Unit Outline 2014
Faculty of Education, Science, Technology and Mathematics

Human Biochemistry (UG)
6518
This Unit Outline must be read in conjunction with:

a) *UC Student Guide to Policies*, which sets out University-wide policies and procedures, including information on matters such as plagiarism, grade descriptors, moderation, feedback and deferred exams, and is available at *(scroll to bottom of page)*

b) *UC Guide to Student Services*, and is available at *(scroll to bottom of page)*

c) Any additional information specified in section 6h.

### 1: General Information

<p>| | |</p>
<table>
<thead>
<tr>
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</table>
| **1a** | **Unit title**  
Human Biochemistry (UG) |
| **1b** | **Unit number**  
6518 |
| **1c** | **Teaching Period and year offered**  
Semester 2, 2014 |
| **1d** | **Credit point value**  
3 |
| **1e** | **Unit level**  
2 |
| **1f** | **Name of Unit Convener and contact details (including telephone and email)**  
Dr Katie Cohen  
Room: 3A36  
Email: katie.cohen@canberra.edu.au |
| **1g** | **Name of Unit Moderator**  
Dr Naroa Etxebarria |
| **1h** | **Administrative contact details (including name, location, telephone and email)**  
Academic Programs Office 6C38  
[ESTeM-courseadvice@canberra.edu.au](mailto:ESTeM-courseadvice@canberra.edu.au)  
6201 2400 |
2: Academic Content

2a Unit description and learning outcomes
This unit provides a comprehensive look at cellular metabolism. It examines the synthesis and breakdown of biochemical molecules as fuels and building blocks for the human body to function while emphasizing recurring themes in biochemical mechanisms and regulation.

Learning Outcomes (LO)

On successful completion of this unit, students will:

1. Be able to describe the role of energy in living cells, with particular reference to the concept of free energy and the role of ATP;
2. Be able to describe the major biochemical pathways used in humans, both to extract energy from the key nutrients and to synthesise new cellular components;
3. Understand the mechanisms of metabolic control and be able to integrate their knowledge from both biochemistry units to understand its role in homeostasis, and;
4. Continue to develop the necessary skills for independent learning and use their biochemistry knowledge for solving simple biomedical problems.

2b Generic skills
The University recognises that individuals entering its programs bring with them a diversity of personal and professional attributes that should be further developed by their experience as students and graduates of the University. These generic skills can be accessed at: https://guard.canberra.edu.au/policy/policy.php?pol_id=3030

By the end of their course, graduates will have developed skills and attributes in:

1. Communication
The ability to present knowledge, ideas and opinions effectively and communicate within and across professional and cultural boundaries

2. Analysis and inquiry
The ability to gather information, and to analyse and evaluate information and situations in a systematic, creative and insightful way

3. Problem solving
The ability to apply problem-solving processes in novel situations; to identify and analyse problems then formulate and implement solutions

4. Working independently and with others
The ability to plan their own work, be self-directed, and use interpersonal skills and attitudes to work collaboratively

5. Professionalism and social responsibility
The capacity and intention to use professional knowledge and skills ethically and responsibly, for the benefit of others and the environment

Personal attributes
As students of the University they will develop the qualities of critical thinking, curiosity and reflective practice. They will use foresight, initiative and leadership, and be open to alternative
perspectives. As graduates, they will continue to learn and thrive in environments of complexity, ambiguity and change.

Generic skills that are emphasised in this unit are referred to in the assessment overview (5a).

2c Prerequisites and/or co-requisites
Both Chemistry 1B (1517) AND Biochemistry (6530) are prerequisites.

2d Accreditation
N/A.

