UNIT OUTLINE
Semester 1, 2012

Unit Details
Unit Index No: 311421
Credit Points: 25 credit points upon successful completion of this unit
Pre-requisite Units: Biomedical Science 100, Medical Laboratory Science 132, Human Biology 134 or any other new or previous version
Unit Coordinator: Associate Professor Trilochan [TK] Mukkur
Address
School of Biomedical Sciences
Curtin University of Technology
GPO Box U1987
PERTH WA 6845
Email: T.Mukkur@curtin.edu.au
Phone: (08) 9266.7520
Fax: (08) 9266.2342

Method of Assessment
To pass this unit you must complete the assessment tasks listed below.

<table>
<thead>
<tr>
<th>Assessment Tasks</th>
<th>Applies to</th>
<th>Due Date</th>
<th>Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Test</td>
<td>Theory</td>
<td>TBA</td>
<td>15%</td>
</tr>
<tr>
<td>Final Theory Examination</td>
<td>Lectures</td>
<td>TBA</td>
<td>45%</td>
</tr>
<tr>
<td>Laboratory Notebook Record Keeping</td>
<td>Practical</td>
<td>TBA</td>
<td>10%</td>
</tr>
<tr>
<td>Practicum Test</td>
<td>Practical</td>
<td>TBA</td>
<td>30%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Detailed information on assessment in this unit can be found in the sections of this plan titled 'Assessment Format' and 'Assessment Details'.
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome</td>
<td>3</td>
</tr>
<tr>
<td>Requirements to Complete the Unit</td>
<td>3</td>
</tr>
<tr>
<td>Prerequisite skills, Laboratory charge, Technology</td>
<td>3</td>
</tr>
<tr>
<td>Aims</td>
<td>4</td>
</tr>
<tr>
<td>Unit Outcomes</td>
<td>4</td>
</tr>
<tr>
<td>Learning outcomes (Content knowledge)</td>
<td>4</td>
</tr>
<tr>
<td>Professional skills outcomes</td>
<td>5</td>
</tr>
<tr>
<td>Syllabus</td>
<td>5</td>
</tr>
<tr>
<td>Unit Materials</td>
<td>7</td>
</tr>
<tr>
<td>Unit outline, Textbook, Reference texts, Practical manual [either printed or on the unit WebCT]</td>
<td>7</td>
</tr>
<tr>
<td>Contact Details</td>
<td>8</td>
</tr>
<tr>
<td>Study Load</td>
<td>8</td>
</tr>
<tr>
<td>Delivery of Unit</td>
<td>9</td>
</tr>
<tr>
<td>Lectures, Practicals</td>
<td>9</td>
</tr>
<tr>
<td>Assessment Format</td>
<td>9</td>
</tr>
<tr>
<td>Assessment Details</td>
<td>10</td>
</tr>
<tr>
<td>Practical component, Midterm Test, Final examination</td>
<td>10</td>
</tr>
<tr>
<td>Mobile Phones</td>
<td>10</td>
</tr>
<tr>
<td>Copyright Requirements</td>
<td>10</td>
</tr>
<tr>
<td>Plagiarism Policy</td>
<td>10</td>
</tr>
<tr>
<td>Supplementary Examinations</td>
<td>11</td>
</tr>
<tr>
<td>Deferred Assessment</td>
<td>11</td>
</tr>
<tr>
<td>Lecture Program</td>
<td>12</td>
</tr>
<tr>
<td>Practical Program</td>
<td>13</td>
</tr>
<tr>
<td>Reminder Note for Students</td>
<td>14</td>
</tr>
</tbody>
</table>

Please read this outline fully before commencing your study in this unit.

Acknowledgement: This document uses a template developed and provided by Ms Dianne Budd and includes text appearing in the original document.
Welcome

Welcome to Molecular and Cellular Immunology 231

If you are reading this, you should be enrolled in the unit Molecular and Cellular Immunology 231 [MCI 231] which is a prescribed unit for the course leading to the Degree of Bachelor of Science (Molecular Genetics & Biotechnology).

Alternatively, you may be undertaking MCI 234 as an additional unit (or an elective) if you are enrolled in the Bachelor of Science (Multidisciplinary Science), Bachelor of Science (Human Biology) or some other Bachelor Degree at Curtin. The unit may also be recognized as an approved unit to be credited towards a degree offered by another university.

If none of the above apply to you, check with the unit coordinator whether you should be enrolled in this unit.

