School of Biological Sciences

BIOL213: Principles of Biochemistry

Subject Outline
Autumn, 2015
On-Campus
Wollongong

Subject Information
Credit Points: 6
Pre-requisite(s): BIOL103 & CHEM101 or CHEM104 & CHEM102 or CHEM105
Co-requisite(s): Nil
Restrictions: Nil
Contact Hours: 2 hrs Lectures , 3 hrs Practical

Subject Contacts

Subject Coordinator/Lecturer
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Telephone: 61 2 4221 4916
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Consultation mode and times: Email for appointment

Lecturer/Demonstrator/Tutor
Name: Dr Jason McArthur
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Lecturer/Demonstrator/Tutor
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Consultation mode and times: Email for appointment

Lecturer/Demonstrator/Tutor
Name: Dr Ren Zhang
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Consultation mode and times: Email for appointment or Day, Time
Student Support and Advice
For general enquiries please contact the Student Centre:
Location: 41.152
Telephone: 61 2 4221 3492
Email: smah-students@uow.edu.au
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Section A: General Information

Subject Learning Outcomes

On completion of this subject, students should be able to:

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>a)</td>
<td>Describe the major classes of macromolecules and their subunits</td>
</tr>
<tr>
<td>b)</td>
<td>Describe the basic principles of enzyme function</td>
</tr>
<tr>
<td>c)</td>
<td>Describe the information flow from DNA to protein</td>
</tr>
<tr>
<td>d)</td>
<td>Perform the calculations necessary to relate physical amounts and concentrations of biochemicals</td>
</tr>
<tr>
<td>e)</td>
<td>Interpret biochemical data and reach valid scientific conclusions</td>
</tr>
<tr>
<td>f)</td>
<td>Display the following experimental skills</td>
</tr>
<tr>
<td></td>
<td>i) Safe and responsible conduct in laboratories</td>
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<tr>
<td></td>
<td>ii) The ability to dispense and manipulate small (μl) volumes accurately</td>
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<tr>
<td></td>
<td>iii) Use and understand the operation of a limited range of modern laboratory equipment</td>
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</tbody>
</table>

Subject Description


Graduate Qualities

The University of Wollongong has developed five graduate qualities (http://www.uow.edu.au/student/qualities/index.html), which it considers express valuable qualities that are essential for UOW graduates in gaining employment and making an important contribution to society and their chosen field. Student development of the following graduate qualities will be enhanced by their participation in this subject:

1. **Informed**: Have a sound knowledge of an area of study or profession and understand its current issues, locally and internationally. Know how to apply this knowledge. Understand how an area of study has developed and how it relates to other areas.
2. **Independent learners**: Engage with new ideas and ways of thinking and critically analyse issues. Seek to extend knowledge through ongoing research, enquiry and reflection. Find and evaluate information, using a variety of sources and technologies. Acknowledge the work and ideas of others.
3. **Problem solvers**: Take on challenges and opportunities. Apply creative, logical and critical thinking skills to respond effectively. Make and implement decisions. Be flexible, thorough, innovative and aim for high standards.
4. **Effective communicators**: Articulate ideas and convey them effectively using a range of media. Work collaboratively and engage with people in different settings. Recognise how culture can shape communication.
5. **Responsible**: Understand how decisions can affect others and make ethically informed choices. Appreciate and respect diversity. Act with integrity as part of local, national, global and professional communities.

eLearning Space

This subject has materials and activities available via eLearning. To access eLearning you must have a UOW user account name and password, and be enrolled in the subject. eLearning is accessed via SOLS (student online services). Log on to SOLS and then click on the eLearning link in the menu column. For information regarding the eLearning spaces please use the following link: http://uowblogs.com/moodlelab/files/2013/05/Moodle_StudentGuide-1petpo7.pdf
Lecture, Tutorial, Laboratory Times

All timetable information is subject to variation. Check the latest information on the university web timetable via the Timetable link under Study Resources on the Current Students webpage or log into SOLS to view your personal timetable prior to attending classes.

Readings, References and Materials

Textbooks:
The following text(s) will need to be purchased by students enrolled in this class.


Prescribed Readings (includes eReadings):
The following texts are prescribed for this subject, but students are not expected to purchase these. They are available to students through the library on the subjects eLearning site.

Nil

Materials:
UOW Approved Calculator
Laboratory Coat

Recommended Readings:
The following references complement the prescribed readings and textbooks:

Biochemistry (6th edition) Berg, Tymoczko & Stryer (574.192/49)
Biochemistry (3rd edition) Mathews, van Holde & Ahern (574.192/88)
iGenetics (3rd edition) Russell (576.5/5)

Recommended readings are not intended as an exhaustive list, students should use the Library catalogue and databases to locate additional resources.

