



Unit Outline: Biochemistry 233. Semester 1 2012

Unit Index No:	311406
Credit points:	25
Co-requisite Units:	Chemistry 123, Chemistry 181, Medical Laboratory Science 132, Biomedical Techniques 132 or Biomedical Science 100
Online Teaching Unit Category	Essential. Unit materials and resources are available from the unit's Blackboard site. The online unit site is designed to be a significant component of the unit. It is a requirement for students to have full internet and web access.
Requirements:	Ownership of, or access to, recommended textbook (or companion/supplementary textbook). Ownership of, or access to, appropriately configured computer with internet and web access (either on or off campus).
Tuition Pattern	2 x 1h lectures and 1 x 3h practical or feedback or tutorial
Study Load	About 10 to 12 hours including lectures and practicals (depends upon prior knowledge and ability)
Unit Coordinator	Dr Steven Bottomley Room 308:204 School of Biomedical Sciences Curtin University of Technology email: s.bottomley@curtin.edu.au phone: (08) 9266 4369 fax: (08) 9266 2342

This document is important, so please read it carefully before commencing your study in this unit.

**SCHOOL OF
BIOMEDICAL SCIENCES**

Welcome!

Welcome to Biochemistry 233 and congratulations! You have reached an important second year unit in your progress towards your degree!

This unit is designed to expand your knowledge, develop your skills, and provide you with an introduction to biochemistry. Biochemistry is the chemistry of life and is all about trying to find out how life works at the molecular level!

Most advances in medicine, agriculture and industry evolve from an understanding of fundamental biochemistry. For example, the discovery of insulin in 1922 by Banting and Best has saved many millions of lives. A day rarely passes without the report of a biochemical discovery that benefits people.

Your achievement of the learning outcomes in this unit will depend upon your diligent efforts to keep pace with the lecture and practical content; your ability to study your text and reference materials; actively participate in all learning and assessment activities; take the opportunity to ask questions; and to explore the subject.

Take the time to read this unit outline carefully and thoroughly. It explains most of what you need to know about Biochemistry 233.

We hope you will find this unit enjoyable, challenging, and rewarding. We particularly hope that it stimulates your interest in biochemistry and the biomedical sciences to the extent that you go on to pursue your studies at a higher level.

All the best and enjoy!

Dr Steven Bottomley
Unit Coordinator
Biochemistry 233

Aims

Molecules are the principal building blocks of life. Their structure, function and organisation are the basis of biochemistry. This unit is designed to provide you with a broad theoretical and practical introduction to the biochemistry that underpins courses in biology, medicine, dentistry, nutrition, veterinary sciences, and pharmacy. We have also designed this unit to help you develop your thinking, practical, and affective skills.

Unit Coordinator and Lecturers

Your unit coordinator is Dr Steven Bottomley. If you have any questions or requests specifically relating to your ability to conduct Biochemistry 233, then you should contact your unit coordinator. Contact details are listed on the first page of this unit outline. Your lecturers for this unit will be Dr Steven Bottomley, Professor Erik Helmerhorst, and possibly Professor Philip Newsholme and other invited lecturers. You will also have other professional staff or postgraduate students as laboratory demonstrators.

Availability of lecturers

Biochemistry lecturers are always approachable and welcome your questions. Do not be afraid to ask the lecturer questions. However, please be aware that the demands on a lecturer's time are very great and the lecturer may not be able to respond immediately to your question (either from a personal visit, telephone call, email, or note). Please also note that the university has limited a lecturer's time for all activities including the activities of consultation, assessment, and feedback (see later).

Generally, all biochemistry lecturers have an 'open door' policy. This means that the lecturers are available at most times during semester for student consultation and questions. However, this does not mean that you can 'barge in' and demand attention at any time you like. It is polite to enquire if the lecturer is available to meet with you. If the lecturer can't see you immediately, or you need to establish a definite time for the meeting, then you will be required to make an appointment. There may also be times during semester where the lecturer, for whatever reason, is unavailable for any student consultation.

If for some reason, you feel you can't approach the lecturers in person then take advantage of the other ways of communicating with lecturers such as: telephone, during class (by asking questions), by the Blackboard bulletin board, by Blackboard email, internet email, or even by a note left in the lecturer's mail box (found outside the office on the ground floor in Building 308)!

Learning Biochemistry, Thinking Skills, and Unit Learning Outcomes

There are various ways to describe and explain how people learn. One popular way proposes that there are three categories of learning: Cognitive (thinking skills), psychomotor (manual and physical skills), and affective (feelings and emotions)¹. That is, you learn by thinking, doing and feeling! Much of Biochemistry 233 will focus on helping you develop your thinking and manual skills in biochemistry. Most of these skills will be directly assessed as outlined below.