Broadly speaking, MCI 231 focuses upon the structure and functions of the immune system, innate and adaptive immunity and their inter-relationships in health and disease. The intricate and tight inter-relationship between immunology and molecular biology will become evident in this unit. We also discover how some immunological methods are used and applied in a wide variety of scientific fields notably eukaryotic molecular biology, molecular microbiology, orthodox and complimentary medicine, medical and veterinary infectious disease microbiology, medical biochemistry, exercise physiology, neuroscience, forensic science, and important aspects of drug discovery leading to a vast array of career options. It is my role to assist you in discovering immunobiology as a comparatively young discipline of science and finding the unit enjoyable, challenging and rewarding in terms of the time and effort you invest in it.

Please read this document carefully. It explains everything you need to know about MCI 231 and how it will operate.

Please do not hesitate to contact me at any stage if you have any questions, queries or comments on the unit.

Associate Professor Trilochan [TK] Mukkur
Unit Coordinator
Molecular and Cellular Immunology 231

Requirements to Complete the Unit

Prerequisite skills
The content covered in Molecular and Cellular Immunology 231 assumes that you have successfully completed Biomedical Science 100, Medical Science 132 or Human Biology 134 or any other previous version and:

1. are familiar with structure and function of the body
2. understand the multidisciplinary nature of Molecular Genetics and Biotechnology and its significance in other scientific fields
3. are competent in English, mathematics and chemistry
4. have reasonable written and verbal communication skills
5. can effectively source, access and use library resources (printed and electronic).
Laboratory charge
No charges or levies are applied to students in this unit for their use of the laboratory. However, you will not need to purchase a copy of the MCI 231 Laboratory Manual because you will be able to obtain a copy of the exercises from the unit web site.

Technology
It is helpful, but not essential, that you have access to:

- a computer with an Internet connection, which you can use effectively
- email (preferred), a telephone or a fax machine to contact your tutor and other students studying the same unit.

You can access the computing facilities on campus if you do not have access to a computer at home.

Aims
The unit MCI 231 is designed to develop your understanding of the physiology of the immune system, genetic basis of its development and its role in health and disease. Another aim of this unit is to impart you with basic technical skills acquired in performing selected immunological procedures, that may be relevant to your chosen career option. Overall, you will develop an understanding of the roles of immunology and immunological techniques in different fields of biomedical sciences particularly molecular biological, proteomic and medical laboratory sciences.

MCI 231 seeks to build on the foundations provided by Biomedical Science 100, Medical Laboratory Science unit 132 and improve your abilities to retrieve, analyse and evaluate relevant information, enhance your problem solving and decision making skills and provide additional opportunities to work as part of a team. These skills need to be combined with good written and verbal communication abilities and effective interpersonal skills. Scientists with these skills are valued employees in laboratories and are sought after by employers.

Unit Outcomes

Learning outcomes (Content knowledge)
This unit is designed to introduce you to both theoretical and practical aspects of immunology. On successful completion of this unit you will be able to:

- describe the structure and functions of the organs of the immune system in the induction of immune responses to foreign invaders and define the roles of the immune system in normal individuals
- demonstrate comprehension of the processes involved in the induction and expression of immune responses
- Explain the structure and function of antibodies, concepts underpinning monoclonal antibody technology, and the genetic basis of antibody and T cell receptor diversity
- demonstrate comprehension of the concepts underpinning generation of systemic versus mucosal immune responses and their relevance in the development of vaccines against foreign invaders
- demonstrate an understanding of the concepts underpinning the aetiology of immune dysfunction
- demonstrate basic laboratory skills relevant to selected immunologically based methods as used in research in biomedical sciences, clinical immunology, clinical biochemistry, forensic science, cancer biology and drug discovery.
Professional skills outcomes
On successful completion of this unit you will have completed tasks that will have developed the following skills:

**Effective communication**
Communicating with your lecturer and other students enrolled in Immunobiology 234
Use of written, verbal and electronic media

**Analysis and evaluation of information**
Accessing, analysing and critically evaluating relevant information
Completing self-study and practical exercises (in partnership)

**Problem solving and decision making**
Setting aside time to study, research and review topic items
Reviewing lecture materials
Submitting answers to the questionnaires
Completion of assessments

**Teamwork**
Completing practical exercises in partnership with other student(s)
Revision and discussion of topic items

**Practical competence**
"Hands-on" experiments in practical sessions
Completion of practical exercises competently and safely

**Record Keeping of practicum data**
"Keeping accurate records of the practical results and interpretation

**Awareness of issues affecting health professionals**
Development of high ethical standards
Knowledge of the inter-relationship between science disciplines and their interrelationships

Syllabus
The unit MCI 231 comprises nine [9] topics in immunology that are central to the appreciation of, and relevance to different career options particularly for students majoring in molecular biotechnology and biomedical sciences getting them “JOB READY”, through confidence gained in the unit, in the synthesis and application of immunobiological concepts and hands-on practical experience in problem-solving.

