

Course Outline

Code: MLS211

Title: Medical Biochemistry

School of:	Health & Sport Sciences
Teaching Session:	Semester 2
Year:	2020
Course Coordinator:	Dr Mark Holmes Tel: 5430 2844 Email: mholmes@usc.edu.au
Course Moderator:	A/Prof Fraser Russell Tel: 5459 4665 Email: frussell@usc.edu.au

Please go to the USC website for up to date information on the teaching sessions and campuses where this course is usually offered.

1. What is this course about?

1.1 Description

Medical biochemistry is the area of general pathology that performs analyses on human specimens such as blood plasma and serum, urine, cerebrospinal fluid, serous fluids and tissue biopsies. The course describes common tests used to assist with the diagnosis and treatment of human diseases. On completion of this course, you will be able to demonstrate and evaluate current knowledge in the basic principles and practices of the medical biochemistry laboratory, including disorders of amino acid and carbohydrate metabolism, dyslipidaemias, and routine chemistries for major organ system functions.

1.2 Course topics

Basic principles and practices in the medical biochemistry laboratory
Human specimen collection for diagnostic testing in clinical chemistry
Critical correlations and analytical procedures in medical biochemistry
Biochemistry of disorders of carbohydrate, lipid, amino acid and protein metabolism
Common analytes/biomarkers used to assess human organ system functions, including diagnosis of renal, gastrointestinal, cardiac and liver function
Analytical techniques in medical biochemistry, including spectrophotometry, electrophoresis, ion-selective electrodes, blood pH and gas analysis, and immunoassay
Evaluation of analytical data and scientific writing skills
Critical review of scientific literature

2. What level is this course?

200 level Developing - Applying broad and/or deep knowledge and skills to new contexts. May require pre-requisites and introductory level knowledge/skills. Normally undertaken in the 2nd or 3rd year of an undergraduate program

3. What is the unit value of this course?

12 units

4. How does this course contribute to my learning?

Specific Learning Outcomes On successful completion of this course you should be able to:	Assessment Tasks You will be assessed on the learning outcome in task/s:	Graduate Qualities or Professional Standards mapping Completing these tasks successfully will contribute to you becoming:
Critically analyse and evaluate concepts in medical biochemistry that are relevant to the pathology services industry.	Task 2. Review quiz Task 3. End-of-semester exam	Creative and critical thinkers.
Capably and confidently demonstrate skills and competencies in medical biochemistry required to enter the pathology services industry.	Task 1. Competency-based practical portfolio	Empowered.
Communicate scientifically in the form of individual reports.	Task 1. Competency-based practical portfolio	Empowered
Demonstrate current knowledge of the medical biochemistry discipline of laboratory medicine	Task 2. Review quiz Task 3. End-of-semester exam	Knowledgeable

5. Am I eligible to enrol in this course?

Refer to the [USC Glossary of terms](#) for definitions of “pre-requisites, co-requisites and anti-requisites”.

5.1 Enrolment restrictions

Nil

5.2 Pre-requisites

LFS251 Biochemistry

5.3 Co-requisites

Nil

5.4 Anti-requisites

Nil

5.5 Specific assumed prior knowledge and skills (where applicable)

It is recommended that students have prior knowledge and skills in chemistry, biochemistry and human physiology.

6. How am I going to be assessed?

6.1 Grading scale

Standard – High Distinction (HD), Distinction (DN), Credit (CR), Pass (PS), Fail (FL)

6.2 Details of early feedback on progress

In week 2, you will submit a formative assessment (Task 1a) based on Practical 1 that will involve you completing exercises associated with basic laboratory competencies in biochemistry. The formative feedback provided on this assessment will give you confidence in undertaking the remaining practical classes in the MLS211 course.

