



The University of Southern Queensland

## Course specification

<b>Description: Medical Microbiology 2</b>						
Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	3315	50801	1, 2006	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS002
<b>Student contribution band:</b>	2
<b>ASCED code:</b>	010911

### STAFFING

Examiner: Michael Kotiw  
Moderator: Bernadette McCabe

### REQUISITES

Pre-requisite: BIO2205

### RATIONALE

The course aims to provide a thorough understanding of the principles of human immunology with particular emphasis on host response to microbial infection. The course particularly aims to provide an understanding of immunological processes associated with the ability to distinguish self from non-self antigens, immunochemistry, immunobiology, abnormal immune responses including autoimmunity and allergies/hypersensitivities. The course also aims to provide an understanding of the pathogenic processes associated with a range of infectious agents with an emphasis on viruses infecting humans.

### SYNOPSIS

This course provides the principles underpinning humoral or cellular defence mechanisms associated with the host response to infection. The course includes a study of innate defence mechanisms, antigenic specificity, induction of humoral and cellular immune responses, immunoglobulin structure, function and genetic basis of antibody diversity, the role of the immune system in health and disease including cell-mediated immunity, hypersensitivity reactions, autoimmunity, immune tolerance, and vaccine development strategies. The course also leads students to understand the mechanisms of microbial pathogenesis with specific emphasis on viral diseases affecting humans. The practical component of the course is project based and is intended to provide students with hands-on experience in undertaking immunological and virological investigations. The course provides candidates with a perspective of the diversity associated with medical microbiology investigations and provides students with career choices for their future.

## OBJECTIVES

On completion of this course students will be able to:

1. gain an awareness of the diversity of medically important infectious diseases;
2. describe and demonstrate an understanding of the nature of an integrated human immune system including aspects of the innate, humoral and cell mediated immune responses to infectious agents;
3. describe the different classes/subclasses of immunoglobulins/antibodies, their structure and function;
4. demonstrate an understanding of the concept of antibody specificity;
5. describe the role played by the innate defence mechanisms including inflammatory responses, the complement system and its function, antiphagocytic mechanisms and the role played by cytokines in protection against infectious disease;
6. describe the nature of autoimmune diseases and hypersensitivity;
7. describe concepts in vaccine development;
8. describe the biology and pathogenic mechanisms associated with major viral pathogens affecting humans;
9. perform rudimentary immunological investigations;
10. perform virus propagation and isolation from cell culture;

## TOPICS

Description	Weighting (%)
1. Overview of medical microbiology	4.00
2. Overview of the human immune system.	8.00
3. Immunogens and antigens	8.00
4. Antibody structure and function	8.00
5. B lymphocytes biology, activation and function	8.00
6. T lymphocytes biology, activation and function	8.00
7. Major histocompatibility complexes	8.00
8. Cytokines	8.00
9. Complement	4.00
10. Autoimmune diseases and hypersensitivity	4.00
11. Vaccinology	8.00
12. Virology	16.00
13. Mycosis	4.00
14. Parasitology	4.00

## TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone

+61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at <http://bookshop.usq.edu.au> click 'Semester', then enter your 'Course Code' (no spaces).

Coico, R, Sunshine, G & Benjamini, E *Immunology*, 5th edn, Wiley-Liss,  
(a short course)

Kotiw, M 2006, *Medical microbiology 2, course handbook*, USQ Publication, Toowoomba.

## REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Alberts, B et al 1994, *The molecular biology of the cell*, 3rd edn, Garland, New York.

Baron, S (ed) 1996, *Medical microbiology*, 4th edn, University of Texas, Galveston.

Brown, F 1994, *Recombinant vectors in vaccine development*, Karger, Basel, New York.

Brown, F et al 1993, *Vaccine design*, Chichester, New York.

Glazer, AN & Nikaido, H 1995, *Microbial biotechnology: Fundamentals of applied microbiology*, WH Freeman and Company, New York.

Glick, BR & Pasternak, JJ 1994, *Molecular biotechnology: Principles and applications of recombinant DNA*, ASM Press, Washington, DC.

Goldsby, RA, Kindt, TJ & Osborne, BA 2005, *Kuby immunology*, 5th edn, WH Freeman and Co,

Henderson, B et al 1999, *Cellular microbiology*, Wiley, New York.