Unit Learning Outcomes

Learning outcomes are a useful guide for you to know what to expect from the unit and what to expect from yourself. You may forget some of the content of biochemistry in the future, but the thinking skills you develop in this unit will last you a lifetime. This is called 'lifetime learning'. Both theoretical and practical aspects of biochemistry are covered. The table below shows the five learning outcomes, how the outcomes are assessed, and the level of thinking¹, and practical, skills addressed by the outcomes.

Learning Outcomes	Assessment of Outcomes	Thinking or Practical Skills¹ Addressed
Critically examine key concepts of biochemistry fundamental to life	Mid semester exam End of semester exam Practical Record of Completed Activities	Remember Understand Apply Analyse
Integrate critical thinking skills into the evaluation, critique, and design of biochemical information	PeerWise	Remember Understand Apply Analyse Evaluate Create
Use computers and other appropriate technological tools to manage and analyse scientific data	Practical Record of Completed Activities	Remember Understand Apply Analyse
Apply new and existing knowledge to solve problems in biochemistry	Mid semester exam End of semester exam Practical Record of Completed Activities	Remember Understand Apply Analyse
Demonstrate competence and safety in laboratory practice	Practical Record of Completed Activities Laboratory Book	Remember Understand Apply

¹ Krathwohl, D.R. (2004) A Revision of Bloom's Taxonomy: An overview *Theory into Practice* 41(4): 212-218

Unit Learning Outcomes – Affective Attributes

Affective attributes such as: awareness, politeness, active participation in class, working both cooperatively and independently, taking responsibility for your own learning, and organizational ability will not be formally assessed (that is you don't receive a grade), but are 'noticed'. What use is this to you? Well, if you require a reference from your lecturer or unit coordinator for a potential employer, scholarship application, or professional position then the lecturer may use what they remember of your affective attributes when providing the reference.

Developing Self-Knowledge in Biochemistry

It is a good idea to constantly ask yourself how you are approaching your study in biochemistry. Think about your strategies for study and learning in biochemistry. Reflect on what you do and how you could do something better or differently. Question what you do, how you do it, and why you do it! You may use your laboratory notebook, or any other notebook (or computer) as a place to record your reflections.

Syllabus

The syllabus includes biochemical knowledge such as: Properties and structure of amino acids. Structure and properties of water. Concepts of pH, pK and buffers. Molecular structure and chemical bonds. Structure and function of globular and fibrous proteins. Structure and function of lipids and carbohydrates. Concepts and properties of enzymes including enzyme kinetics. Computer aided molecular visualization of proteins. Laboratory techniques and computer analysis of experimental data. Overview and concepts of biological thermodynamics, energy metabolism and metabolic pathways. Intermediary metabolism including metabolic pathways of glycolysis, citric acid cycle, pentose phosphate pathway, amino acid metabolism, fatty acid metabolism, ketone body metabolism, oxidative phosphorylation, and electron transport.

This syllabus is covered throughout semester by a combination of lectures, assignments, practicals, and feedback sessions. You are also expected to take an active role in your own learning by organizing your own reading and studying for greater understanding.

Special note: We are constantly reviewing the syllabus, and teaching approach, of Biochemistry 233. Consequently, you may find changes occurring in lecture content, timing, or teaching approach throughout the semester. This may lead to a little inconvenience (in that the topics in the schedule may be altered), but this is certainly **not** an indication of disorganisation. These changes hopefully benefit students by offering updated material and a better learning experience. This can also benefit you by allowing you to be more competitive, and knowledgeable, in your future careers. Finally, you may find that you are asked for your feedback on any potential change in syllabus.

Unit Materials

Textbooks and References

The recommended textbook for this unit is:

Harvey, R.A., Ferrier, D.R., (2011) *Lippincott's Illustrated Reviews: Biochemistry*. 5th Edition. Lippincott Williams & Wilkins.

The earlier edition of this textbook will also suffice. This textbook contains most of the biochemical knowledge needed for this unit and closely follows most of the syllabus. However, no textbook is 'perfect' and you will need to use other textbooks, journal articles, and various other resources to help you with your learning. Other textbooks and references you may find useful include:

