313400 Biomedical Science 100
Semester 1, 2012

Unit study package number: 313400
Mode of study: Internal
Tuition pattern summary: Lecture: 1 x 2 Hours
Laboratory: 1 x 2 Hours
This unit does not have a fieldwork component.
Credit Value: 25.0
Pre-requisite units: Nil
Co-requisite units: Nil
Anti-requisite units: Nil
Result type: Grade/Mark
Approved incidental fees: Information about approved incidental fees can be obtained from our website. Visit fees.curtin.edu.au/incidental_fees.cfm for details.

Unit coordinator:
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Building: 308
Room: 203
Consultation times: See Adrian during labs or email to arrange a consultation.

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Room: 213

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Learning Management System: Blackboard (lms.curtin.edu.au)
Acknowledgement of Country
We respectfully acknowledge the Indigenous Elders, custodians, their descendants and kin of this land past and present.

Syllabus
This unit is an introduction to the theory and application of disciplines in the biomedical sciences: microbiology, immunology, histopathology, haematology, biochemistry and molecular genetics. Themes include the basic theory of the cellular and molecular components that form the foundations of biomedical science, the investigation of disease and infectious agents, occupational health considerations, the use of specialized equipment and testing of biological samples in a professional manner. The role and function of medical and research laboratories will also be explored.

Introduction
Welcome to Biomedical Science 100! The area of biomedical science is an exciting and fascinating field for anyone interested in science, medicine or laboratory work. This unit will introduce you to biomedical science including the theory, the significance and the application of activities performed in diagnostic or medical research laboratories. You will be provided with the opportunity to develop Curtin graduate attributes both as an independent learner and as part of a team with other students and the University staff involved in Biomedical Science 100. You will be strongly encouraged to “think” and “act” like a professional Biomedical Scientist throughout this unit. Students taking this unit include those studying courses in Laboratory Medicine/Medical Science, Human Biology Preclinical, Oral Health Therapy and Molecular Genetics & Biotechnology however the material is applicable to any Health Science or Biology degree.

Learning Outcomes
On successful completion of this unit students can:

<table>
<thead>
<tr>
<th>Graduate Attributes addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Categorize and explain characteristics of microorganisms and relate their interactions with humans and the environment</td>
</tr>
<tr>
<td>2 Describe and explain the basic components and function of the human immune system, blood and selected tissues</td>
</tr>
<tr>
<td>3 Propose and evaluate measures for the prevention of the spread of pathogens in laboratory and clinical settings</td>
</tr>
<tr>
<td>4 Perform selected laboratory techniques competently and safely</td>
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</table>

Curtin’s Graduate Attributes

| Thinking skills (use analytical skills to solve problems) |
| Technology skills (confidence to tackle unfamiliar problems) |
| Information skills (confidence to investigate new ideas) |
| Learning how to learn (apply principles learnt to new situations) |
| Professional Skills (work independently and as a team) |

Find out more about Curtin’s Graduate attributes at the Office of Teaching & Learning website: otl.curtin.edu.au

Learning Activities
Learning outcomes will be achieved through an integrated program of lectures and laboratory sessions. Lectures will provide core content in this unit and will be complemented by Powerpoint slides on Blackboard and will also be available as iLectures to give additional access for revision or if a session is missed. Laboratory sessions will comprise a series of experiments and exercises in appropriate biomedical laboratory facilities particularly relevant to the discipline being considered. The practical exercises will illustrate concepts discussed in lectures and give students an opportunity to gain hands-on practical skills in important aspects of laboratory medicine.
Learning Resources

Recommended Texts

You do not have to purchase the following textbooks but you may like to refer to them.

- This unit does not have an essential textbook. A single text covering all discipline areas in this unit is not available at this point. Before purchasing textbooks for this unit it is advised that students attend the unit orientation session in Orientation Week. During this session students will be given an indication of the merits of the texts listed below and the suitability of these texts for the requirements of different students. Students will need to refer to a text that provides an introduction to microbiology. Three textbooks that can provide this information are listed below. It is also advisable that students refer to a text for an introduction to the remainder of the laboratory component (other than microbiology). Helpful texts for other aspects of this unit are also listed below.

- Engelkirk, P.G. & Burton, G. R. W. (2007 or 2011) Burton’s Microbiology, 8th or 9th Edition, Lippincott Williams & Wilkins PA. A relatively simple introduction to the area of microbiology. This text is recommended for Oral Health Therapy students, Human Biology Preclinical students, Nutrition students and Science & Engineering students that are not planning to undertake specialised microbiology units later in their course.