The topics are:

01 Structure and functions of the immune system
02 Lymphocyte physiology and their cell membrane antigen systems
03 Immunogens and characteristics; Antibody structure and function; Genetic basis of antibody diversity; principles and applications of monoclonal antibody technology.
04 Antigen-antibody reactions and immunoassays
05 The MHC Complex and its role
06 Cytokines in health and disease
07 The complement system
08 Immunopathology – Hypersensitivities: Causes and health consequences
09 Immune response to preventable infectious diseases and currently used vaccines, Immunotherapy concepts and applications

Syllabus - summary

1. Structure and functions of the immune system
   An overview of the immune system. Innate immunity and adaptive immune response - cellular and humoral responses. Clonal selection theory - Introduction to the clonal selection theory; characteristics of the immune response - specificity, memory, amplification, modulation; Components of the immune system - organs, cells and products; Primary and secondary lymphoid organs, the scope of immunology & its relevance and applications; Anaphylaxis vs prophylaxis & principles underpinning immunization practices; kinetics of the immune response and future of immunobiology.

2. Lymphocyte physiology and their cell membrane antigen systems
   Lymphocytes - classes, subclasses and identification - cell receptors and markers for detection and enumeration; T and B cells – cooperation; Lymphocyte recirculation concept and introduction to cytokines; The consequences of contact with antigen - normal vs immune individuals.

3. Immunogens and characteristics, Antibody structure and function, and principles and applications of monoclonal antibodies
   Definitions, sources and nature of antigens; Requirements for immunogenicity; Antigenic determinants, epitopes and antigen valency. Natural and synthetic antigens - comparisons, examples, uses; Thymus dependent vs thymus independent antigens - comparisons, examples uses; The fate of injected antigen - organ localisation, and catabolism. Structure of different isotypes of antibodies, comparative functions of different types of antibody isotypes, concept of mucosal immunity, Functions of antibodies- antigen and antibody specificity, complement binding sites and placental transfer; Relationships between Igs - isotypes, allotypes and idiotypes; Antibody heterogeneity and diversity. Pathological Igs - myeloma proteins, sources, nature and detection; Antibody manipulations; The preparation and characterisation of monoclonal antibodies; Selected uses of monoclonal antibodies - identification of cells via CD markers, diagnostic vs therapeutic uses of MAbs; Engineered humanised antibodies and uses.

4. Antigen-antibody reactions and immunoassays
   Mechanisms of antigen-antibody reactions - In vivo vs in vitro reactions; Antibody specificity and cross reactivity; Specific vs non-specific Igs.; Antigen binding - measurement, antibody affinity versus avidity; The precipitin reaction (liquid vs gels) - quantitative aspects, advantages and disadvantages; Examples and applications; Labelled antibodies and their uses. Anti-antibody reagents - production and uses; Antibody- and cell-based Immunoassays - homogeneous vs heterogeneous. Radioimmunoassays [in brief]. Enzyme linked immunosorbent assays (ELISA), principles underpinning affinity chromatography, Western electro- and dot blotting for detection of antibody or antigens; Introduction to fluorescence activated cell sorting [theory]

5. The MHC Complex and its role
   Historical aspects; The MHC gene complex and its products; Major Histocompatibility antigens - structure of Class 1 and Class II antigens and their biological significance in role in antigen processing and presentation, and graft rejection disease associations.
6. The complement system
The complement system - components and nomenclature; Properties and functions - complement mediated cytolysis; Complement activation – recognition, activation and membrane attack; Complement assays - functional vs component assays - complement fixation test and functional assays such as the bactericidal assay.

7. Cytokines in health and disease
History and general properties of cytokines, Functions categories of cytokines, cytokine receptors and signal transduction, Role of cytokines and cytokine receptors in disease, therapeutic and diagnostic application of cytokines.