- Nelson, D.L., and Cox, M.M., (2008) *Lehninger. Principles of Biochemistry* 5th Edition. Worth Publishers
- Berg J.M., Tymoczko, J.L., & Stryer, L. (2002) *Biochemistry* (5th ed) WH Freeman & Company. New York
- Devlin, T.M. (Ed). (2002) *Textbook of Biochemistry with Clinical Correlations* (5th ed)Wiley-Liss. New York
- Garret, R.H. & Grisham C.M. (1999). *Biochemistry* (2nd ed). Saunders College Publishing. New York
- Horton et al. (2002) *Principles of Biochemistry* 3rd Edition. Prentice Hall
- Mathews, C.W., van Holde, K.E., & Ahern, K.G. (2000) *Biochemistry* (3rd ed). Benjamin/Cummings Publishing Company
- Murray, R.K., Granner, D.K., Mayes, P.A., Rodwell, V.W. (2003) *Harper's Illustrated Biochemistry*. 26th Edition. McGraw-Hill.
- Stephenson, WK (1988) *Concepts in Biochemistry* 3rd Edition John Wiley & Sons
- Stryer, L. (1995) *Biochemistry* (4th ed). WH Freeman & Company
- Voet, D. & Voet, J.G. (2004). *Biochemistry*. 3rd Edition. John Wiley & Sons.
- Osgood, M, and Ocorr, K (2000) *The Absolute, Ultimate Guide to Lehninger Principles of Biochemistry (3rd Edition) Study Guide and Solutions Manual*. Worth Publishers.
- Zubay, G.L. (1999) *Biochemistry* (4th ed) WC Brown Publishers

The Curtin University library has some of these and other books on biochemistry, so visit the library! Some biochemistry textbooks can be borrowed from the School and are kept in a locked bookcase in building 308 on the first floor. You need to see the School administration officer to borrow books. Various other resources to help you with your study include journal articles, the internet (some useful web sites are listed below, in the study guide, and on the Blackboard site), your friends, colleagues, tutors, lecturers, and professional people you know.

Web-Based Resources

You will be referred to various resources, including course notes, information, and practice assessments on the World Wide Web. In particular, you will need to gain access to Curtin University's internet teaching platform called Blackboard. You should now be able to effectively explore the internet where there is a wealth of freely available information. You may also be referred to some web sites during the course of your study.

Please Note: When using the internet you must ensure that the source of information comes from a reputable, qualified, and professional institution or person.

Useful web sites include:

- Biochemistry 233 Blackboard site. This can be accessed from your Oasis account or from <http://lms.curtin.edu.au>
- Curtin University library have various guides for study and research skills see: <http://library.curtin.edu.au/study-and-research-tools/index.cfm>
- School of Biomedical Sciences Biochemistry web site: <http://www.biomed.curtin.edu.au/>
- If you use the Harvey & Ferrier. (2011) *Biochemistry* textbook then each text has a code on the inside of the front cover to access the text book's web site
- Molecular visualization software 'jAMVLE' web site: <http://wabri.org.au/jamvle/>

Learning Aids

The learning aids for this unit are extensive and include:

- Your textbook
- Your lectures, iletures, and Adobe Acrobat (pdf) files of lectures
- The various web-based resources listed above
- 'Questions for learning - online'. These are various online (via Blackboard) multiple choice, and short answer, questions that cover the unit syllabus and learning outcomes.
- 'Questions for learning – practicals'. These are various short answer questions provided in your laboratory study guide or through your laboratory activities
- 'Questions for learning – lectures'. These are various multiple-choice or short answer questions given during some of the lectures
- PeerWise Assignment (see PeerWise later)
- Feedback and tutorial sessions. These are given usually during a scheduled practical session to review the laboratory activities and other aspects of the subject.
- The B233 Laboratory Techniques Study Guide
- Acid /Base Chemistry FAQ (Frequently Asked Questions) notes (on Blackboard)
- Revision of organic chemistry notes (on Blackboard).
- Enzyme simulation in an excel spreadsheet (on Blackboard)
- Interactive tutorials and resources at the School of Biomedical Sciences Biochemistry web site at: <http://www.biomed.curtin.edu.au/biochem/>
- Molecular visualisation program
- Blackboard bulletin board and email

You should make use of these aids to complement and enhance your own learning. Please note that iletures are provided to complement your lectures. You should note that iletures may not be available due to various unforeseen problems with the recording equipment or mistakes in organization.

Lectures, Practicals, Tutorials, and Study Load

This unit requires at least 5 hours per week allocated as follows:

- Lecture 2 x 1 hour
- Practical/Laboratory activities/Feedback/Tutorial Sessions 1 x 3 hours

Lectures

Attendance at all lectures is **strongly** recommended for the following reasons:

- Topics may be discussed and things may be drawn on the whiteboard that will not appear in the lecture notes, iletures, or in the textbook.
- The lecturer may cover material in a slightly different way or have a particular emphasis on some concepts that will not always be obvious in the lecture notes, iletures, or textbook.
- The lecturer may also cover material required to answer assessments that will not appear in the lecture notes or in the textbook.
- The lecturer may choose to use discussions, in-class activities, or other alternative teaching approaches instead of the usual lecture presentation. In these cases the material will not appear in lecture notes or iletures.
- Lectures are a convenient opportunity for you to ask your lecturer questions, to meet with your fellow students, and discuss the subject with your colleagues.
- Students who attend lectures generally have better marks than students who do not.