3: Delivery of Unit and Timetable

3a Delivery mode
Delivery of subjects will be in traditional mode, on campus in standard semesters with two hours of lectures per week and three hours of practical/two hours of tutorial per week. Lectures and practical/tutorial classes are scheduled as follows:

Lectures: Wednesday 9.30-10.30am Room 14B1
          Thursday 8:30-9:30am Room 12B50

Practical/Tutorials:

TWO lab sessions per week have been scheduled; each student is to attend ONE of these sessions. You MUST choose one of the sessions and attend your allocated session in weeks listed below. All laboratory and tutorial sessions will be held in 27B14. Scheduled lab sessions are for Weeks 2, 5, 9, 12 and 13. In addition to the compulsory lab session, there are compulsory tutorials designed to assist you complete the lab-based assessments. Each tutorial is 2 hours long, and will be held in Weeks 3, 6 and 10. Tutorials will be held in the lab but you will not need a lab coat. Both laboratory and tutorial sessions are compulsory and essential for successful completion of Lab Assessments 1, 2, and 3.

Students are required to attend their allocated lab session.

3b Timetable of activities, such as lectures/ tutorials/ practicals/ field classes, showing key dates and topics

<table>
<thead>
<tr>
<th>Wk</th>
<th>Week Starting Monday</th>
<th>Topic number</th>
<th>Lecture Topic 14B01, 12B50</th>
<th>Practical 27B14</th>
<th>Laboratory/Workshops/Field classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11 August</td>
<td>1</td>
<td>Energy and Metabolism</td>
<td>No class</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>18 August</td>
<td>2</td>
<td>Glycolysis and Gluconeogenesis</td>
<td>Lab 1</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Day</td>
<td>Title</td>
<td>Notes</td>
<td></td>
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<td>------------</td>
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<td>------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>25 Aug</td>
<td>Glycogen Metabolism and Principles of Regulation</td>
<td>Tutorial 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1 Sep</td>
<td>Lipid Metabolism</td>
<td>No class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8 Sep</td>
<td>Revision</td>
<td>Lab 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>15 Sep</td>
<td>Mid-semester exam</td>
<td>Tutorial 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>22 Sep</td>
<td>Amino Acid Metabolism</td>
<td>No class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>29 Sep</td>
<td>CLASS FREE PERIOD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>6 Oct</td>
<td>Citric Acid Cycle</td>
<td>Lab 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>13 Oct</td>
<td>No lecture</td>
<td>Tutorial 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>20 Oct</td>
<td>Electron Transport Chain</td>
<td>No class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>27 Oct</td>
<td>Integration of Metabolism</td>
<td>Lab 4a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>3 Nov</td>
<td>Revision</td>
<td>Lab 4b</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>10 Nov</td>
<td></td>
<td>EXAMINATION PERIOD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>17 Nov</td>
<td></td>
<td>EXAMINATION PERIOD</td>
<td></td>
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</tr>
</tbody>
</table>

### 4: Unit Resources

**4a** Lists of required texts/readings

Recommended reading:

For Unit readings and resources in the University of Canberra Library
- [Link to search page for Unit Readings](#) (print materials)
- [Link to search page for eReserve](#) (electronic materials)

**4b** Materials and equipment

All students must download the laboratory manual from the Moodle site. It contains all the information regarding laboratory practical sessions. All students must also bring a lab coat to all lab sessions. Laboratory coats can be purchased from the UCU Shop or disposal stores. Students should bring their own safety glasses to all lab sessions.
4c  Unit website
To find your unit site online, login to LearnOnline(Moodle) using your student ID.

Note: Your unit site has a profiles page that displays your name and email address for the benefit of other students. If you prefer to hide your email address, click here for instructions.

5:  Assessment

All staff and students are required to read the document named ‘Assessment Responsibilities’ on the following link to ensure accurate understanding of the various perspectives surrounding assessment at UC. It can alleviate many misunderstandings.

5a  Assessment overview

<table>
<thead>
<tr>
<th>Assessment item (including exams held in the exam period)</th>
<th>Due date of assignments</th>
<th>Weighting (total to equal 100%)</th>
<th>Addresses learning outcome(s)</th>
<th>Related generic skill(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid Semester exam (50 minute closed book)</td>
<td>Wednesday Sept 17th (week 8)</td>
<td>25 %</td>
<td>1-3</td>
<td>1,2,4,5</td>
</tr>
<tr>
<td>Lab assessment 1</td>
<td>Friday, Sep 5th</td>
<td>Lab 1 = 5%</td>
<td>4</td>
<td>1-3,5</td>
</tr>
<tr>
<td>Lab assessment 2</td>
<td>Friday, Sep 26th</td>
<td>Lab 2 = 10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lab Assessment 3</td>
<td>Friday Nov 14th</td>
<td>Lab 3 = 20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Final Exam</td>
<td>Examination Period</td>
<td>40 %</td>
<td>1-3</td>
<td>1,2,4,5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>100 %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key for UC Generic Skills
1 - Communication
2 - Analysis and Inquiry
3 - Problem Solving
4 - Working independently and with others
5 - Professionalism and Social Responsibility

