



CBMS215

Microbiology

S2 Day 2014

Chemistry and Biomolecular Sciences

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Disclaimer

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

General Information

Unit convenor and teaching staff

Unit Convenor

Maria Lategan

maria.lategan@mq.edu.au

Contact via maria.lategan@mq.edu.au

Credit points

3

Prerequisites

(BIOL115 and CBMS101 or HSC Chemistry Band 4) or admission to GCertBiotech

Corequisites

Co-badged status

Unit description

Microbiology is the study of microorganisms and underpins many other areas of contemporary sciences such as medicine and biotechnology. This unit introduces the role of microorganisms in natural environments and disease and the ways they have been employed for practical benefits across the life sciences and industry. Lecture topics include the history of microbiology, microbial cell structure and function, microbial genetics and biodiversity, microbial growth, and a variety of topics in applied environmental and industrial microbiology. The hands-on laboratory sessions provide the students with essential skills and techniques used in microbiology and demonstrate principles taught in the lectures. This unit will be excellent for students majoring in biomolecular sciences, biology, environmental sciences and medical sciences.

Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

Learning Outcomes

On successful completion of this unit, you will be able to:

Describe of the microbial world and its diversity, requirements for life, reproduction, processes, adaptations, interactions and applications.

Design and conduct a microbiology scientific experiment.

Source microbiology literature to support scientific reports.

Communicate scientific information relevant to microbiology.

Understand the importance of bacteriological media and its application.

Interpret laboratory microscopy and cultures from various environments.

Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Assessment Tasks

Name	Weighting	Due
<u>Assignment 1-Scientific report</u>	5%	9-11/9/14
<u>Mid-semester test</u>	10%	15/9/14
<u>Assignment 2</u>	10%	23-25/9/14
<u>Assignment 3</u>	20%	4-6/11/14
<u>Final Examination</u>	45%	University Examination Period
<u>Continuous assessment</u>	10%	TBA

Assignment 1-Scientific report

Due: **9-11/9/14**

Weighting: **5%**

A concise 2 page scientific report is required. *Please note the page limit. Penalties of 2 mark deduction per extra page will apply.*

On successful completion you will be able to:

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- Communicate scientific information relevant to microbiology.
- Understand the importance of bacteriological media and its application.
- Interpret laboratory microscopy and cultures from various environments.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Mid-semester test

Due: **15/9/14**

Weighting: **10%**

The test will consist of multiple choice questions, short answers. The test will cover materials from lectures, tutorials and theory of practical.

On successful completion you will be able to:

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- Understand the importance of bacteriological media and its application.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial,aquatic systems and in food.

Assignment 2

Due: **23-25/9/14**

Weighting: **10%**

Submit a 3-page individual scientific report on the results of the experimental work. *Penalties will apply for abstracts over 100 words (1 marks deduction per word over the limit) and reports over 3 pages long (2 marks per page deduction over the limit).*

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Assignment 3

Due: **4-6/11/14**

Weighting: **20%**

This exercise is an introduction to conducting and managing a research project. Students to work in groups if possible. Students allocate team members to a group. Intervention by the convenor

may be necessary if group members are not suited for maintaining dynamics that lead to the successful completion of the research project. This assignment is designed to allow you to develop and achieve the learning outcomes, graduate attributes and capabilities outlined in this unit guide. Thus groups are empowered to own the research work and therefore are responsible and accountable for the design, performance and achievements as a result of the research work. Each member of the group will receive the group mark except for the last assessable component of the project – the abstract.

Every week the group is to work together on the investigation, discuss, reflect and present, therefore progress through the assignment as a cooperative unit. A folder will be provided so that your project design, plan, results and outcomes are recorded. The majority of work required for the assignment is undertaken during class time over a period of 5 weeks. During the course of the assignment each group is required to provide 2 progress Seminars (1-2 power point slides, 2-3 minutes). A final seminar (5 minutes) by each group will summarise their research findings and conclusions.

In addition, each student is also to prepare, individually, a 200 - word limit abstract detailing their findings. *Penalties will apply (0.5 marks per word over the limit).*

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- Communicate scientific information relevant to microbiology.
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Final Examination

Due: **University Examination Period**

Weighting: **45%**

The final exam will require for students to apply terminology and concepts learnt in the lecture and practical components to answer a variety of questions of a critical thinking nature. The exam will consist of multiple-choice questions, short and long answer questions. You will need to take a calculator into the examination. Only nonprogrammable calculators may be taken into the examination (3 hours plus 10 minutes reading time).

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Continuous assessment

Due: **TBA**

Weighting: **10%**

A number of short quizzes and/or tutorial questions will be placed online for students to download, complete and submit them as part of a continuous assessment program introduced into the unit in this offering. These are designed to provide students with an opportunity to reflect on the gained knowledge and to allow students to apply such knowledge in answering questions that require critical thinking.