Most of the lecture presentations are available on the Blackboard site as a pdf or PowerPoint document and recorded as an ileture. However, iletures may not be available for all lectures and will depend upon which teaching approach is employed during the lecture.

Lectures are continually modified and updated. Consequently, some lectures may not yet be available on the Blackboard site. Where lecture notes are not provided it is still your responsibility to write your own lecture notes! In fact, even if lecture notes are provided it is still your responsibility to write your own lecture, and study, notes!

Please also understand the following:

- please do not always expect a lecture to always be a 'one-way' learning experience (lecturer to you) where you can 'sit back and relax'. You will be expected to think and to contribute during the lecture through activities such as: answering questions, asking questions, providing feedback, performing

calculations, and applying your knowledge. The lecture then becomes a more active and involved 'two-way' learning experience that will help you!

- lectures may not be sufficient study material to help you pass this unit! That is, you may need to do additional study if, for example, you do not have appropriate knowledge of chemistry or biology.
- lectures should be viewed as your study guide to each topic.
- parts of the syllabus may not be presented as lectures, but you still need to study and know these subjects. For example, some of the syllabus is covered by material in the textbook or in your practical laboratory activities.
- it is advisable that you read the lecture notes, appropriate chapters in your text, other books, or other credible sources of information before and after each lecture.
- not all questions in your assessments can be answered by simple regurgitation of lecture content. For example, problem solving questions will require you to integrate and apply your knowledge. (Please read the learning outcomes).
- your attention in the lecture is important for your learning. Consequently, please don't attend the lecture if you intend to talk with your friends about other things or if you want to 'sleep'. Any unnecessary, disruptive, or unrelated activity by students during lectures may result in the embarrassment of the student(s) being asked to leave the lecture.

Your understanding of each topic will only be achieved satisfactorily with broader reading of your text and other reference materials. Remember, it is your understanding of the topics that will be assessed in this unit! You may also find that you need to study more (or less) than other students depending upon your existing knowledge and ability. Please understand that ultimately you are responsible for your own learning!

We continually review the content of Biochemistry 233 in an attempt to keep it up to date, to implement new teaching and learning approaches, to (hopefully) make it interesting, and to account for the varying academic backgrounds of students. Consequently, lecture and practical content may be changed at any time at the discretion of the lecturer or unit coordinator. The subject of a lecture may be given earlier or later than that shown in the indicated schedule. Some lectures may also be extended or curtailed. These changes may also depend upon the perceived progress of the student cohort and other factors. However, these changes are always made with the intention that you will benefit from a better learning and teaching environment. You will also be notified of any changes that may affect assessments.

The academic background and capabilities of students entering second year at university does vary considerably each year. These differences may be due to students entering the unit with a different high school education, from a different faculty, from other institutions (local or international), or after some absence from education (e.g. as a parent returning to education after rearing children). Consequently, you should try to be considerate towards these other groups of students in your student cohort and try to understand why these changes need to be made (affective skills!).

Special note: We aim to conduct a gradual revision of the Biochemistry 233 syllabus, and teaching approach, starting 2011 with a complete revision likely to take a couple of years. Consequently, you may find that you are asked for your feedback on any potential

change in syllabus. You may also find changes occurring in lecture content, timing, or teaching approach throughout the semester. We cannot conduct this revision before the semester starts or during the 'semester break' because there is not enough time. The 'semester break' is often used for activities such as: student assessment (after semester), administration, various meetings, or research. We would also not be able to receive feedback from students during semester break.

Practicals

The practicals will comprise both 'hands on' activities and theoretical exercises to develop your thinking skills, manual skills, and help you achieve your practical learning outcomes (see above). The practical usually commences with a short outline of the practical session and a few questions. Please refer to the 'Introduction to Biochemistry 233 Laboratory' document on Blackboard for more details on how the practicals are organized, what you are expected to do, and how you will be assessed.

Practical sessions are conducted in either the 'wet labs' in 310.103A or the 'Computer Lab' in 308:104 according to the study schedule. Attendance at practical sessions is essential because, as a biomedical scientist in medical science, molecular biotechnology or human biology you need to learn the requisite laboratory skills. The laboratory officer for Biochemistry 233 will ensure that you have all the materials for your practical. Please note that at least one staff member (usually the laboratory officer, a laboratory demonstrator, or lecturer) will be available at all times in the laboratory area during the practical session.

Safety in Practical

The correct clothing must be worn to all laboratory sessions and the safety regulations must be observed at all times. Safety regulations are posted in the laboratory. These regulations are to help maximize your safety, so please ensure that you read and understand the regulations. Minimum safety clothing includes covered shoes, a full-length laboratory coat (covering arms, torso, and down to the top of the knees), and latex gloves when necessary (gloves will be provided in the laboratory). Laboratory coats are provided for you and cannot be taken out of the laboratory. Some practical procedures may also require safety spectacles. Students not wearing the required safety clothing, or not following the safety regulations, will be asked to leave the laboratory immediately. The supervising staff member may permit the student to return to the same class (within one hour of the start of the class) only if they have complied with the appropriate safety clothing and regulations.

