



The University of Southern Queensland

Course specification

Description: Medical Microbiology						
Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	3317	40908	1, 2005	ONC	1.00	Toowoomba

Academic group:	FOSCI
Academic org:	FOS002
Student contribution band:	2
ASCED code:	010911

STAFFING

Examiner: Michael Kotiw

REQUISITES

Pre-requisite: BIO2205

RATIONALE

The aim of this course is to enhance the student's understanding of medical microbiology at an advanced level. This requires a detailed knowledge of the mechanisms of microbial pathogenesis from a classical and molecular perspective. Detailed analysis of specific disease syndromes, together with discussion of relevant diagnostic and therapeutic options will enable the student to integrate these different fields of study and will enhance their capacity to make critical and informed judgements in a professional setting.

SYNOPSIS

This course builds on the foundations obtained in course BIO2205. The course focuses on the nature, diagnosis and control of diseases in humans caused by micro-organisms with an emphasis on enhancing the student's understanding of microbial pathogenesis at the molecular level. Areas of specific emphasis include the nature of microbial virulence factors, antimicrobial therapy and mechanisms of resistance, paradigms in microbe/host interactions and a system approach to clinical infectious disease syndromes.

OBJECTIVES

On completion of this course students will be able to:

1. demonstrate an understanding of a variety of methods available for the diagnosis and characterisation of microbial infections;
2. give an overview of the human immunological defences against microbial infection;
3. demonstrate an understanding of microbial virulence factors particularly bacterial and viral strategies for evading overcoming the host's defence systems;
4. demonstrate an understanding of the nature, mechanisms of activity, appropriate use and limitations of antimicrobial chemotherapeutic agents;

5. demonstrate an understanding of how microbes become resistant to chemotherapeutic agents;
6. demonstrate an understanding of viral pathogenesis and to be able to illustrate the understanding with reference to particular viral agents;
7. give an overview of mycotic and parasitic infections;
8. demonstrate an understanding through case studies, paradigms in host/microbe interactions;
9. demonstrate an understanding of the nature, diagnosis and options for management of specified infectious disease syndromes;
10. perform and interpret routine bacterial culture, identification and antibiotic sensitivity assays from clinical or pseudo clinical specimens;
11. perform and interpret bio and molecular assays to demonstrate the presence of virus in a cell line.

TOPICS

	Description	Weighting (%)
1.	Fundamentals of diagnosis and characterisation microbial infections: An overview of microbial pathogenesis; Defining infections; Conventional approaches to characterisation of infectious agents; Advances in characterisation of infectious agents - PCR, Probes, RFLPS.	12.00
2.	Fundamentals of the human immune response to infectious agents: The non specific defence mechanisms; The specific defence systems; Humoral immunity; Cell mediated immunity; Integration of the immune response.	12.00
3.	Microbial virulence factors (the bacteria): Colonisation; Invasive attributes; Evasion mechanisms; Exotoxins; Virulence gene control; Pathogenicity islands.	16.00
4.	Viral pathogenicity: Overview of molecular virology; Viral immunopathology; HIV diagnosis, pathogenesis and therapeutics; HBV diagnosis, pathogenesis and therapeutics; Case study: is it herpes?	16.00
5.	Antimicrobial therapeutics: Anti-bacterials; Anti-fungal; Anti-parasitics.	12.00
6.	Case studies in host/microbe interactions: Vibrio cholerae; Bordetella pertussis; Salmonella sp; Escherichia coli.	24.00
7.	Infectious syndromes: Gastric and duodenal ulcer; Endotoxaemia and ischaemia/reperfusion injury.	8.00

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).

Salyers, A A and Whitt, D D 2002, *Bacterial pathogenesis: a molecular approach*, 2nd edn, ASM Press, Washington.
(ISBN 1-55581-171X)

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.

Benjamini, E et al 2000, *Immunology: A Short Course*, 4th edn, Wiley, New York.

Mandell et al 2000, *Principles and Practice of Infectious Diseases*, 5th edn, Churchill Livingstone, New York, Vol 1&2.

Ryan, K J 1994, *Sherris Medical Microbiology*, Appleton & Lange, Norwalk, Conn.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3.00
Laboratory or Practical Classes	26.00
Lectures	26.00
Private Study	117.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
PROJECT REPORTS	40.00	40.00	01 Mar 2005 (see note 1)
3HR CLOSED EXAMINATION	60.00	60.00	END S1 (see note 2)

NOTES

1. Examiner to advise the end of semester 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.

- 2 Requirements for students to complete each assessment item satisfactorily:
To complete each of the assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item.
- 3 Penalties for late submission of required work:
If students submit assignments after the due date without prior approval then a penalty of 5% of the total marks gained by the student for the assignment will 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: (i) obtaining at least 50% of the total marks available for the course; and (ii) obtaining at least 50% of the total marks assigned to the Project Reports.
- 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 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.