8. Immunopathology – Hypersensitivity and health consequences
Classification of hypersensitivities - Types 1 II, III and IV; Mechanisms and consequences of hypersensitivities – immunopathology; mechanisms underpinning Immunological tolerance; Autoimmune responses and their consequences - selected examples; immunodeficiency syndromes and carcinomas

9. Immune response to preventable infectious diseases and currently used vaccines
Systemic and mucosal immune responses upon encountering infectious disease agents with different anatomical site preferences and the currently available vaccines for their prevention; Basic mechanisms of protection against extracellular vs intracellular pathogens of bacterial, viral and parasitic origins. Recent approaches to the design of vaccines with emphasis on the mucosally-acquired diseases; Immunotherapy concepts and applications

Unit Materials

Unit syllabus summary
To be handed out in the first lecture session.

Unit syllabus detailed outline
The unit outline (this document) gives you important information about the general aims of the unit, texts and references, and details about the assessment, including allocation of marks, grading criteria and submission dates. You should make this unit outline the first document that you read for the unit. Study it carefully, paying particular attention to assessment instructions and submission dates.

Textbook
The text for this unit is:


This textbook is seriously supplemented with material from the recommended textbooks and recent papers published in high impact relevant journals.

Reference texts
A selection of immunology texts may be placed in the Closed Reserve section of the library for reference use. Students are encouraged to become familiar with these texts initially by scanning the contents and then concentrating on the relevant and desired/sought-after information.

Web-based resources
The Unit Coordinator maintains a Web site for use by the enrolled students. You will be informed about specifics of the site in the class. It is anticipated that lecture materials and other items will be available through this site. If for some reason, these are not available through this site, you will be handed notes during the lecture period.

You may also find some of the information available through the School of Biomedical Sciences Home Page useful. From there, you can find out about the School of Biomedical Sciences, its courses and its staff. You may find the link to other Web sites particularly useful. The URL for the School of Biomedical Sciences Home Page at Curtin is: http://wbiomed.curtin.edu.au/

Contact Details
The unit coordinator for Molecular and Cellular Immunology 231 is Associate Professor T K S Mukkur in the School of Biomedical Sciences at Curtin. During the semester you may need to contact Dr Mukkur for various reasons. He can be contacted in person or via email, phone or fax.

Office 308.208
Email: T.Mukkur@curtin.edu.au
Phone (08) 9266 7520 (office)
Fax (08) 9266 2342

Dr Mukkur’s office phone is connected to a Voice Answering system which will prompt you to leave a message if he is unable to take your call. If you do so, please state your name, why you are calling, a contact number and suggested time to ring. The machine will record the time you rang. Please be reasonable and don’t expect a call back after hours or on weekends, or for Dr Mukkur to keep ringing if there is nobody home to take the call.

Here’s an example of a good message:
"Hi, my name is _____ _______ and I'm in your MC 231 class. I need to speak to you about _________________. My number is ______________ and I will be home from _____ to______.

Study Load

You will need to spend about 6 hours a week outside of scheduled classes writing answers to the questions relating to the practical sessions and studying in this unit to be successful. It is important that you keep up with program as it is very difficult to catch up on lost or wasted time. You may need more time per week if you haven't acquired a strong background after undertaking Biomedical Science 100, Medical Laboratory Science 132 and/or if you have not studied in the field of biomedical sciences before.

Remember that the Unit Coordinator is there as a resource to assist you in your studies.

Delivery of Unit

Tuition pattern

Five (5) hours per week allocated as follows:
- Lecture 2 x 1 hour
- Practical 1 x 2 hours
  1 x 1 hour [follow up session]

Lectures

Attendance at all lectures is strongly recommended.

Practicals

Attendance at practical sessions is compulsory. A laboratory coat (supplied by the School) must be worn in all laboratory sessions and left in the laboratory on completion of the session. Required safety regulations must be observed at all times (refer separate Safety Manual).

Teamwork in practical sessions

Groups [2-3 students/Group] will be formed by signing up for the appropriate laboratory session. Those students who have not managed to form groups will be assigned to the groups by the lecturer in-charge of the unit. It is important to keep accurate records of the experimental data obtained. Students within the groups must share results with each other.