On successful completion you will be able to:

- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Delivery and Resources

Classes

Lectures will be held on:

Wednesday	1-2 pm in W5C 220
Friday	1-2 pm in C5C collaborative Forum

Tutorials will be held on: Monday 1 - 2 pm in E6A 102 for weeks 32-37 and on Friday workshops in E8A 150 for weeks 40-44.

Lectures begin on the 29th August 2013. Lecture graphics will be available in ilearn on the day before each lecture.

Microbiology Web Site: <https://learn.mq.edu.au/>

Laboratory classes

Tuesday	2-6 pm	E8A 150
Wednesday	9-1 pm	E8A 150
Wednesday	2-6 pm	E8A 150

Students will need to register for one of the classes only.

Practicals start the first week of the semester (29th July 2013). **Please note that practical classes are a compulsory component for this course with medical certificates being required should a student be absent due to illness.** These should be submitted together with a special consideration request which can be found at: www.mq.edu.au/policy/docs/special_consideration/policy.html and handed in to the Science Centre E7A as soon as possible.

Required and Recommended Texts and/or Materials

Recommended text:

Prescott, Harley, Klein, Microbiology, latest Edition. Author: Willey, McGraw-Hill, Boston, 2011 ISBN 0-07-255678-1

Brock Biology of Microorganisms 12th edition. M.T. Madigan, J. M. Martenko, P.V. Dunlap and D. P. Clark. Publisher: Pearson education Inc, San Francisco. ISBN:978-0321-53615-0

Required:

CBMS215 Microbiology Practical Manual - each laboratory session will be available on iLearn for download one week before the laboratory session.

Technology Used and Required

You are expected to access the unit web site on a frequent basis and download PDF files provided. Please note information may also be sent by email to your student email account so please look at your email account on a frequent basis.

Unit Web Page

The URL of the CBMS215 Microbiology iLearn site is: <http://learn.mq.edu.au/>

You will be asked for a username and password. Your username is your student MQID. Your MQID and password have been mailed to you by the University. If you have lost them go to the student portal: <http://my.mq.edu.au>.

You are expected to access the unit web site very frequently. This site contains important information including notes on ALL the topics to be covered.

Teaching and Learning Strategy

CBMS215 is a 3-credit point, half year unit and will require an average of 9 hours of

work per week (contact hours plus self study time).

The unit expectation is that you will:

- Read the recommended material and prepare for the laboratory classes
- Attend all sessions, with laboratory classes being compulsory
- Demonstrate reasonable competence in the assignments and tutorials
- Perform satisfactorily in both the practical component and the final exam

If you prepare and attend all components of the unit and work consistently and continuously throughout the semester, you should be able to develop a strong understanding of the subject whilst developing the general skills in microbiology and perform satisfactorily in this unit.

Laboratory classes are designed to develop basic laboratory skills, general safety practices and critical and analytical thought. In-lab and post-lab work are designed to allow you to appropriately record your experimental observations in a detailed and accurate manner and assess your understanding of the theory behind the experiments conducted and to use this understanding to solve related problems.

Assessment in this Unit

For passing this Unit, the Theory (45%) and Practical (55%) component **MUST** be completed satisfactorily. The final mark for the Practical component (out of 55) will consist of the marks obtained from three assignments and the mid semester test.

Unit Schedule

Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy http://mq.edu.au/policy/docs/academic_honesty/policy.html

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/policy.html

Disruption to Studies Policy http://www.mq.edu.au/policy/docs/disruption_studies/policy.html *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: https://students.mq.edu.au/support/student_conduct/

Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

Learning Skills

Learning Skills (mq.edu.au/learningskills) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

Student Enquiries

For all student enquiries, visit Student Connect at ask.mq.edu.au

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use Policy](#). The policy applies to all who connect to the MQ network including students.

Graduate Capabilities

Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to

demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

- Design and conduct a microbiology scientific experiment.
- Source microbiology literature to support scientific reports.
- Communicate scientific information relevant to microbiology.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Assessment tasks

- Assignment 1-Scientific report
- Assignment 2
- Assignment 3

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcome

- Describe of the microbial world and its diversity, requirements for life, reproduction, processes, adaptations, interactions and applications.

Assessment task

- Continuous assessment

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary

solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Describe of the microbial world and its diversity, requirements for life, reproduction, processes, adaptations, interactions and applications.
- Design and conduct a microbiology scientific experiment.
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Assessment tasks

- Assignment 1-Scientific report
- Mid-semester test
- Assignment 2
- Assignment 3
- Final Examination
- Continuous assessment

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

- Design and conduct a microbiology scientific experiment.
- Source microbiology literature to support scientific reports.
- Communicate scientific information relevant to microbiology.
- Interpret laboratory microscopy and cultures from various environments.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial,aquatic systems and in food.