6.3 Assessment tasks

Task No.	Assessment Tasks	Individual or Group	Weighting %	What is the duration / length?	When should I submit?	Where should I submit it?
1	Competency-based practical portfolio	One formative and four summative practical sub-tasks completed as an individual or pair	50% total	Multiple reports equivalent to approx. 2500 words total	Weeks 2, 4, 7, 10 and 12	Task dependent: see Task Format on the MLS211 Blackboard site Online submission is via SafeAssign
2	Review quiz	Individual	20%	1-hour and 30 minutes	Week 6	Online
3	End-of-semester exam	Individual	30%	2-hours and 30 minutes	Central Examination Period	Online
			100%			

Assessment Task 1: Competency-Based Practical Portfolio (50%)

Goal:	In this assessment task, you will demonstrate your developing competencies in practical medical biochemistry and analyse and evaluate your laboratory competencies achieved by communicating in the format of practical reports.										
Product:	Practical reports.										
Format:	<p>The competency-based practical portfolio will include:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">Task 1a. Practical 1 basic lab competencies report:</td> <td>Not graded - Individual or Pair - Week 2</td> </tr> <tr> <td>Task 1b. Practical 2 glucose tolerance testing report:</td> <td>10% - Individual or Pair - Week 4</td> </tr> <tr> <td>Task 1c. Practical 3 serum lipid profile report:</td> <td>20% - Individual or Pair - Week 7</td> </tr> <tr> <td>Task 1d. Practical 4 serum cardiac troponin I report:</td> <td>10% - Individual or Pair - Week 10</td> </tr> <tr> <td>Task 1e. Practical 5 liver function tests report:</td> <td>10% - Individual or Pair - Week 12</td> </tr> </table> <p>Please refer to the MLS211 Assessment folder in Blackboard for specific details for task description, format and submission instructions.</p>	Task 1a. Practical 1 basic lab competencies report:	Not graded - Individual or Pair - Week 2	Task 1b. Practical 2 glucose tolerance testing report:	10% - Individual or Pair - Week 4	Task 1c. Practical 3 serum lipid profile report:	20% - Individual or Pair - Week 7	Task 1d. Practical 4 serum cardiac troponin I report:	10% - Individual or Pair - Week 10	Task 1e. Practical 5 liver function tests report:	10% - Individual or Pair - Week 12
Task 1a. Practical 1 basic lab competencies report:	Not graded - Individual or Pair - Week 2										
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Task 1c. Practical 3 serum lipid profile report:	20% - Individual or Pair - Week 7										
Task 1d. Practical 4 serum cardiac troponin I report:	10% - Individual or Pair - Week 10										
Task 1e. Practical 5 liver function tests report:	10% - Individual or Pair - Week 12										
Criteria:	<p>For Task 1a, you will complete a set of exercises on a report sheet provided by the course coordinator that are based on an online simulation of basic laboratory competencies in biochemistry (Practical 1). You will be expected to complete the Practical 1 report either individually or as a pair of students, and submit your answers via SafeAssign on Blackboard. Task 1a is a formative exercise that must be completed by all students.</p> <p>For Tasks 1b, 1c, 1d and 1e, you will submit a practical report based on the experimental work undertaken in Practicals 2, 3, 4 and 5. Specific details about the report structure for Tasks 1b, 1c, 1d and 1e will be provided in the MLS211 Assessment folder in Blackboard. You may submit your practical reports individually or as a pair of students. You will be assessed on your ability to:</p> <ul style="list-style-type: none"> • adhere to the correct format and presentation (e.g. structure, spelling, grammar, referencing, written expression) for a practical report; • interpret and analyse the findings obtained during the practicals; • relate the practical findings to peer-reviewed articles (NOT internet sites) in the medical biochemistry literature, and to reference your report correctly. 										

Assessment Task 2: Review Quiz (20%)

Goal:	In this assessment task, you will be able to demonstrate, apply and evaluate your theoretical and practical knowledge associated with human specimen collection; principles and practice in the medical biochemistry discipline of the pathology laboratory; and disorders of carbohydrate and lipid metabolism (metabolic syndrome).
Product:	You will need to complete an online review quiz in week 6 of semester.
Format:	The review quiz will consist of 50 multiple-choice questions and will be based on the material covered in the online lecture modules, tutorials and practicals held during weeks 1 to 5 of semester.
Criteria:	You will be assessed on your ability to: <ul style="list-style-type: none"> • demonstrate and apply knowledge of the principles and concepts of medical biochemistry; • analyse information and explain important elements of the theories which underpin the concepts in medical biochemistry covered during the course; • use evidence-based reasoning to provide correct answers to the multiple choice questions.