IMPORTANT NOTE

During this semester you may be working with pooled specimens from hospital patients or pooled student serum or your own serum samples and reagents prepared from blood, blood products of body fluids. These materials may be capable of transmitting disease, particularly hepatitis and AIDS. For this reason, all specimens and reagents must be handled is if they were infectious. It is assumed that you were vaccinated against Hepatitis B and Mantoux tested recently. You will need to fill in your vaccination history against tetanus (in the first week when no actual practical session is planned to be carried out since some of the practical exercises will involve the use of tetanus toxoid as an antigen.

Method of Assessment

To pass this unit you must complete the assessment tasks listed below.
### Assessment Tasks

<table>
<thead>
<tr>
<th>Assessment Tasks</th>
<th>Applies to</th>
<th>Due Date</th>
<th>Worth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm Test</td>
<td>Theory</td>
<td>TBA</td>
<td>15%</td>
</tr>
<tr>
<td>Final Theory Examination</td>
<td>Lectures</td>
<td>TBA</td>
<td>45%</td>
</tr>
<tr>
<td>Laboratory Notebook Record Keeping</td>
<td>Practical</td>
<td>TBA</td>
<td>10%</td>
</tr>
<tr>
<td>Practicum Test</td>
<td>Practical</td>
<td>TBA</td>
<td>30%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Students are expected to achieve a pass standard in each of the above-mentioned assessments to complete Molecular and Cellular Immunology 231 unit. Note that a mark of 50% or more in both the theoretical and practical components of the unit is required in order to secure a pass. Failure in any one area may result in an overall failure in this unit regardless of the total marks accrued. That is, a pass in the practical component but failure in the theory component (or vice versa) may lead to a fail grade for the unit, even though the student's total mark may exceed 50%. Students whose performance in any assessment is unsatisfactory may fail the entire unit or be required to complete additional assessment(s) to a satisfactory standard.

In accordance with Curtin policy, students are advised that this unit is a **SIGNIFICANT UNIT** in which failure twice may lead to termination of a student's course.

### Assessment Details

**Practical component**

It is compulsory to attend a minimum of 80 percent of the laboratory practical sessions in this unit. Students who miss any session for any reason will still be responsible knowing the concepts underpinning the technique covered in the missed laboratory session. All students must keep accurate practicum records including recording of the missed laboratory sessions.

**Midterm test**

This test will be worth 20% of the total assessment marks for the unit and will cover the chapters covered until the week before.

**Final examination**

The final theory examination will be worth 45% of the total assessment mark for the unit. It will consists of a supervised 2 hour paper to be conducted during the official university examination period. This will be a closed book exam. No notes or books will be allowed into the examination room. The use of a calculator is permitted. Further details regarding the final examinations will be provided later in the semester.

### Examination Formats

- Final examination will cover all the material covered in the unit [Worth 45% (5-10% for lectures covered prior to Midterm test; 35-40% from the lectures covered after the midterm test)]
- Format of Examinations: Short essay questions, multiple choice questions, matching questions, completion of tables, drawing of diagrams of immune system structures and knowledge of functions of each component; supporting your answers with labeled diagrams and EXAMPLES.
Due dates
Students should note the dates for tests, examinations and submission of the laboratory record book as shown in the Assessment Format as highlighted on page 10 of this unit outline. The laboratory record books are to be deposited in the School’s reception office and clearly labeled with your name, student number, unit name and the date and year of submission.

Mobile Phones
If you have a mobile, please ensure that it is TURNED OFF during lecture and practical sessions as a courtesy to both lectures and other students. Students who do not comply with this request can be asked to leave the class.

Copyright Requirements
As a student of Curtin you must be familiar with the requirements of the University's Copyright Procedures. Guidance is available to you at the following web page (http://lisweb.curtin.edu.au/copyright/) under the heading Information for All Students. Curtin's Copyright Procedures can be found under the heading Related Curtin Policies and Procedures whilst the Copyright Act can be accessed from the Additional information heading at that web site should you wish to understand the source of the Procedures.

Failure to comply with the University's policies and procedures on Copyright and IT/IS use may include suspension or termination of enrolment, fines, withdrawal of privileges for use of the University's ICT facilities and services and, depending on what is copied, stored or communicated, may also render you liable to prosecution in the courts.

Plagiarism Policy (as adopted by the School of Biomedical Sciences)
It is not acceptable to simply copy the words of other students or authors when completing the weekly exercises and assignments in this unit. This action constitutes plagiarism and is regarded as academic malpractice. 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.

The School of Biomedical Sciences advises students that it will use screening software to check for plagiarism in submitted work suspected of containing plagiarised material and also for routine screening of text as deemed appropriate by the Head of School.