- Bauman, R.W. (2007) Microbiology with Diseases by Taxonomy, 3rd Ed Benjamin Cummings NY. A detailed, medical based, microbiology text that may be recommended for subsequent units taken by Laboratory Medicine students.

- Cox, P. & Wilken, D. (2011) Palko’s Medical Laboratory Procedures, 3rd Ed. McGraw Hill NY. This text is recommended for an introduction to the remainder of the laboratory component of the unit (other than microbiology).

- Reed, R., Holmes, D., Weyers, J. & Jones, A. (2007) Practical Skills in Biomolecular Sciences, 3rd Ed, Pearson Benjamin Cummings UK. This text is suggested as a general laboratory guide for laboratory aspects of this unit and subsequent years of laboratory based courses.

Other Resources

Online resources: Lecture slides on Blackboard, iLectures.

Assessment

Assessment Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Value %</th>
<th>Date Due</th>
<th>Unit Learning Outcome(s) Assessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory test</td>
<td>15 percent</td>
<td>Week: 4</td>
<td>1,3</td>
</tr>
<tr>
<td>Lab test</td>
<td>20 percent</td>
<td>Week: 6</td>
<td>1,3,4</td>
</tr>
<tr>
<td>Final lab test</td>
<td>20 percent</td>
<td>Week: 13</td>
<td>1,3,4</td>
</tr>
<tr>
<td>Final theory examination</td>
<td>45 percent</td>
<td>Week: Semester Examination Period</td>
<td>1,2,3,4</td>
</tr>
</tbody>
</table>
Detailed information on assessment tasks

1. Your first assessment will cover the first 3 weeks of this unit. It will be run through the “Assessment Centre” located in the Library (105:510) and will run in week 4 or week 5, depending on the availability of the Assessment Centre. It will consist of multi-choice questions and be worth 15% of your final assessment. When you go to do the test please bring your ID card. You will have 40 minutes to complete the test. This is a closed book assessment. You must reserve a time during week 4 or 5 to sit the test.

Please be advised the Assessment Centre booking system gives students the flexibility to book a test at a time that is suitable. This does not guarantee that your preferred time will be available. It is your responsibility to ensure that you have completed the test within the specified availability period. Students are advised to make their bookings early in the semester for their eTest.

To make your bookings click on the link in the My Studies tab in OASIS. Once you have made your booking be sure to record the date and time in your diary. We encourage students to be early, however if you arrive more than 10 minutes before your scheduled time you may be asked to wait.

Bookings can be changed or deleted up to 10 minutes before the start time. If you do not plan to use your bookings please delete the booking so that it can be made available to another student. If you arrive more than 10 minutes after your scheduled booking you will forfeit your booking. If you do not attend at the scheduled time your booking will be blocked. In either case you will not be able to make another booking until the block has been removed by the Assessment Centre Team.

The Assessment Centre is open from 8:00 am to 6:00 pm (last test time 5:00 pm) Monday to Friday.

2. The second assessment will be laboratory based and done in your Laboratory session 5. It will be microbiology focused and consists of performing a gram stain of bacteria, viewing the gram stain using a microscope that you set up appropriately, reporting on that gram stain, plating out for single colonies and performing an aseptic dilution test. These manipulations will be taught in the first 4 laboratory sessions of this unit. This laboratory test will form 20% of your final assessment.

3. The third assessment is also a laboratory-based assessment and will cover the laboratory work done throughout the semester, with particular focus on laboratory sessions 6 to 10. This will include methods based on the immunology, haematology, histopathology, biochemistry and molecular biology components of this unit. The format of this assessment is not the same as the first lab test. The Final Lab Test will assess the information from the laboratory sessions but it is a “dry” theoretical test, not a “wet” or “hands on” test. Students are encouraged to keep an up-to-date Laboratory Manual during the semester that includes experimental observations, relevant information gained and the conclusions developed from each laboratory session. Students will be permitted to bring their Laboratory Manual into the test and it is expected that a fully completed Laboratory Manual will be of assistance during the Final Lab Test. Students will be expected to show their deep understanding of concepts covered in the unit and to bring together information about the various disciplines covered. This will form 20% of your final assessment.

4. The final assessment task will be the final theoretical exam done during the examination period at the end of semester. It will cover all work done in the semester in the unit. It will be a 2 hour written exam and consist of multi-choice and short answer questions. This will be worth 45% of your final assessment.