5b  Details of each assessment item
Lab Assessments 1, 2 and 3
- Details of requirements can be found in the unit laboratory manual. Support for completing Lab Assessments 1, 2, and 3 will be provided during lab sessions (compulsory attendance)
- The lab assessments are due by 11pm of Friday Sept 5th (Lab assessment 1), Friday Sep 26th (Lab assessment 2) and Friday Nov 14th (Lab Assessment 3). Lab assessments 1,2 and 3 will be submitted electronically ONLY via the Moodle dropbox. Each should be submitted as a single document. Electronic copies may be used to check for plagiarism

Pass/fail standards for the Lab Assessments 1, 2 and 3

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Pass standard</th>
<th>Fail standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and understanding of material</td>
<td>Basic knowledge and understanding of major concepts</td>
<td>Major gaps in basic knowledge and understanding</td>
</tr>
</tbody>
</table>
Presentation of results

| All raw data collected, presented and analysed to a basic standard, according to the questions asked in the Lab assessments 1 and 2. Some discussion and reflection of results and skills gained in the laboratory included. |
| Raw data missing, or not presented appropriately. Little or no discussion of results. No reflection of results and skills gained in the laboratory. |

Analysing a scientific journal article

| Some demonstration of the understanding the content and relevance of the scientific journal articles |
| Little or no demonstration of understanding the content and relevance of the scientific journal article. |

Ability to perform biochemical calculations

| Correct answers (including appropriate units) for calculations. |
| Incorrect answers (including absence of appropriate units) for calculations. |

Please note: while you are encouraged to discuss the lab results and questions with your peers and tutors, the discussions and answers you include in your Lab Assessments 1, 2, and 3 must be your own, or cited where appropriate.

Participation requirements

Attendance to all laboratory classes is compulsory. As you arrive in the lab, your participation will be recorded by scanning your student ID card.

To avoid any penalties, in the case of illness, medical or counselling certificates must be presented to Katie Cohen (convenor) or electronically. You will need a certificate for every laboratory class that you may have missed. Students who possess a medical or counselling certificate will be required to obtain raw data from the missed lab from another student, and complete the lab assessment as if they had attended the lab class missed.

Mid-semester exam:
The mid semester exam will comprise multiple choice and short answer questions.

Time/date: 9:30 am – 10.30am, Wednesday 17th Sept (week 6)
Venue: 14B1
Duration: 50 minutes

Materials permitted: Calculator – scientific
Pen, pencil, eraser, ruler and non-annotated language dictionary (English/foreign)

Final exam:

Time/date: Exam period
Duration: 2 hours
Materials permitted: Calculator – scientific
Non-annotated language dictionary (English/foreign)

Description: The exam will comprise of definitions and short answer questions directly related to lecture and reading material on all topics covered in this subject. Some metabolic pathways will be provided in the examination paper – see the unit website for details.

The specific assessment criteria are as follows:

- Demonstration of knowledge and understanding of the relevant theory covered in all topics.
- Capacity to answer the question asked.
- Capacity to integrate material from different topics of the subject.
- Capacity to present biochemical information intelligibly in a written format.
Pass/fail standards for both the Mid-Semester and Final Exam

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Pass standard</th>
<th>Fail standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and understanding of material</td>
<td>Basic knowledge and understanding of major concepts</td>
<td>Major gaps in basic knowledge and understanding</td>
</tr>
</tbody>
</table>

Feedback on all assessment items will be provided in a timely and constructive manner.

5c Submission of assessment items
All assessment items must be uploaded to Moodle.