Useful examples and explanations of plagiarism may be seen at the following web site – These will help you in understanding the nature of this form of academic malpractice.

http://www.indiana.edu/~wts/wts/plagiarism.html

As a guide only, typical penalties which may be imposed by the School of Biomedical Sciences for some of the more common types of plagiarism (including collusion) are shown in the Table below. Please note that each case of academic malpractice is assessed individually, and that penalties actually imposed by the Head of School (or deligatee) may vary from the examples shown in the Table.

<table>
<thead>
<tr>
<th>Example</th>
<th>Degree of seriousness</th>
<th>Typical Penalty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students submitting very similar work (even as a result of legitimate co-operation)</td>
<td>Collusion Minor to Severe depending on context</td>
<td>Loss of marks for that question or assignment etc by both students</td>
</tr>
<tr>
<td>Not referencing input (factual statements, definitions etc) where students’ words are used</td>
<td>Minor to Intermediate</td>
<td>Loss of 5% of assessment entity for each instance</td>
</tr>
<tr>
<td>Not referencing input where</td>
<td>Depends on context, but</td>
<td>Loss of 50 – 100% of marks</td>
</tr>
</tbody>
</table>


Supplementary Examinations

Supplementary examinations are awarded only at the discretion of the Board of Examiners. The aim of a supplementary examination is to allow the student or correct minor problems/deficiencies in the initial assessment and not to gain extra study time or correct major problems. The number of supplementary examinations awarded will be kept to a minimum for any one examination period and for this course of study.

NB Supplementary examinations are not automatically awarded. The Board of Examiners will carefully review individual cases. No written application for supplementary examination will be considered.

Supplementary examinations, 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 24 hours after the Board of Examiners meeting. It is your responsibility to check your status. Students should note that supplementary examinations for units conducted in the School will be held on Thursday December 16 and Friday December 17. Students must check their OCC every week, ESPECIALLY after the final examination and MUST be available for supplementary examination if it is awarded. A student who does not sit for a scheduled supplementary examination has no claim to a further examination. If you are awarded a supplementary examination it is imperative that you confirm the time and venue for the exam.

Deferred Assessment

Deferment of an examination is not automatic. Students may be permitted by the relevant Board of Examiners to defer an examination or other assessment where circumstances outside their control have arisen. However, a student's overall performance may be taken into account in granting permission to defer an examination.

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 examination period or assessment date during the semester. Detailed medical certificates should be attached to the application where appropriate.

The prescribed application form may be obtained either from Admission and Student Records, the Course Administrator or the First Year. Completed form must be submitted to the Course Administrator. This includes applications for deferred assessment for units in your course of study conducted by other Schools.

Reminder Notes for Students

1: Students must score a total of 50 percent [%] marks in each assessment category to pass the unit.
2: Students must not go on leave unless they have received the final results and know their status.
3: Students must be available to sit the supplementary or deferred examinations in Molecular and Cellular Immunology 231, which will be held within 2 weeks of announcement of the final results. Deferred examinations in this unit will be held on the same day as the Supplementary examinations. For this semester, these examinations will
be held on Thursday December 16 and Friday December 17. No additional supplementary or deferred examination will be offered after this date.

