classes and attend the timetabled classes so that you can ask questions during the class time.
- Please respect that demonstrators and tutors have scheduled the class time to help you learn and are likely to be busy with other responsibilities outside those times; questions asked outside of class times will take longer to be answered.
- PhD students and other casuals who are teaching classes are normally only expected to look after the timetabled class and not to provide follow-up one-on-one assistance.
- Please don't ask questions in private that could be reasonably asked in a way that everyone can learn from the discussion.
- As a member of a community of learners, please try answering each other's questions!
- Please limit private messages to staff (via email or Teams) to *confidential* matters related to course administration.

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](#).

Course Details

Units of Credit 6

Summary of the Course

This course takes food microbiology from its basic concepts to advanced consideration of current issues in microbial ecology of foods, food spoilage, foodborne microbial disease (including viruses), food and beverage fermentations and the use of microorganisms as processing aids and sources of food ingredients and additives. Using selected microbial groups and commodities, it examines the biochemical, physiological and molecular mechanisms of microbial growth, survival and significance in food and beverage ecosystems as they evolve from the raw material through processing to the consumer. Emphasis will be on the linkage between microbial activity, product quality and safety, and practical management of these needs. The course will be taught mainly online through the internet, augmented by occasional face-to-face lectures, workshops and industry visits.

Course Aims

- To provide a consideration of food microbiology at an advanced level
- To update the knowledge on current issues in food microbial ecology, foodborne microbial diseases and food and beverage fermentations
- To introduce current major topics and recent advances in food microbiology research
- To develop student skills in self-learning and scientific communication
- to enhance student ability to function efficiently in a team environment.

Course Learning Outcomes

1. Acquire a broad and in-depth knowledge and understanding of how microorganisms impact on the production, quality and safety of foods and beverages, and appreciate the social and commercial significance of food microbiology.
2. Become familiar with the most recent advancement in key areas of food microbiology
3. Develop a capacity for information processing, summarisation and presentation and application of the knowledge to solve practical issues in food microbiology
4. Have an enhanced capacity for analytical and critical thinking, self-learning and working in a team environment
5. Develop an enhanced respect for ethical practice and social responsibility

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, students to be efficient self-learners. 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 a number of 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, students will be

divided into groups, and each group will be assigned a major topic in food microbiology for study through the process of a ballot. Towards the end of the Term, each group will present its topic to the class in the form of a comprehensive 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 students the capacity for self-learning so that they can become an efficient life-long learner. The online supported self-learning provides such opportunities for students to practice such skills. Literature review style assignments provide further opportunities for students 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, group 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. Literature review	30%	07/08/2022 11:59 PM	1, 2, 3, 4, 5
2. Journal Club	40%	Midnight, Sunday, weeks 3, 5, 7, 9 and 11	1, 2, 3, 4, 5
3. Seminar and poster presentations	30%	Week 10	1, 2, 3, 4, 5

Assessment 1: Literature review

Assessment length: 3,000 words (approximately)

Due date: 07/08/2022 11:59 PM

Information retrieval, processing, interpretation and summarisation are a crucial set of skills for a food technology graduate. These skills are essential in the professional undertakings in the food industry. This assessment item is designed to develop as well as to assess student's ability in these skills. It forms an integral part of the learning strategies for this course. Students are required to write a mini-review on outbreaks of foodborne microbial diseases associated with fresh vegetables in Australia and worldwide.

Detailed information on the literature review will be provided in Moodle and Teams in week 1 of the Term.

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

Assessment criteria

Assessment criteria will be provided along with the assessment detail in week 1.

Assessment 2: Journal Club

Due date: Midnight, Sunday, weeks 3, 5, 7, 9 and 11

A journal club is a group of people who meet regularly to critically evaluate recent articles in the scientific literature, usually focusing on a particular scientific discipline, e.g., food microbiology. It is widely used in many professions for practitioners to keep up with recent advances in their field and renew their professional knowledge. It is also an excellent tool for students learning as it provides an opportunity for students to learn the newest knowledge in their discipline, critically evaluate scientific research, summarise research findings and foster group learning and team work skills. This assessment, along with assessment 1, is designed to further develop as well as assess student's self-learning skills. It forms an integral part of the learning strategies for this course.

This is not a Turnitin assignment

Assessment criteria

Assessment criteria will be provided along with the assessment detail in week 1.

Additional details

Note: This assessment will consist of five tasks, each weighing equally (20%, or 8 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. Details of the assessment will be given on Moodle page in week 1.

Assessment 3: Seminar and poster presentations

Due date: Week 10

As a food technology professional, you will frequently be required to make oral presentations to your management, colleagues and customers. Furthermore, you will be frequently required to present technical information in the form of a poster. Sound communication skills, including seminar and poster presentation skills, are an important part of the attributes for UNSW graduates. It also forms an integral part of the learning strategies for this course. In this assessment, you will be required to make a seminar and a poster presentation about a topic on food microbiology.

Detailed information on this assessment will be provided on the course Moodle page in week 1.

This is not a Turnitin assignment

Assessment criteria

Assessment criteria will be provided to the class before week 6.

Additional details

Depending on the number of enrollments in the course, live seminar presentations may be changed into pre-recorded video presentations.

Attendance Requirements

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

Course Schedule

[View class timetable](#)

Timetable

Date	Type	Content
O-Week: 23 May - 27 May		
Week 1: 30 May - 3 June	Lecture	Introduction to the course Review of general concepts in food microbiology
Week 2: 6 June - 10 June	Lecture	Molecular microbial ecology of foods Microbial spoilage of food – an in-depth examination of fish spoilage
Week 3: 13 June - 17 June	Workshop	How to write a good literature review and make a good seminar and poster presentation.
Week 4: 20 June - 24 June	Lecture	Foodborne microbial illnesses: an update on key pathogens (Salmonella)
Week 5: 27 June - 1 July	Lecture	Cocoa fermentation – an in-depth examination of a complex fermentation process
Week 6: 4 July - 8 July	Homework	No lecture this week. Students are encouraged to use the time to work on their assignments
Week 7: 11 July - 15 July	Lecture	Probiotics and prebiotics
Week 8: 18 July - 22 July	Lecture	Molecular methods for microbiological analysis of foods
Week 9: 25 July - 29 July	Lecture	Predictive microbiology and microbial food risk assessment
Week 10: 1 August - 5 August	Presentation	Student presentations
	Assessment	Seminar and poster presentations

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 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>

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

Dr Peter Wich

CRICOS

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Acknowledgement of Country

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