Feedback

Feedback occurs when information is exchanged between you and your lecturers. You provide information to help the lecturers learn more about you, your knowledge, or correct any misunderstanding. Your lecturers provide you information to help you learn, correct any misunderstanding, or clarify what you need to do.

Feedback can occur at any time during semester either in class or out of class. In fact, there are specific 'Feedback' sessions during the practicals (as shown on the schedule). These feedback sessions are essential and are an excellent opportunity (in a relatively small class) for you to ask questions and both give and receive feedback on your laboratory activities, lectures, and assessments. These sessions can be a very useful way

to receive guidance and clarification on the entire syllabus. The activities in the feedback session will vary and may include: study activities, discussion of lectures, practicals, and assignments. The time taken for these sessions is variable and will depend to a certain extent on student participation. However, it will be no more than a usual practical session of three hours. You **MUST** take feedback seriously and don't be afraid to ask questions!

Feedback 'out of class' can occur through Curtin's Blackboard learning management system (e.g. Announcements and the Bulletin Board) by any other form of acceptable communication (e.g. email or personal appointment). You can also provide more formal feedback on your perceptions of the unit, and lecturers, through Curtin's eEvaluate system.

Tutorials

Tutorials may also be given in some of the practical sessions and may occur in addition to, and at the same time as, the feedback sessions. These tutorials may comprise additional activities that are designed to help you learn particular aspects of biochemistry.

Study Load

You will need to spend at least 4 to 5 hours a week **outside** of scheduled classes studying in this unit to be successful. This means that you will need to spend **at least 10** hours per week studying biochemistry. You may need more time if you don't have an appropriate background in chemistry or biology or you find some topics difficult.

Time allocated to Consultation, Assessment, and Feedback.

This unit involves assessment (designed and managed by the unit coordinator) and feedback through tutorials, lectures, and assessments. All lecturers, and the unit coordinator, in this unit are also available for personal consultation.

However, you should be aware that there are time constraints on the important activities of consultation, assessment, and feedback. This has arisen due to Curtin University recently implementing an Academic Workload Management System to manage and audit academic workloads. This system allocates time to various academic activities or duties (e.g. a total of four hours for preparing, and presenting, each lecture). Currently only 1 hour per student has been allocated in this unit for the combination of consultation, assessment, and feedback activities.

Assessment

Assessment in Biochemistry 233 is designed with the following aims:

- to help you learn biochemistry
- to give you various opportunities to demonstrate your learning and achievement of the learning outcomes. That is, your achievement in Biochemistry 233 does not depend upon just one exam.
- reward your performance for achieving the learning outcomes
- allow you to study continuously and NOT 'cram' at the end of semester

- provide appropriate and timely feedback
- discriminate between those students who do the work and those who do not
- establish, maintain, and protect internationally recognised academic standards

A summary of the assessment descriptions and requirements are listed in the following table. An overall mark of at least 50% of the total semester mark is required to pass this unit. However, this mark must also include the satisfactory completion of both exams, the PeerWise assignment, and the laboratory component of the assessment. If the laboratory component is not completed satisfactorily, then this will result in a 'Failed-Incomplete' (F-IN) grade being allocated at the end of semester regardless of the total mark achieved.

Biochemistry 233 Assessment Summary*			
Component	Description	Requirements	% Total Semester Mark
Mid Semester Online Exam	You must satisfactory complete this exam covering topics from weeks 1 to 6 of semester. This exam will be based on all 'Questions for Learning'. To be conducted in the Computer Assessment Centre. The exam will be available for one week commencing 16/04/12. There will be automatic assessment and feedback upon completion of this exam.	Satisfactory completion means that you achieve at least 50% of the assessment mark for BOTH the mid semester and end of semester exam. That is, at least 30% of your total semester mark is required for BOTH the mid semester and end of semester exams.	1 x 30 = 30
End of Semester Exam	You must satisfactory complete this exam covering topics from weeks 8 to 14 of the semester. This exam will be based on all 'Questions for Learning'. Details of the location, date, and time of the exam will be advised during semester.	As above for the mid semester exam.	1 x 30 = 30
Laboratory Activities	Satisfactory completion of all laboratory activities during semester. Must present results of activities in a written laboratory notebook that is always available for inspection during practical sessions.	Satisfactory completion means that you achieve at least 50% of the assessment mark. That is, at least 12.5% (or 15% if you do not participate in the concept survey) of your total semester mark is required for this assessment. However, if you decide not to participate in the Concept Surveys then the pass rate is at least 15% of your total semester mark.	1 x 25 = 25 if participating in the concept survey 1 x 30 = 30 if you do not participate in the concept survey
PeerWise Assignment	Satisfactory completion of PeerWise assignment according to specific marking criteria. PeerWise is conducted throughout the semester. Further details of the PeerWise assignment are given in the unit outline and in separate documents.	Satisfactory completion means that you achieve at least 50% of the assessment mark. That is, at least 5% of your total semester mark for this assignment.	1 x 10 = 10
Concept Surveys	Satisfactory participation in concept surveys at the beginning and end of semester. There will be no score with these surveys	Satisfactory participation means that you are conscientious and that you attempt ALL questions in the survey to the best of your abilities.	1 x 5 = 5
Total Mark			100