Assessment Task 3: End-of-Semester Exam (30%)

Goal:	In this assessment task, you will be able to demonstrate, apply and evaluate your theoretical and practical knowledge associated with disorders of amino acid and protein metabolism; biochemistry of enzymes used in clinical diagnosis; assessment of renal, cardiac, gastrointestinal, and liver function; body water and electrolyte homeostasis; and blood gases, pH and buffers.
Product:	You will need to complete an online exam during the central examination period.
Format:	The exam will consist of 75 multiple-choice questions and will be based on the material covered in the online lecture modules, tutorials and practicals held during weeks 6 to 13 of the semester.
Criteria:	You will be assessed on your ability to: <ul style="list-style-type: none"> • demonstrate and apply knowledge of the principles and concepts of medical biochemistry; • analyse information and explain essential elements of the theories which underpin the concepts in medical biochemistry covered during the course; • solve problems based on theoretical material and information covered in online lecture modules, tutorials and practicals; • use evidence-based reasoning to provide correct answers to the multiple-choice.

7. Directed study hours

The directed study hours listed here are a portion of the workload for this course. A 12-unit course will have total of 150 learning hours which will include directed study hours (including online if required), self-directed learning and completion of assessable tasks. Directed study hours may vary by location. Student workload is calculated at 12.5 learning hours per one unit.

This course will be delivered via technology-enabled learning and teaching. All lectures will remain in this mode for Semester 2 2020. When government guidelines allow, students that elected on-campus study via the class selection process will be advised via Blackboard if/when on-campus sessions can resume.

Location:	Directed study hours for location:
USC Sunshine Coast	Pre-recorded online lecture modules each week Tutorials (2-hours per week, commencing in week 1) Practicals (3-hours each fortnight, commencing in week 1)

8. What resources do I need to undertake this course?

Please note that course information, including specific information of recommended readings, learning activities, resources, weekly readings, etc. are available on the course Blackboard site. Please log in as soon as possible.

8.1 Prescribed text(s)

Please note that you need to have regular access to the resource(s) listed below as they are required:

Author	Year	Title	Publisher
RL Sunheimer & L Graves	2018	Clinical Laboratory Chemistry (2 nd edn)	Pearson Education, USA

8.2 Specific requirements

A MLS211 Practical Manual will be available for purchasing from USC Mail and Print Services (MaPS). MLS211 is structured to provide you with knowledge and practical skills necessary to meet industry established proficiency standards. It is therefore an expectation of both the University and our industry partners that you will participate in all the directed study activities (online lecture modules, laboratory practicals, tutorials) and demonstrate satisfactory proficiency in the practical assessment. To gain such proficiency you must participate in at least 80% of the laboratory practicals throughout the semester. You are required to provide and wear appropriate personal protective equipment during the laboratory practicals, including covered, non-slip shoes, laboratory coat/gown and safety glasses. Disposable gloves and other protective equipment will be provided when required.

9. Risk management

Risk assessments have been performed for all laboratory classes and a moderate level of health and safety risk exists. Moderate risks are those associated with laboratory work such as working with chemicals and hazardous substances. You will be required to undertake laboratory induction training and it is also your responsibility to research and understand the risks associated with your specific course of study and to familiarise yourself with the University's general health and safety principles by reviewing the online induction training for students.

It is your responsibility as a student to review course material, search online, discuss with lecturers and peers, and understand the health and safety risks associated with your specific course of study. It is also your responsibility to familiarise yourself with the University's general health and safety principles by reviewing the [online Health Safety and Wellbeing training module for students](#), and following the instructions of the University staff.