Fair assessment through moderation

Moderation describes a quality assurance process to ensure that assessments are appropriate to the learning outcomes, and that student work is evaluated consistently by assessors. Minimum standards for the moderation of assessment are described in the Assessment Manual, available from policies.curtin.edu.au/policies/teachingandlearning.cfm
Late penalties

Late Assessment Policy

This ensures that the requirements for submission of assignments and other work to be assessed are fair, transparent, equitable, and that penalties are consistently applied.

1. All assessments which students are required to submit will have a due date and time specified on the Unit Outline.
2. Accepting late submission of assignments or other work will be determined by the unit coordinator or Head of School and will be specified on the Unit Outline.
3. If late submission of assignments or other work is not accepted, students will receive a penalty of 100% after the due date and time ie a zero mark for the late assessment.
4. If late submission of assignments or other work is accepted, students will be penalised by ten percent per calendar day for a late assessment submission (eg a mark equivalent to 10% of the total allocated for the assessment will be deducted from the marked value for every day that the assessment is late). This means that an assignment worth 20 will have two marks deducted per calendar day late. Hence if it was handed in three calendar days late and marked as 12/20, the student would receive 6/20. An assessment more than seven calendar days overdue will not be marked. Work submitted after this time (due date plus seven days) may result in a Fail - Incomplete (F-IN) grade being awarded for the unit.

Pass requirements

Students are expected to complete all pieces of assessment. Students must achieve an overall grade of 50% to pass the unit.

Students are required to attend a minimum of 75% of the tutorials/laboratories in order to be eligible to pass the unit. Where there are extenuating circumstances students must provide supporting evidence for their absence. For example:

- Compassionate grounds (certificate from an appropriate Curtin counsellor, minister of religion, medical practitioner or other appropriately qualified person).
- Medical grounds (certificate from a medical practitioner).
- Psychological grounds (certificate from a registered psychologist/psychiatrist).
- Other grounds of significance not listed

Students should note that a mark of 50% or more in BOTH the theoretical AND practical component of the unit is required in order to secure a pass. Failure in any one area may result in an overall failure in this unit regardless of the total marks accrued. That is, a pass in the practical component but failure in the theory (or vice versa) may lead to a fail grade for the unit, even though the student's total mark may exceed 50%.

Referencing style

Students should use the Chicago referencing style when preparing assignments.

More information can be found on this style from the Library web site: library.curtin.edu.au

Plagiarism

Plagiarism occurs when work or property of another person is presented as one's own, without appropriate acknowledgement or referencing. Plagiarism is a serious offence. For more information refer to academicintegrity.curtin.edu.au

Plagiarism Monitoring

Work submitted may be subjected to a plagiarism detection process, which may include the use of systems such as ‘Turnitin’. For further information, see academicintegrity.curtin.edu.au/students/turnitin.cfm.
Additional information

Enrolment:
It is your responsibility to ensure that your enrolment is correct - you can check your enrolment through the eStudent option on OASIS, where you can also print an Enrolment Advice.

Supplementary/Deferred Exams:
Supplementary and deferred examinations may be granted by the Board of Examiners. Notification to students will be made after the appropriate Board of Examiners meeting and via the Official Communications Channel (OCC) in OASIS. It is the student’s responsibility to check their OASIS account for official Curtin correspondence on a weekly basis. If your results show that you have been awarded a supplementary or deferred exam you should immediately check your OASIS email for details.

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Supplementary/Deferred Exams:
Supplementary and deferred examinations will be held at a date to be advised. Notification to students will be made after the Board of Examiners meeting via the Official Communications Channel (OCC) in OASIS. It is the student's responsibility to check their OASIS account on a weekly basis for official Curtin correspondence. If your results show that you have been awarded a supplementary or deferred exam you should immediately check your OASIS email for details.

Student Rights and Responsibilities
It is the responsibility of every student to be aware of all relevant legislation, policies and procedures relating to their rights and responsibilities as a student. These include:

- the Student Charter
- the University's Guiding Ethical Principles
- the University's policy and statements on plagiarism and academic integrity
- copyright principles and responsibilities
- the University's policies on appropriate use of software and computer facilities

Information on all these things is available through the University's "Student Rights and Responsibilities website at: [students.curtin.edu.au/rights](http://students.curtin.edu.au/rights).

