



The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>. Please consult the web for updates that may occur during the year.

Description: Infectious Diseases

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	8103	86958	1, 2009	ONC	1.00	Toowoomba

Academic group:	FOSCI
Academic org:	FOS002
Student contribution band:	6
ASCED code:	010913

STAFFING

Examiner: Michael Kotiw
Moderator: John Dearnaley

REQUISITES

Pre-requisite: BIO2205

RATIONALE

The aim of the course is to enhance the student's understanding of medical bacteriology at an advanced level. This requires a detailed knowledge of the mechanisms of bacterial 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. Further, through undertaking laboratory exercises, and literature surveys, the aim of this course is to provide an in depth understanding of current molecular and conventional investigative tools involved in the analysis of complex infectious diseases. The course also aims to provide training and experience in research methodology so as to provide a platform for candidates wishing to undertake studies for higher degrees by research.

SYNOPSIS

The course focuses on the nature, diagnosis and control of diseases in humans caused by bacteria with an emphasis on enhancing the student's understanding of bacterial pathogenesis at the molecular level. Areas of specific emphasis include the nature of bacterial virulence factors, antibacterial therapy and mechanisms of resistance, paradigms in microbe/host interactions and a system approach to clinical infectious disease syndromes. Students will undertake research methods training by completing Investigative Research Reports. Students will also be involved in the development and application of conventional and molecular technologies for organizing, analysing and interpreting complex microbiological data. Candidates will undertake laboratory exercises in a group environment, but will be required to prepare independent reports for assessment. Students will develop microbiological, investigative, analytical and presentation skills and be able to provide

advanced technical reports and recommendations on the management of infectious disease syndromes. Specific Topics will be published in the course handbook.

OBJECTIVES

On completion of this course students will be able to:

1. give an overview of examples of major clinical diseases due to infections by bacteria (All assessments);
2. demonstrate an understanding of methods available for the diagnosis and characterisation of bacterial infections (All assessments);
3. give an overview of the human immunological defences against microbial infection (All assessments);
4. demonstrate an understanding of bacterial virulence factors (All assessments);
5. demonstrate an understanding of the nature, mechanisms of activity, appropriate use and limitations of antibacterial chemotherapeutic agents (All assessments);
6. demonstrate an understanding of how bacteria become resistant to chemotherapeutic agents (All assessments);
7. demonstrate an understanding through case studies, paradigms in host/bacteria interactions (All assessments);
8. demonstrate an understanding of the nature, diagnosis and options for management of specified infectious disease syndromes (All assessments);
9. undertake research methods training by completing an Investigative Research report (Research Project Reports);
10. use a wide range of conventional and molecular laboratory techniques to formulate and solve complex infectious disease problems (Research Project Reports);
11. undertake, synthesize and deliver coherent literature searches relevant to infectious diseases (Literature review);
12. undertake and independently solve complex microbiological problems (Research Project Reports);
13. demonstrate effective skills for searching literature databases and electronic resources (Literature review);
14. demonstrate skills and knowledge required to perform laboratory experiments safely with appropriate equipment, including molecular and conventional microbiological apparatus, computer software and hardware for data acquisition and analysis (Research Project Reports);
15. demonstrate skills required for the preparation and submission of a detailed laboratory report (Research Project Reports);
16. demonstrate the skills required for the preparation and submission of a detailed literature review (Literature review).

TOPICS

	Description	Weighting (%)
1.	Overview of medical microbiology	8.00
2.	Overview of medically important bacterial infections	8.00
3.	Fundamentals of diagnosis and characterisation of bacterial pathogens: conventional approaches to characterisation of bacterial agents; determining colonisation vs infection; advances in characterisation of bacterial agents - PCR, Probes, RFLPS	8.00

4.	Fundamentals of the human immune response to infectious agents: cells of the immune system; the specific and non specific defence mechanisms; humoral immunity; cell mediated immunity; integration of the immune response	24.00
5.	Bacterial virulence factors: colonisation; invasive attributes; evasion mechanisms; exotoxins; virulence gene control; pathogenicity islands	12.00
6.	Bacterial control: antibiotics and therapeutics	12.00
7.	Case studies in host/bacterial interactions	12.00
8.	Infectious syndromes: gastric and duodenal ulcer; endotoxaemia; ischaemia/reperfusion and endotoxic shock	16.00

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).

Kotiw M 2009, *BIO8103 Infectious Diseases, Course Handbook*, USQ Publication, Toowoomba.
 Salyers AA & Whitt DD 2002, *Bacterial pathogenesis: a molecular approach*, 2nd edn, ASM Press, Washington.

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 2003, *The Molecular Biology of the Cell*, 4th edn, Garland, New York.

Coico R, Sunshine G & Benjamini, E 2003, *Immunology: A Short Course*, 5th edn, Wiley, New York.

Janeway CA et al 2005, *Immunobiology*, 6th edn, Garland Science, New York.

Mandell GL et al 2005, *Principles and Practice of Infectious Diseases*, 6th edn, Churchill Livingstone, New York, Vol 1&2.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	2.00
Laboratory	30.00
Lectures	26.00
Private Study	101.00
Tutorials	13.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
LITERATURE REVIEW	30.00	30.00	02 Mar 2009 (see note 1)
RESEARCH PROJECT REPORT	100.00	40.00	02 Mar 2009 (see note 2)
2 HOUR CLOSED EXAMINATION	100.00	30.00	END S1 (see note 3)

NOTES

1. Examiner to advise the due dates for the Literature Review. Details of the requirements for the Literature Review will be provided by the examiner in the Infectious Diseases Course Handbook 2009.
2. Examiner to advise the due dates for the Research Project Report. Details of the requirements for the Research Project Report will be provided by the examiner in the Infectious Diseases Course Handbook 2009.
3. Examination due 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 receiving a passing grade a student must achieve at least 50% of the total weighted 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:
Any Deferred or supplementary examinations for this course will be held during the next examination period.
- 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

- 1 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.