*Details of the assessment may change at any time at the discretion of the unit coordinator. However, you will be notified of any changes.

Important Notes about your assessments

In accordance with Curtin policy, you are advised that this unit is a **significant unit** in which failure twice may lead to termination of your course. You are required to attempt **all** components of the assessment. Failure to attempt one, or more, components of the assessment, where there is no valid reason for the lack of an attempt, may result in a 'Failed-Incomplete' (F-IN) grade being allocated at the end of semester regardless of the total mark achieved.

Extensions

Extensions of time for taking any of the required assessments are not usually possible. If there are any extenuating circumstances (such as a medical emergency) then alternative arrangements may be made on a case-by-case basis. However, evidence must be provided such as a dated, and signed, medical certificate (refer to Deferred Assessment below).

Late Submissions

Any allowed late submission will result in a decrease in marks of at least 10% of the assessment mark for each day overdue. For example, if an assessment is worth 20% of your total semester mark then the penalty for two days overdue would be:
 $2 \times (10/100 \times 20\%) = 4\%$. Thus, the total mark available for the assessment would be: $20 - 4 = 16\%$. This does not mean you would receive 16% because it would depend upon the quality of your submission according to the marking criteria.

Supplementary Assessments

If you fail the unit then you may be offered a supplementary assessment. Supplementary assessments are awarded only at the discretion of the Board of Examiners. They are not an automatic right and the Board of examiners will carefully review each individual case. The aim of a supplementary assessment is to allow the student a chance to correct minor problems or deficiencies in the initial assessment and not to gain extra study time or correct major problems. The number of supplementary assessments awarded for each student will be kept to a minimum for a study period and a particular course of study.

Supplementary assessments, if awarded, will be indicated on the official Curtin examination result statement posted to all students, and will also be listed on the School notice board about 24 hours after the Board of Examiners meeting. It is your responsibility to check your status. A student who does not take a scheduled supplementary assessment has no claim to a further assessment. If you are awarded a supplementary assessment it is imperative that you confirm the type, and schedule, of the assessment. Assessments may be in any appropriate format including: multiple choice questions, short answer, essay, or project. The unit coordinator will determine the type of assessment after consulting with lecturers and the Board of Examiners.

Deferred Assessment

Deferment of an assessment is not automatic. Students may be permitted by the relevant Board of Examiners to defer an assessment for circumstances outside of the student's control. However, a student's overall performance may be taken into account in granting permission to defer an assessment. Applications for deferment on health

grounds or as a result of extenuating circumstances must be submitted not later than seven (7) days after the end of the relevant assessment was due to be submitted during the semester. Detailed medical certificates should be attached to the application where appropriate.

Assessment Details

Mid Semester Exam

The mid semester exam is an online supervised exam comprised of up to 100 questions and is worth 30% of your total semester mark. These questions will be mostly multiple choice but other types of questions (such as short answer) may also be used. Some questions will also involve calculations using an approved scientific calculator. This exam covers the topics of Biochemistry 233 that are shown on the schedule during the first six weeks of semester. If any of the topics were moved or altered during the semester then the exam will reflect such changes. This exam will be conducted in the Assessment Centre (105:510) on Level 5 of the Robertson Library (Building 105) and will be open from 8am to 6pm (last test time is 5pm) on weekdays (Monday to Friday). You have one attempt at this exam. You should note the following advice from the Assessment Centre:

“Please be advised the Assessment Centre booking system gives students some flexibility to book a test at a time that is suitable, however there is no guarantee that your preferred time will be available. It is your responsibility to make a booking and to ensure that you have completed the test within the specified availability period. You must secure a booking PRIOR to the first date that the test is available. You are strongly advised to make your bookings early in the semester and to make a booking for each of the tests listed for this unit.

To make your bookings click on the link in the My Studies tab in OASIS.

If you do not plan to use one of your bookings please delete the booking so that it can be made available to another student. Bookings can be changed or deleted online up to 10 minutes before the start time. If you do not attend at the scheduled time your booking will be blocked and you will not be able to make another booking until the block has been removed by the Assessment Centre Team.”