Recent Changes to this Subject

i. Update to SLO’s
<table>
<thead>
<tr>
<th>Week</th>
<th>Week Commencing</th>
<th>Lecture</th>
</tr>
</thead>
</table>
| 1    | 02/03/2015      | Amino acids: properties  
Amino acids: functional groups |
| 2    | 09/03/2015      | Protein structure  
Characterisation/separation of proteins |
| 3    | 16/03/2015      | Carbohydrates & Glycobiology  
Nucleotides & Nucleic acids |
| 4    | 23/03/2015      | Lipids  
Membrane structure and function |
| 5    | 30/03/2015      | Research with Macromolecules  
Summary Lecture 1 |

**Mid-Session Recess**

| 6    | 13/04/2015      | Central Dogma genes & chromosomes  
Replication in prokaryotes and eukaryotes |
| 7    | 20/04/2015      | Transcription in prokaryotes  
Transcription in eukaryotes |
| 8    | 27/04/2015      | Introduction to translation  
Translation and protein modifications |
| 9    | 04/05/2015      | Research with the central dogma  
Summary Lecture 2 |
| 10   | 11/05/2015      | Protein Function & ligand binding  
Enzymes and how they work |
| 11   | 18/05/2015      | Enzyme Kinetics I  
Enzyme Kinetics II |
| 12   | 25/05/2015      | Enzyme Regulation  
Bioenergetics and Metabolism |
| 13   | 01/06/2015      | Research with enzymes  
Summary Lecture 3 |

**Study Recess**

*The above timetable should be used as a guide only, as it is subject to change. Students will be advised of any changes as they become known.*
### Section B: Assessment

#### Assessment Summary

<table>
<thead>
<tr>
<th>Assessment Item</th>
<th>Form of Assessment</th>
<th>Due Date</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessment 1</td>
<td>Practical Worksheets</td>
<td>By 2 pm on the Monday following each prac class</td>
<td>10%</td>
</tr>
<tr>
<td>Assessment 2</td>
<td>Mid-session Theory Quizzes</td>
<td>Weeks 6, 10, &amp; 13</td>
<td>25%</td>
</tr>
<tr>
<td>Assessment 3</td>
<td>Prac Quiz</td>
<td>Week 9 during prac class</td>
<td>10%</td>
</tr>
<tr>
<td>Assessment 4</td>
<td>Final Exam</td>
<td>During exam period</td>
<td>55%</td>
</tr>
</tbody>
</table>

**Total Marks 100%**

#### Details of Assessment Tasks

Assessment tasks will be marked using explicit criteria that will be provided to students prior to submission.

**Assessment 1**
- **Practical Worksheets**
- **Due date**: By 2 pm on the Monday following each prac class
- **Weighting**: 10%
- **Submission**: Submit a hardcopy of your assessment to the Student Centre
- **Type of Collaboration**: Individual Assessment
- **Length**: To be completed during and following each prac class
- **Details**: Will contain experimental data, calculations and short answer questions.
- **Style and format**: Reports

**Assessment 2**
- **Mid-session Theory Quizzes**
- **Due date**: Weeks 6, 10, & 13
- **Weighting**: 25%
- **Submission**: Submit a hardcopy of your assessment to your tutor/demonstrator in class
- **Type of Collaboration**: Individual Assessment
- **Length**: 30-40 min
- **Details**: Multiple choice and short answer questions
- **Style and format**: In-class test during Dry Pracs

**Assessment 3**
- **Prac Quiz**
- **Due date**: Week 9 during prac class
- **Weighting**: 10%
- **Submission**: Submit a hardcopy of your assessment to your lecturer in class
- **Type of Collaboration**: Individual Assessment
- **Length**: 30 min
- **Details**: Short answer questions
- **Style and format**: In-class test

**Assessment 4**
- **Final Exam**
- **Due date**: During exam period
- **Weighting**: 55%
- **Submission**: Exam papers and answers must be submitted at the conclusion of the exam.
- **Type of Collaboration**: Individual Assessment
- **Length**: 3 hours
- **Details**: Multiple choice and short answer questions covering both theory and practical content
- **Style and format**: Final Exam
Minimum Requirements for a Pass in this Subject

To receive a clear pass in this subject a total mark of 50% or more must be achieved. In addition, failure to meet any of the minimum performance requirements is grounds for awarding a Technical Fail (TF) in the subject, even where total marks accumulated are greater than 50%.