Students will be asked to confirm the following online declaration at the point of submission.
I certify that:

• the attached assignment is my own work and no part of this work has been written for me by any other person except where such collaboration has been authorised by the lecturer/s concerned;
• material drawn from other sources has been fully acknowledged as to author/creator, source and other bibliographic details according to unit-specific requirements for referencing; and
• no part of this work has been submitted for assessment in any other unit in this or another Faculty except where authorised by the lecturer/s concerned.

The first page of each assessment submission should include the following information:

Student Name:
Student ID:
Assessment Name:
Date of Submission:
Word Count (if applicable):

Late submission of assignments
Late submission of assignments without an approved extension will result in the assignment not being marked and zero being recorded for that particular assignment. In extenuating circumstances a late submission may be considered upon the production of supporting documentation and at the discretion of the unit convener.

Extensions: Extensions must be applied for before the due date
Students can apply for an extension to the submission due date for an assessment item on the grounds of illness or other unavoidable and verifiable personal circumstances. Documentary evidence will be expected for an extension to be granted.

It should be noted that such documentation will be considered but will not guarantee that the application will be successful. The Unit Convener will decide whether to grant an extension and the length of the extension.

Responsibility for understanding
If there is any doubt with regard to the requirements of any particular assignments or assessment procedure, the onus for clarifying the issue rests with the student who should contact the unit Convener or tutor. Further, it is the responsibility of students to ensure that they are correctly enrolled in the unit and that the tutor and Student Administration have their correct contact details.
Provisions will be made for students who are unable to sit the mid-semester test and produce appropriate medical certificates or other documentation. **In the event a student misses the mid-semester test** due to illness or other exceptional circumstances (refer to eligibility criteria), they must submit a Faculty of ESTeM Science Deferred Examination Request form (available on Moodle), along with appropriate documentation (original or certified copy), within 3 working days to the ESTeM Academic Program Office (either by email ESTeM-courseadvice@canberra.edu.au or in person Room 6C38). If their request is approved students will be allowed to sit a deferred mid-semester test at a later date (as chosen by the unit convener).

**In the event a student misses the end of semester examination** due to illness or other exceptional circumstances, the procedures outlined on http://www.canberra.edu.au/student-services/examinations/alternative-exams must be followed (including submitting the online deferred application form within 3 days of scheduled exam to the Examinations Office).

5d **Special assessment requirements**

Normally an aggregate mark of 50% is required to pass the unit.

The unit convener reserves the right to question students orally on any of their submitted work.

5e **Supplementary assessment**

Supplementary assessment will usually only be offered to students who have failed a single unit in their final semester with a final mark between 45-49% and the unit is required for course completion. Refer to the UC Supplementary Assessment Policy.

5f **Academic Integrity**

Students have a responsibility to uphold University standards on ethical scholarship. Good scholarship involves building on the work of others and use of others’ work must be acknowledged with proper attribution made. Cheating, plagiarism, and falsification of data are dishonest practices that contravene academic values. Please see UC’s Student Conduct Rules.

To enhance understanding of academic integrity, it is expected that all students will complete the LearnOnline Academic Integrity Module (AIM) at least once during their course of study. The module is automatically available as a listed site when students log into LearnOnline.

5g **Use of text-matching software**

The University of Canberra has available, through LearnOnline (Moodle), text-matching software that helps students and staff reduce plagiarism and improve understandings of academic integrity. Known as URKUND, the software matches submitted text in student assignments against material from various sources: the internet, published books and journals, and previously submitted student texts. Click here for further information on the URKUND text-matching software.

6: **Student Responsibility**

6a **Workload**

The amount of time you will need to spend on study in this unit will depend on a number of factors including your prior knowledge, learning skill level and learning style. Nevertheless, in planning your time commitments you should note that for a 3cp unit the total notional
workload over the semester or term is assumed to be 150 hours. These hours include time spent in classes. The total workload for units of different credit point value should vary proportionally. For example, for a 6cp unit the total notional workload over a semester or term is assumed to be 300 hours.

6b Inclusion and Welfare
Students who need assistance in undertaking the unit because of disability or other circumstances should inform their Unit Convener or Inclusion and Welfare as soon as possible so the necessary arrangements can be made.