Please note there will be NO extensions, or deferments, of this exam. The only exceptions are medical or other extenuating circumstances (refer to the section on ‘Deferred Assessments’ above).

End of Semester Exam

The end of semester exam is a supervised exam comprised of up to 100 questions and is worth 30% of your total semester mark. These questions will be mostly multiple choice but other types of questions (such as short answer) may also be used. Some questions will also involve calculations using an approved scientific calculator. This exam covers the topics of Biochemistry 233 that are shown on the schedule from weeks 8 to 13, but knowledge of previous topics in Biochemistry 233 will be assumed. There may also be a

few questions in this exam that cover topics shown on the schedule during the first six weeks of semester. If any of the topics were moved or altered during the semester then the exam will reflect such changes. Details of the type (online or paper), location, date, and time of the exam will be given later in semester. You have one attempt at this exam.

Please note that this exam will NOT be a centrally scheduled exam, so it will not appear in your Oasis account at the end of semester. This exam is a school-based exam and a venue, date, and time for the exam will be advised near the end of semester. There will be NO extensions, or deferments, of this exam. The only exceptions are medical or other extenuating circumstances (refer to the section on 'Deferred Assessments' above).

Important points to note about both the mid semester and end of semester exams:

- No collaboration, books, or notes are allowed during the exam either in printed or electronic form unless otherwise stated.
- If the exam is conducted online then only the exam web site is to be open during the assessment. No other computer programs or Internet sites should be open during the online exam. The only exception is the computer calculator or an application needed for the exam and approved by the lecturer.
- Only simple, non-programmable, scientific calculators are allowed during the exam
- Mobile phones should be turned off and not used for any reason during the exam.

If a student is found to contravene any of these points then it may result in the student receiving zero marks for this exam.

Laboratory Activities Assessment

The laboratory activities are an important part of your learning. Scientists take the time to carefully record all of their experimental work. This helps them organize their work, communicate their results to other people, and provide evidence for any potential patent application or intellectual property position. You are learning to be a scientist, so you must take this issue seriously. Consequently, you will be assessed on your contribution during the practical sessions. In particular you will be assessed on your 'Record of Completed Activities' and your Laboratory Book *throughout* semester. Consequently, your laboratory notebook always needs to be up to date. You do NOT need to submit your completed laboratory notebook at the end of semester. Please refer to the 'Information on Biochemistry 233 Laboratory' document on Blackboard for more details on how your laboratory contribution is assessed.

PeerWise Assignment

PeerWise is a specialized web-based system that is unique, and innovative, way to learn biochemistry and develop your thinking skills. It is said that you 'learn by teaching' and that is exactly what you will do with this assignment. You will research, design, and write your own multiple choice questions (MCQ). You will use the web-based system to write your question, the distractors (incorrect answers), the correct answer and feedback. Your questions will then be subject to review by your peers. You will also review other student's questions using PeerWise.

You will write at least 4 MCQs according to the requirements and peer review 8 other questions written by other students. Points will be awarded based upon your contributions and the assessment of your questions by your peers. More details of the PeerWise assignment will be provided in a separate document on Blackboard.

Concept Surveys

Concept surveys are a new, alternative, and important 'tool' that you and your lecturers' can use to determine if learning has been achieved in biochemistry. Your participation in the Concept Surveys is optional and achieves the following:

- provides you with an insight into biochemical concepts
- provides you with feedback of your learning (other than the formal assessments) in biochemistry during semester
- provides the lecturers and unit coordinator with insight on the types of things that students may not understand, are confused, or unclear about in biochemistry.

You should note the following about concept surveys:

- There are two concept surveys: one during the first week of semester and the other during the last week of semester. Both of these surveys are conducted in the Computer Lab (308:104) and are scheduled at the usual practical times (please see the schedule). The concept survey at the end of semester is the same as the concept survey at the beginning of semester.
- Concept surveys consist of up to 100 multiple-choice questions covering a range of concepts that are believed to be important in biochemistry.
- Your answers to the questions in the concept surveys will NOT count towards your final semester grade. Only your conscientious participation in the surveys will be rewarded with a mark
- You will not be given the answers to the questions in the concept surveys because they will be used with future students of biochemistry and it is important that the answers are not released to students.
- You will not receive a final mark for your answers to the surveys, but you may receive some indication on your learning progress as measured by the surveys.
- Participation in Concept Surveys is optional and subject to your consent. Consent will be sought at the beginning of each Survey.
- If you chose not to participate in the concept surveys then the mark for the survey will be added to the mark for the laboratory activities. This will then become a graded mark. That is, you may not achieve the full '5%', because it would depend upon your performance in the laboratory activities.