The minimum performance requirements for this subject are:

- Achieve a minimum mark of 45% on the final examination (no matter what your mark is prior to the exam)

Minimum Student Attendance and Participation

It is expected that students will allocate 12 hours per week to this subject, including any required class attendance, completion of prescribed readings and assessment tasks.

Student attendance at tutorials and practicals is compulsory and students must attend at least 100% of classes. Absences will require the submission of an application for Academic Consideration via SOLS and the presentation of suitable documentation, for example a Medical Certificate, to Student Central as soon as practical. For further details about applying for academic consideration visit the Student Central webpage: http://www.uow.edu.au/student/central/academicconsideration/index.html

If you miss more than one practical for whatever reason, see the subject coordinator as soon as possible. All practicals are assessable whether attended or not, therefore the onus is on you to catch up on any material that you may have missed. You must do this by personal study and by seeking assistance from lecturers and/or demonstrators if necessary.

Scaling

Scaling may occur in this subject at the end of session by the Unit Assessment Committee and/or Faculty Assessment Committee (FAC). Marks will only be scaled to ensure fairness/parity of marking across groups of students. Scaling will not affect any individual student’s rank order within their cohort. For more information refer to Assessment Guidelines – Scaling: http://www.uow.edu.au/about/policy/UOW058609.html

Late Submission

Late submission of an assessment task without an approved extension of the deadline is not acceptable. If you are unable to submit an assessment due to extenuating circumstances (e.g. medical grounds or compassionate grounds), you can make an application of academic consideration. Not all circumstances qualify for academic consideration. For further details about applying for academic consideration visit the Student Central webpage: http://www.uow.edu.au/student/central/academicconsideration/index.html

Late Submission Penalty

Late submission of an assessment task without an approved extension of the deadline is not acceptable. Marks will be deducted for late submission at the rate of 10% of the total possible marks for that particular assessment task per day. This means that if a piece of work is marked out of 100, then the late penalty will be 10 marks per day (10% of 100 possible marks per day). The formula for calculating the late penalty is the total possible marks x 0.10 x number of days late. For the purposes of this policy a weekend (Saturday and Sunday) will be regarded as two days.

No marks will be awarded for work submitted after the assessment has been returned to the students.

Supplementary Assessments

Supplementary assessment may be offered to students whose performance in this subject is close to
that required to pass the subject, and are otherwise identified as meriting an offer of a supplementary assessment. The precise form of supplementary assessment will be determined at the time the offer of a supplementary assessment is made.

Students can log on to SOLS and click on the link titled “Supplementary Assessment" to view any applicable offers. Addition information on supplementary assessments is available at: http://www.uow.edu.au/student/exams/suppassess/index.html

System of Referencing Used for Written Work
The Author-Date (Harvard) referencing system should, unless otherwise specified for a particular assessment (check Details of Assessment Tasks), be utilised. A summary of the Harvard system can be accessed on the Library website at: http://public01.library.uow.edu.au/refcite/style-guides/html/

Use of Internet Sources
Students are able to use the Internet to access the most current information on relevant topics and information. Internet sources should only be used after careful critical analysis of the currency of the information, the role and standing of the sponsoring institution, reputation and credentials of the author, the clarity of the information and the extent to which the information can be supported or ratified by other authoritative sources.

Plagiarism
The full policy on Academic Integrity and Plagiarism is found in the Policy Directory on the UOW website.

“The University's Academic Integrity and Plagiarism Policy, Faculty Handbooks and subject guides clearly set out the University's expectation that students submit only their own original work for assessment and avoid plagiarising the work of others or cheating. Re-using any of your own work (either in part or in full) which you have submitted previously for assessment is not permitted without appropriate acknowledgement. Plagiarism can be detected and has led to students being expelled from the University.

The use by students of any website that provides access to essays or other assessment items (sometimes marketed as 'resources'), is extremely unwise. Students who provide an assessment item (or provide access to an assessment item) to others, either directly or indirectly (for example by uploading an assessment item to a website) are considered by the university to be intentionally or recklessly helping other students to cheat. This is considered academic misconduct and students place themselves at risk of being expelled from the University.”

Submission of Assessments
Refer to the submission requirements under the details of the individual assessments. Students should ensure that they receive a receipt/evidence acknowledging assessment submission. Students will be required to produce this in the event that an assessment task is considered to be lost. Students are also expected to keep a copy of all their submitted assignments in the event that re-submission is required.