10. What administrative information is relevant to this course?

10.1 Assessment: Academic Integrity

Academic integrity is the ethical standard of university participation. It ensures that students graduate as a result of proving they are competent in their discipline. This is integral in maintaining the value of academic qualifications. Each industry has expectations and standards of the skills and knowledge within that discipline and these are reflected in assessment.

Academic integrity means that you do not engage in any activity that is considered to be academic fraud; including plagiarism, collusion or outsourcing any part of any assessment item to any other person. You are expected to be honest and ethical by completing all work yourself and indicating in your work which ideas and information were developed by you and which were taken from others. You cannot provide your assessment work to others. You are also expected to provide evidence of wide and critical reading, usually by using appropriate academic references.

In order to minimise incidents of academic fraud, this course may require that some of its assessment tasks, when submitted to Blackboard, are electronically checked through SafeAssign. This software allows for text comparisons to be made between your submitted assessment item and all other work that SafeAssign has access to.

10.2 Assessment: Additional requirements

Eligibility for Supplementary Assessment

Your eligibility for supplementary assessment in a course is dependent of the following conditions applying:

- a) The final mark is in the percentage range 47% to 49.4%
- b) The course is graded using the Standard Grading scale
- c) You have not failed an assessment task in the course due to academic misconduct

10.3 Assessment: Submission penalties

Late submission of assessment tasks will be penalised at the following maximum rate:

- 5% (of the assessment task's identified value) per day for the first two days from the date identified as the due date for the assessment task.
- 10% (of the assessment task's identified value) for the third day
- 20% (of the assessment task's identified value) for the fourth day and subsequent days up to and including seven days from the date identified as the due date for the assessment task.
- A result of zero is awarded for an assessment task submitted after seven days from the date identified as the due date for the assessment task.

Weekdays and weekends are included in the calculation of days late.

To request an extension, you must contact your Course Coordinator and supply the required documentation to negotiate an outcome.

10.4 Study help

In the first instance, you should contact your tutor, then the Course Coordinator. Additional assistance is provided to all students through Academic Skills Advisers. To book an appointment or find a drop-in session go to [Student Hub](#).

Contact Student Central for further assistance: +61 7 5430 2890 or studentcentral@usc.edu.au

10.5 Wellbeing Services

Student Wellbeing Support Staff are available to assist on a wide range of personal, academic, social and psychological matters to foster positive mental health and wellbeing for your success. Student Wellbeing is comprised of professionally qualified staff in counselling, health and disability Services.

Ability Advisers ensure equal access to all aspects of university life. If your studies are affected by a disability, mental health issue, learning disorder, injury or illness, or you are a primary carer for someone with a disability, [AccessAbility Services](#) can provide assistance, advocacy and reasonable academic adjustments.

To book an appointment with either service go to [Student Hub](#), email studentwellbeing@usc.edu.au or accessability@usc.edu.au or call 07 5430 1226

10.6 Links to relevant University policy and procedures

For more information on Academic Learning & Teaching categories including:

- Assessment: Courses and Coursework Programs
- Review of Assessment and Final Grades
- Supplementary Assessment
- Administration of Central Examinations
- Deferred Examinations
- Student Academic Misconduct
- Students with a Disability

Visit the USC website:

<http://www.usc.edu.au/explore/policies-and-procedures#academic-learning-and-teaching>

10.7 General Enquiries

In person:

- **USC Sunshine Coast** - Student Central, Ground Floor, Building C, 90 Sippy Downs Drive, Sippy Downs
- **USC Moreton Bay** – Service Centre, Ground Floor, Foundation Building, Gympie Road, Petrie
- **USC SouthBank** - Student Central, Building A4 (SW1), 52 Merivale Street, South Brisbane
- **USC Gympie** - Student Central, 71 Cartwright Road, Gympie
- **USC Fraser Coast** - Student Central, Student Central, Building A, 161 Old Maryborough Rd, Hervey Bay
- **USC Caboolture** - Student Central, Level 1 Building J, Cnr Manley and Tallon Street, Caboolture

Tel: +61 7 5430 2890

Email: studentcentral@usc.edu.au