Questions for Learning

'Questions for Learning' are multiple choice, calculation, and short answer questions, that are designed to help you learn biochemistry as you progress through semester. In particular these questions help you:

- review your knowledge of biochemistry as you progress through the semester
- determine 'what you need to know' for biochemistry
- determine 'how much you need to know' for biochemistry
- determine 'what detail you need to know' for biochemistry
- receive immediate FEEDBACK
- determine how much you have learned
- guide you in your study of the subject (e.g. where you may need to do more study)
- achieve the learning objectives for this unit
- practice for the mid semester and end of semester exams

These 'Questions for Learning' can be found online (Blackboard), in lectures, and in practicals (both as class activities and as written questions). You can choose to answer as many online 'Questions for Learning' as you like and repeat them as often as you like. Obviously, the more questions you answer the better your knowledge and the better prepared you will be for your exams – it is up to you!

Please note that all 'Questions for Learning' will be removed from Blackboard about two days before the commencement of the exams. They will be available again shortly after the mid semester exam has closed.

Mobile Phones

As a courtesy to both lecturers and other students, if you have a mobile phone, please ensure that it is turned off, or muted, during lecture and practical sessions. Mobile phones should also be turned off and not be used for any reason during supervised assessments. Students who do not comply with this request may be asked to leave the class.

Cheating and Plagiarism

It may be tempting for some students to take inappropriate 'short cuts', otherwise known as cheating, to complete your assignments or exams in Biochemistry 233. Cheating (which includes plagiarism and collusion) not only defeats the purpose of your education, but also disadvantages your fellow students. Cheating is unfair and will not be tolerated in any assignment, practical, or exam. All assignments and exams are carefully scrutinized and severe penalties will apply to any student found cheating.

It is not acceptable to simply copy the words of other students or authors when completing any assessment or assignment in this unit. This action constitutes plagiarism and is regarded as academic malpractice. Plagiarism will not be tolerated. The penalties for plagiarism can be severe and may include termination from your course of study. All direct quotes must be correctly attributed to the author and should be kept to a

minimum. Also, you should include a list of references to acknowledge the source(s) of information used to produce any written work. Curtin University's policy on academic (student) integrity and plagiarism can be found at:

<http://academicintegrity.curtin.edu.au/studentbook.html>

Collaboration with other students is encouraged, but collusion will not be tolerated. Consequently, you must ensure that any work you submit is your own work and not a result of collusion with one, or more, other students. Please note that electronic checks may be made on any submitted written assignment using specialist software that detects significant similarities and known references.

Student Rights and Responsibilities

You are responsible for your own learning. It is also important for you to read and understand the following statement²: "It is the responsibility of every student to be aware of all relevant legislation and 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; students' communication with students. Further information is available at: www.students.curtin.edu.au/rights/

² Teaching and Learning at Curtin (2009) page 16. Office of Teaching and Learning. Curtin University.

Biochemistry 233 Proposed Study Schedule 2012					
Week	Week Begin	Lecture Monday 9am-10am 401:002	Lecture Wednesday 5pm-6pm 210:102	Practical Monday A: 10am-1pm B:2-5pm Tuesday C: 10am-1pm D:2-5pm 310.103A	Assessment and Assignment Schedule
1	27-Feb	Introduction to Biochemistry	Molecular Forces in Biochemistry	Biochemistry Concept Survey Meet in 310.103A	PeerWise continues all semester
2	5-Mar	Water, pH and buffers	Amino Acids as Building Blocks	Practical 1	
3	12-Mar	Protein Structure	Haemoglobin	Practical 2	
4	19-Mar	Fibrous Proteins: Collagen	Enzymes 1	Practical 3	
5	26-Mar	Enzymes 2	Bioenergetics 1	Practical 4	
6	2-Apr	Bioenergetics 2	Molecular Visualisation	Practical 5	
7	9-Apr	Tuition-free Week	Tuition-free Week	Tuition-free Week	
8	16-Apr	Concepts of Metabolism 1	Concepts of Metabolism 2	Practical 6	Mid-Semester Exam
9	23-Apr	Carbohydrates	Glycolysis	Practical 7	
10	30-Apr	TCA cycle	Pentose Phosphate Pathway	Practical 8	
11	7-May	Electron Transport & Oxidative Phosphorylation	Structure & Function of Lipids	Practical 9	
12	14-May	Energy from Fatty Acids	Energy from Ketone Bodies	Practical 10	
13	21-May	Energy from Amino Acids	TBA	Biochemistry Concept Survey Mac Lab 308:104	
14	28-May	End of Semester Study Week	End of Semester Study Week	End of Semester Study Week	PeerWise Closed end of week
15	4-Jun	Exam Week	Exam Week	End of Semester Exam	End of Semester Exam

TBA = To be announced.