THE LECTURE AND LAB SCHEDULES ARE SHOWN ON PAGE 14-16.
<table>
<thead>
<tr>
<th>DATE (2012)</th>
<th>LECTURE TOPIC</th>
<th>LECTURER</th>
<th>TEXTBOOK CHAPTERS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Orientation</td>
<td>SBMS TKM</td>
<td>Separate schedule</td>
</tr>
<tr>
<td>Feb 29</td>
<td>- Overview of immunobiology</td>
<td>TKM</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>- Innate Immunity I</td>
<td>TKM</td>
<td></td>
</tr>
<tr>
<td>March 7</td>
<td>- Innate Immunity II</td>
<td>TKM</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>- Acquired immunity</td>
<td>TKM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&amp; Immune system organs</td>
<td>TKM</td>
<td></td>
</tr>
<tr>
<td>March 14</td>
<td>- Immunogens/Antigens</td>
<td>TKM</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>- Antibody Structure</td>
<td>TKM</td>
<td>2, 3</td>
</tr>
<tr>
<td>March 21</td>
<td>- Antibody function</td>
<td>TKM</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>- Mechanisms of Antigen-antibody reactions</td>
<td>TKM</td>
<td>5</td>
</tr>
<tr>
<td>March 28</td>
<td>- Antibody-based immunoassays</td>
<td>BB</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>- Cell-based immunoassays</td>
<td>BB</td>
<td></td>
</tr>
<tr>
<td>April 4</td>
<td>- Monoclonal antibody production &amp; Practical Applications</td>
<td>BB</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>- Genetic basis of antibody diversity</td>
<td>BB</td>
<td>6</td>
</tr>
<tr>
<td>April 9-13</td>
<td>TUTION-FREE WEEK (INCLUDING EASTER)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April 18</td>
<td>- Midterm test</td>
<td>TKM [To be confirmed]</td>
<td>Chapters 1-5</td>
</tr>
<tr>
<td></td>
<td>- Complement pathways and regulation</td>
<td>DC</td>
<td>13</td>
</tr>
<tr>
<td>April 25</td>
<td>ANZAC DAY PUBLIC HOLIDAY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May 2</td>
<td>- B versus T cells</td>
<td>TKM</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>- Role of B &amp; T cells in humoral immunity</td>
<td>TKM</td>
<td>9</td>
</tr>
<tr>
<td>May 9</td>
<td>- MHC Structure</td>
<td>BB</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>- Antigen Presentation</td>
<td>BB</td>
<td>8</td>
</tr>
<tr>
<td>May 16</td>
<td>- Cytokines in Immune response</td>
<td>DN</td>
<td>8</td>
</tr>
<tr>
<td>May 23</td>
<td>- Hypersensitivities</td>
<td>TKM</td>
<td>14-16</td>
</tr>
<tr>
<td></td>
<td>- Immune response to preventable IDs</td>
<td>TKM</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>- Review for the final examination</td>
<td>TBA</td>
<td></td>
</tr>
<tr>
<td>May 28-June 1</td>
<td>STUDY WEEK</td>
<td></td>
<td></td>
</tr>
<tr>
<td>JUNE 4-15 [EXAMINATION PERIOD]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Final examination will cover all the material covered in the unit [Worth 45% (5-10% for lectures 1-5; 35-40% from the lectures covered after the midterm test)]</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Format of Examinations: Short essay questions, multiple choice questions, matching and/or true false questions, completion of tables, drawing of diagrams of immune system structures and knowledge of functions of each component; supporting your answers with labeled diagrams and EXAMPLES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date (2012)</td>
<td>PRACTICAL TOPIC</td>
<td>LECTURER</td>
<td>NOTES</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>----------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| March 1, 2  | - Orientation and Transition to Course  
- Laboratory Manual information  
- Student blood sampling [20-80 ml]  
- Separation of serum from blood samples | AP/BB/TKM/AY |       |
| March 8, 9  | - IA: Fractionation of human serum  
- IB: Protein content of prepared fractions; | BB | Students |
| March 15, 16| - Estimation of protein content of serum protein fractions | BB | Students |
| March 22, 23| - Lymphocyte separation | BB | Students |
| March 29, 30| Nature of prepared fractions  
- Zone electrophoresis  
- Immunoelectrophoresis  
- Ouchterlony immunodiffusion | TKM | Demonstration & Discussion Demonstration & Discussion Students |
| April 4     | - Check results and interpret  
- Enzyme-linked immunosorbent assay [ELISA]: Step I | TKM | Students Method demonstration & discussion; coating done by A Yap |
| April 9-13  | **TUITION FREE WEEK** |       |       |
| April 19, 20| - Enzyme-linked immunosorbent assay [ELISA]-Step II | TKM | Students |
| April 26, 27| - Enzyme-linked immunosorbent assay [ELISA]-Step III | TKM | Students |
| May 3, 4    | Western Blotting | AP | Demonstration and discussion of concept |
| May 10, 11  | Western Blotting [contd]  
- Revision Session | AP |       |
| May 24      | - Practicum Test | AP |       |
| May 25      | - Review Session for final examination | TBA | This session is important to attend FYOS |

*Laboratory Program For MCI 231 Students:*

- **Thursday Group A: 12-2PM; this group must attend the follow up session on Friday 2-3PM**
• **Group B: 3-5PM; this group must attend the follow up laboratory session on Friday 3:30-4:30PM**

**Participating Staff:** AP: Adrian Paxman; BB: Brian Brestovac; TKM: Trilochan Mukkur [Unit Coordinator]