Janeway, CA, Travers, P, Walport, A & Shloinchik, M 2001, *Immunology*, 5th edn, Churchill Livingstone, New York.

Liddell, JE & Cryer, A 1991, *A Practical guide to monoclonal antibodies*, Wiley, New York.

Mandell, et al 2000, *Mandell, Douglas and Bennett's principles and practice of infectious diseases*, 5th edn, Churchill Livingstone, New York, Vol 1&2.

Mims, C et al 1998, *Medical microbiology*, 2nd edn, Mosby, St Louis.

Murray, PR et al 2002, *Medical microbiology*, 4th edn, Mosby, St Louis.

Peters, J & Baumgarten, H (eds) 1992, *Monoclonal antibodies: A practical guide*, Springer-Verlag, New York.

Roitt, I, Brostoff, J & Male, D 2001, *Immunology*, 6th edn, Mosby, London.

Ryan, KJ 1994, *Sherris medical microbiology*, 3rd edn, Appleton & Lange, Norwalk, Conn.

Salyers, AA & Whitt, DD 2002, *Bacterial pathogenesis: A molecular approach*, 2nd edn, ASM Press, Washington.

Samelson, LE (ed) 1994, *Lymphocyte activation*, Karger, Basel.

Talwar, GP & Sood, OP 2003, *Therapeutic Antibodies*, Ranbaxy Science Foundation, Gurgaou, India.

Talwar, GP & Sood OP 2003, *Therapeutic Antibodies*, Ranbaxy Science Foundation, Gurgaou, India.

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3.00
Laboratory or Practical Classes	30.00
Lectures	26.00
Private Study	101.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
PROJECT REPORTS	40.00	40.00	07 Mar 2006 (see note 1)
3HR CLOSED EXAMINATION	60.00	60.00	END S1 (see note 2)

### NOTES

1. Examiner to advise the due date for Project Reports.
2. Examination dates will be available during the Semester. Please refer to the examination timetable when published.

## IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:  
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration. To maximize their chances of satisfying the objectives of the practical component of the course, students should attend and actively participate in the laboratory sessions in the course. The use of safe procedures in the laboratory will be strictly enforced and continuously monitored to ensure competent performance by students. Students who fail to attend sufficient number of practical sessions (less than 80% of total sessions) may be excluded from completion of the practical course on grounds of safety.
- 2 Requirements for students to complete each assessment item satisfactorily:  
To satisfactorily complete an individual assessment item a student must achieve at least 50% of the marks or a grade of at least C-. (Depending upon the requirements in Statement 4 below, students may not have to satisfactorily complete each assessment item to receive a passing grade in this course.)
- 3 Penalties for late submission of required work:  
If students submit reports after the due date without prior approval then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late.
- 4 Requirements for student to be awarded a passing grade in the course:  
To be assured of a passing grade, students must demonstrate, via the summative assessment items, that they have achieved the required minimum standards in relation

to the objectives of the course by obtaining at least 50% of the total marks available for the course

- 5 Method used to combine assessment results to attain final grade:  
The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.
- 6 Examination information:  
In a Closed Examination, candidates are allowed to bring only writing and drawing instruments into the examination.
- 7 Examination period when Deferred/Supplementary examinations will be held:  
No supplementary examinations will be offered in the laboratory component of the course. Any Deferred or Supplementary examinations for this course will be held during the Semester 3 examination period following this offering of the course.
- 8 University Regulations:  
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL <http://www.usq.edu.au/corporateservices/calendar/part5.htm> or in the current USQ Handbook.

## **ASSESSMENT NOTES**

- 9 Students, who, for medical, family/personal, or employment-related reasons, are unable to sit for the test or the examination at the scheduled time may apply to defer an assessment in a course. Such a request must be accompanied by appropriate supporting documentation. One of the following temporary grades may be awarded IDS (Incomplete - Deferred Examination); IDM (Incomplete - Deferred Make-up); IDB (Incomplete - Both Deferred Examination and Deferred Make-up).
- 10 In order to attend laboratory classes, students must provide and wear appropriate personal protective equipment. This shall include a laboratory coat, closed in shoes, and safety glasses. Such equipment must be approved by supervising staff. Failure to provide and wear the appropriate safety equipment will result in students being excluded from classes.