PRACTICAL WORKSHEET SUBMISSION ONLY
Assessments submitted at the Student Centre must have a SATS (Student Assessment Tracking System) coversheet attached to the front of the assessment. Instructions for generating a coversheet can be found on: http://smah.uow.edu.au/current-students/UOW151958.html

For an assessment to be successfully submitted at the Student Centre, please note the following:

The coversheet must be signed and dated.
The assessment must have the correct coversheet i.e. the correct subject code and tutorial group (if applicable).
A legible barcode with all numbers and digits below e.g. UOW20121007656. Assessments must be submitted by 4:00pm on the due date.

If an assessment is submitted to the Student Centre without any of the above we will contact you through your student email address and advise that you need to return to the Student Centre with the correct coversheet. Your assessment won’t be considered submitted until the correct coversheet is attached. This might mean that your assessment is submitted late.

An email receipt will be issued on the same day as submission of assessments and students are required to retain this receipt until they have received the final mark for that assessment task. It is your responsibility to contact the Student Centre if you have not received this receipt by the following business day. The receipt is proof of submission of assessments and students will be required to produce this in the event that an assessment task is considered to be lost. Students are also expected to keep a copy of all their submitted assessments in the event that re-submission is required. SATS Group Assessment Coversheets are printed by the lead member of the group and subsequent names can be added in the SATS student interface before printing. All members of the group must sign the printed SATS Group Assessment Coversheet before submitting the assessment.

Note that if assessments are submitted in the after-hours slot at the Student Centre it will be scanned into SATS the following business day. Assessments submitted via post will be scanned into SATS on the day of delivery. Any assessments received without the correct assessment coversheet attached will not be accepted by SATS. It is the student’s responsibility to ensure that the correct assessment coversheet is submitted with their assessment.

Students may post their assessments to: the Student Centre (41.152), University of Wollongong, Wollongong, NSW 2522.

Assessments will be considered submitted on the date of postage. It is the student’s responsibility to ensure they have evidence of their submission date if it arrives at the office after due date.

**Assessment Return**

Students will be notified when they are able to view their marked assessment. In accordance with University Policy marked assignments will usually only be held for 21 days after the declaration of marks for that assignment.

**PRACTICAL WORKSHEET ASSESSMENT RETURN ONLY**

Students will be notified by email when marked SATS assessments are available for collection from the Student Centre during business hours. Students will be required to present their student card when collecting marked assessments. Subject Coordinators/ Tutors may opt to hand marked assessments back to students in class or during their consultation hours. In accordance with University Policy marked assessments will usually only be held for 21 days after the declaration of marks for that assessment.

- The Student Centre (41.152)
  Business Hours & Location:
  Monday – Friday
  9:00 am to 4:30 pm
  Building 41.152
Section C: General Advice

Students should refer to the Faculty of Science, Medicine and Health website for information on policies, learning and support services and other general advice.

University Policies

Students should be familiar with the following University policies:

a. Code of Practice – Teaching and Assessment

b. Code of Practice – Research, where relevant

c. Code of Practice – Honours, where relevant

d. Student Charter

e. Code of Practice – Student Professional Experience, where relevant

f. Academic Integrity and Plagiarism Policy

g. Student Academic Consideration Policy

h. Course Progress Policy

i. Graduate Qualities Policy

j. Academic Grievance Policy (Coursework and Honours Students)

k. Policy and Guidelines on Non-Discriminatory Language Practice and Presentation

l. Workplace Health and Safety, where relevant

m. Intellectual Property Policy

n. IP Student Assessment of Intellectual Property Policy, where relevant

o. Policy on Ethical Objection by Students to the Use of Animal and Animal Products in Coursework Subjects, where relevant

p. Human Research Ethics Guidelines, where relevant

q. Animal Research Guidelines, where relevant
r. Student Conduct Rules and accompanying Procedures or Research Misconduct Policy for research students

Student Support Services and Facilities
Students can access information on student support services and facilities at the following link. This includes information on “Academic Support”, “Starting at University”, “Help at University” as well as information and support on “Career’s and Jobs”. http://www.uow.edu.au/student/services/index.html

Student Etiquette
Guidelines on the use of email to contact teaching staff, mobile phone use in class and information on the university guide to eLearning ‘Netiquette’ can be found at http://www.uow.edu.au/student/elearning/netiquette/index.html

Version Control Table

<table>
<thead>
<tr>
<th>Version Control</th>
<th>Release Date</th>
<th>Author/Reviewer</th>
<th>Approved By</th>
<th>Amendment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20150123</td>
<td>Dr Tracey Kuit</td>
<td>Ashleigh Rae</td>
<td>Final BIOL213 Autumn 2015 outline.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subject Coordinator</td>
<td>ADE Nominee</td>
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</tbody>
</table>