Assessment tasks

- Assignment 1-Scientific report
- Mid-semester test
- Assignment 2
- Assignment 3
- Final Examination
- Continuous assessment

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

Learning outcomes

- Design and conduct a microbiology scientific experiment.
- Source microbiology literature to support scientific reports.
- Communicate scientific information relevant to microbiology.
- Interpret laboratory microscopy and cultures from various environments.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Assessment tasks

- Assignment 1-Scientific report
- Assignment 2
- Assignment 3
- Final Examination
- Continuous assessment

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcomes

- Design and conduct a microbiology scientific experiment.
- Source microbiology literature to support scientific reports.
- Communicate scientific information relevant to microbiology.
- Interpret laboratory microscopy and cultures from various environments.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Assessment tasks

- Assignment 1-Scientific report
- Assignment 3

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

Learning outcomes

- Describe of the microbial world and its diversity, requirements for life, reproduction, processes, adaptations, interactions and applications.
- Design and conduct a microbiology scientific experiment.
- Source microbiology literature to support scientific reports.
- Communicate scientific information relevant to microbiology.

Assessment tasks

- Assignment 1-Scientific report
- Mid-semester test
- Assignment 2
- Assignment 3
- Final Examination

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with

knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcomes

- Design and conduct a microbiology scientific experiment.
- Communicate scientific information relevant to microbiology.
- Interpret laboratory microscopy and cultures from various environments.

Assessment tasks

- Assignment 1-Scientific report
- Assignment 2
- Assignment 3

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcomes

- Design and conduct a microbiology scientific experiment.
- Communicate scientific information relevant to microbiology.
- Apply fundamental concepts and developed knowledge in microbiology to discuss aspects of medicine, industry, in biogeochemical cycling, in terrestrial, aquatic systems and in food.

Assessment tasks

- Assignment 1-Scientific report
- Assignment 2
- Assignment 3

Feedback

We are always open to suggestions for improving the content and delivery of the unit. We are very grateful to past students who have provided feedback and comments on what they would like to see in this unit in order to improve learning experiences. The improvements as a result of their comments have benefited many students. Please provide any feedback to Dr. Josie

Lategan or Mrs E Mardones.

Special consideration requests including non-attendance and extensions

The University is committed to equity and fairness in all aspects of its learning and teaching. In stating this commitment, the University recognises that there may be circumstances where a student is prevented by unavoidable disruption from performing in accordance with their ability. The University has a policy on special consideration request that may be found at www.mq.edu.au/policy/docs/special_consideration/policy.html. The University recognises that at times an event or set of circumstances may occur that:

- could not have reasonably been anticipated, avoided or guarded against by the student AND
- was beyond the student's control AND
- caused substantial disruption to the student's capacity for effective study and/or completion of required work AND
- substantially interfered with the otherwise satisfactory fulfillment of a unit or program requirements AND
- was of at least three (3) consecutive days duration within a study period and/or prevented completion of a formal examination.

This policy is instituted to support students who experience serious and unavoidable disruption such that they do not reach their usual demonstrated performance level. The form required to submit for a request for special consideration can be found at www.registrar.mq.edu.au/Forms/APScons.pdf. This form should be submitted as soon as possible to allow due consideration.

Non-Attendance: Students unable to attend a laboratory session, assessment task or the final exam due to illness or other extenuating circumstances must fill in a special consideration form and provide formal documentary evidence to the Science Centre E7A as soon as possible.

Students MUST contact Dr. Josie Lategan immediately to make alternative arrangements if a laboratory session or an assessment task has been missed. Contact can be by email or phone. The intensive nature of laboratory sessions and assessments over a period of weeks means that non-attendance can significantly impact on your progress. Please be aware that should you miss an assessment task for whatever reason and you do not contact the convenor, an alternative assessment might be available. However please note that this will be at the discretion of the convenor. Should the convenor decide to provide an alternative assessment, please note that a 24 hour notification email (any day) of a date to attend the alternative assessment/supplementary exam will be issued. If students do not

attend the designated alternative assessment, no further alternative assessments will be available.

Extensions and penalties

10% of the mark allocated for the assignment will be deducted per day for any work submitted late.

The deadlines for assignments are not negotiable. Only medical certificates and/or other appropriate supporting documents outlining other serious, extenuating circumstances will be considered when submitting an assignment after the due date.. All applications for special consideration or extension must be sought before the due date unless this is absolutely impossible.

All applications for extensions of deadlines must be submitted to the subject convenor.

Changes since First Published

Date	Description
15/01/2014	The Prerequisites was updated.