6c Participation requirements
Attendance at the mid-semester and the final exam is compulsory. Attendance to lab sessions and tutorials is compulsory. Lecture outlines will be available through the unit website. These notes are not a substitute for attending lectures or reading the prescribed textbook.

Participation (and attendance) at laboratory sessions is a requirement in order to complete the learning outcomes of this unit. Refer to “Participation requirements” in Section 5b “Details of each assessment item” for further information.

In all cases of absence, sickness or personal problems it is the student’s responsibility to ensure that the unit Convener is informed. The minimum participation requirement must be met in order to pass the unit (regardless of supporting documentation).

6d Withdrawal
If you are planning to withdraw please discuss with your unit convenor. Please see Withdrawal of Units for further information on deadlines.

6e Required IT skills
Basic knowledge of word processing software.

6f In-Unit Costs
There are no specific costs associated with this unit.

Note: To calculate your unit fees see: How do I calculate my fees?. The online UC Co-op Textbook Search is available for purchasing text books.

6g Work placements, internships or practicums
Not applicable

6h Additional information

Foundation of Unit
Theoretical foundations: This unit provides a comprehensive theoretical look at cellular metabolism. It examines the synthesis and breakdown of biochemical molecules as fuels and building blocks for the human body to function while emphasizing recurring themes in biochemical mechanisms and regulation. This knowledge is integrated with the practical component of this unit.

Research Led Education:
This unit involves research-led education and-integrated learning. There are active researchers involved in the design and delivery of this unit who are able to engage students in active learning and transmit to students their passion for the research they are carrying out.
Potential hazardous materials will be used as part of this unit. Risk assessments have been performed and control measures implemented to manage hazards and risks. Students have an obligation to comply with any safety directions issued by staff and to inform staff if incidents of a potentially hazardous nature occur. With respect to chemicals, staff will provide students with access to Material Safety Data Sheets.

It is essential that students be alerted to the potential danger of chemicals to which they may be sensitive. For example, if they should experience symptoms such as dizziness, headaches, a dry or sore throat, stinging or burning sensation in their eyes, fatigue or loss of concentration, students must inform their tutor and leave the laboratory immediately. Students may need to go to the University Health Centre if symptoms persist.

Provision of information to the group
Notifications through the Moodle Announcements Forum or the Moodle Discussion Forums are deemed to be made to the whole class. It is the responsibility of the student to ensure that they check for announcements on the Unit’s Moodle website (Moodle forum messages are also emailed to student email addresses only). Students should ensure they check their student email regularly. The Moodle discussion forums will be checked by staff regularly.

Use of student email account
The University Email policy states that “students wishing to contact the University via email regarding administrative or academic matters need to send the email from the University account for identity verification purposes”. Therefore all unit enquiries should be emailed using a student university email account. Students should contact servicedesk@canberra.edu.au if they have any issues accessing their university email account.

In all cases of absence, sickness or personal problems it is the student’s responsibility to ensure that the unit Convener is informed. The minimum participation requirement must be met in order to pass the unit (regardless of supporting documentation).

7: Student Feedback

All students enrolled in this unit will have an opportunity to provide anonymous feedback on the unit at the end of the Semester via the Unit Satisfaction Survey (USS) which you can access by logging into MyUC via the UC homepage: http://www.canberra.edu.au/home/. Your lecturer or tutor may also invite you to provide more detailed feedback on their teaching through an anonymous questionnaire.

As a result of student feedback, the following changes have recently been made to the unit:
1. The lab component has been revised to be more relevant to lecture material
2. The regime of the lab assessments has been altered to enable the students to gain more experience in writing scientific reports.

8: Authority of this Unit Outline

Any change to the information contained in Section 2 (Academic content), and Section 5 (Assessment) of this document, will only be made by the Unit Convener if the written agreement of the Program Director and a majority of students has been obtained; and if written advice of the change is then provided on the unit site in the learning management system. If this is not possible, written advice of the change must be then forwarded to each student enrolled in the unit at their registered term address. Any individual student who
believes him/herself to be disadvantaged by a change is encouraged to discuss the matter with the Unit Convener.

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