Disability
Students with a disability or medical condition (e.g. mental health condition, chronic illness, physical or sensory disability, learning disability) are encouraged to seek advice from Disability Services [www.disability.curtin.edu.au](http://www.disability.curtin.edu.au). A Disability Advisor will work with you and liaise with staff to identify strategies to assist you to meet unit (including fieldwork education) and course requirements, where possible. It is important to note that the staff of the university may not be able to meet your needs if they are not informed of your individual circumstances.

Recent unit changes
We welcome feedback as one way to keep improving this unit. Students are encouraged to provide unit feedback through eVALUate, Curtin's online student feedback system (see [evaluate.curtin.edu.au/info](http://evaluate.curtin.edu.au/info)). Recent changes to this unit include:

Modification of Laboratory Test assessment procedures.  Review of Final Exam format.

See [evaluate.curtin.edu.au](http://evaluate.curtin.edu.au) to find out when you can eVALUate this unit.
<table>
<thead>
<tr>
<th>Week Number</th>
<th>Begin Date</th>
<th>Lecture</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Wednesday 4:00 pm - 6:00 pm (405.201)</td>
<td>either Monday (308.261) or Tuesday (308.250) or Thursday (308.261)</td>
</tr>
</tbody>
</table>

### Orientation Week

**20th Feb**

**Biomedical Science 100 Unit Orientation**
- Oral Health Students Only - Tuesday 3:00pm in 105.331
- All Other BMS100 Students –Thursday 11:30am in 403.101

<table>
<thead>
<tr>
<th>Week Number</th>
<th>Begin Date</th>
<th>Lecture</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27th Feb</td>
<td>Introduction to the Biomedical Sciences: role of the laboratory in diagnostic pathology. Basic requirements for Laboratory Safety. (AP / BB)</td>
<td>No Practical</td>
</tr>
<tr>
<td>2</td>
<td>5th Mar</td>
<td>Concepts of microbiology: types of microorganisms, their role in health and infectious disease. Fundamentals of bacteriology. (BB)</td>
<td>Practical 1 Lab Orientation, Safety &amp; Techniques</td>
</tr>
<tr>
<td>3</td>
<td>12th Mar</td>
<td>An introduction to mycology, virology and parasitology. (BB)</td>
<td>Practical 2 Microscopy &amp; Staining</td>
</tr>
<tr>
<td>4</td>
<td>19th Mar</td>
<td>Control of microorganisms: the role of disinfection, sterilisation and antimicrobial chemotherapy. Asepsis and safe handling of microbes. (BB)</td>
<td>Practical 3 Microbial Ubiquity &amp; Cultivation</td>
</tr>
<tr>
<td>5</td>
<td>26th Mar</td>
<td>Applied bioscience: microbiology of foods. Microbes and the environment. Microbial biotechnology (BB)</td>
<td>Practical 4 Bacterial Classification &amp; Identification</td>
</tr>
<tr>
<td>7</td>
<td>9th Apr</td>
<td>Tuition Free Week</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>16th Apr</td>
<td>The blood and its components - an introduction to laboratory haematology. (AP)</td>
<td>Practical 6 Immunology</td>
</tr>
<tr>
<td>9</td>
<td>23rd Apr</td>
<td>Wednesday 25th Apr = Public Holiday</td>
<td>Practical 7 Haematology</td>
</tr>
<tr>
<td>10</td>
<td>30th Apr</td>
<td>Foundations of Histopathology - the study of human tissues, laboratory processing and section preparation. Basic histology. (VW)</td>
<td>Practical 8 Histopathology</td>
</tr>
<tr>
<td>11</td>
<td>7th May</td>
<td>Bio-molecules – review of the basic structure and function. (AP)</td>
<td>Practical 9 Clinical Biochemistry</td>
</tr>
<tr>
<td>Week</td>
<td>Date</td>
<td>Topic</td>
<td>Practical Assessment</td>
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<tr>
<td>12</td>
<td>14th May</td>
<td>Fundamentals of molecular biology and molecular genetics. Laboratory molecular diagnostic methods. (AP)</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>21st May</td>
<td>Instrumentation – introduction to the use of laboratory instruments and their quality assessment. (AP)</td>
<td>Practical Assessment</td>
</tr>
<tr>
<td>14</td>
<td>28th May</td>
<td>Study Week</td>
<td></td>
</tr>
<tr>
<td>15 + 16</td>
<td>4th Jun</td>
<td>Examinations</td>
<td></td>
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