



The University of Southern Queensland

## Course specification

### Description: Introductory Microbiology for Wine Science

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	2405	55378	2, 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: Bernadette McCabe

Moderator: Michael Kotiw

### REQUISITES

Pre-requisite: BIO1101

### RATIONALE

Microbiological considerations are important in the field of wine science including the wine industry. It is thus important that professionals in this field become aware of the involvement and significance of micro-organisms in this field of study, and also become sufficiently familiar with the subject to gain an appreciation of the role played by micro-organisms in the environment and the spoilage of wine.

### SYNOPSIS

This introductory study in microbiology for wine science is aimed at providing knowledge to professionals in this field on the impact that micro-organisms can have in ensuring high standards of the products in wine industry, notwithstanding the relevance of microbiology in improving our daily lives and the environment. Explored in this course are the history and diversity of micro-organisms, cell structure and function, metabolism, nutrition, growth and control of micro-organisms, classification and reproduction of fungi, factors affecting the interactions of micro-organisms including bacteria, viruses, fungi and protists with plants, an introduction to the types and roles of micro-organisms found in wines including yeast, bacteria involved in wine making, control of micro-organisms in wine making, plant virology and their impact on the wine industry.

### OBJECTIVES

On successful completion of this course students majoring in Wine Science will be able to:

1. show sufficient familiarity with the history and study of microbiology to explain past misconceptions and current conventional wisdom;

2. make meaningful comments about each of the microbiological terms encountered during the course;
3. demonstrate a useful knowledge of the taxonomy and morphological features of the various organisms normally regarded as microorganisms - viruses, bacteria, fungi and protozoa;
4. show an understanding of the various metabolic processes found in bacteria and the role of these in ecological, biotechnological and pathogenic functions;
5. describe the general characteristics, classification, in vivo and in vitro replication of viruses and their relevance to the wine industry;
6. describe the range of micro-organisms associated with wine;
7. describe the role of the micro-organisms in wine production;
8. describe measures applied in the winery to control the growth of these wine organisms;
9. describe the genetic structure, classification and replication of viruses including plant viruses;
10. describe the impact of micro-organisms on the wine industry;
11. demonstrate sufficient manipulative competence to be judged safe and efficient in common laboratory procedures;
12. demonstrate skills and knowledge required to perform laboratory experiments safely with appropriate equipment.

## TOPICS

	Description	Weighting (%)
1.	Module 1: History and diversity of micro-organisms	4.00
2.	Microscopy	4.00
3.	Overview of cell structure and function	8.00
4.	Nutrition, growth and control of micro-organisms	8.00
5.	Microbial metabolism	12.00
6.	Microbial genetics	8.00
7.	Introduction to the viruses	4.00
8.	Introduction to the fungi	4.00
9.	Microbial ecosystems I: General concepts	4.00
10.	Module 2: An introduction to the types and roles of micro-organisms found in wines	4.00
11.	Yeast: Classification and growth during wine fermentation	16.00
12.	Bacteria involved in wine making	8.00
13.	Control of micro-organisms in wine making	8.00
14.	Virus diseases of plants	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).

Black, JG 2004, *Microbiology: principles and explorations*, 6th edn, John Wiley & Sons Inc, ISBN: 0471420840.

## 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.

Barnett, JA, Payne RW & Yarrow, D 2000, *Yeasts: characteristics and identification*, 2nd edn, Cambridge University Press, Cambridge.

Bergey, D 1993, *Bergey's manual of determinative bacteriology*, 9th edn, Lippincott Williams & Wilkins, Baltimore.

Bonnett, R 2002, *Wine microbiology and biotechnology*, Taylor & Francis Inc, New York.

Delfini, C & Formica, JW 2001, *Wine microbiology: science and technology*, Marcel Dekker Inc, New York.

Fleet, GH 1993, *Wine microbiology and biotechnology*, Hardwood Academic Publishers, Switzerland.

Fugelsang, KC 1997, *Wine microbiology*, Chapman & Hall, New York.

Goswell, RW 1986, Microbiology of table wines, *Developments in food microbiology*, Elsevier Science Publishing, New York.

Jackson, RS 2000, *Wine science principles, practice, perception*, 2nd edn, Academic Press, San Diego, California.

Krejer van-Rij, NJW 1984, *The yeasts: a taxonomic study*, 3rd edn, Elsevier Science Publishers, Amsterdam.

Marriott, NG 1999, *Principles of food sanitation*, 4th edn, Aspen Publishers, Gaithersbury, Maryland.

Martinko, JM, Madigan, MT & Parker, J 2003, *Brock biology of microorganisms*, 10th edn, Prentice Hall, Englewood Cliffs.

Prescott, LM, Harley, JP & Klein, DA 2002, *Microbiology*, 5th edn, McGraw Hill, New York.

Ribereau-Gayon, R, Dubourdieu, D, Doneche B & Lonvaud, A 2000, *The handbook of enology, Volume 1: The microbiology of wine and vinification*, John Wiley & Sons, New York.

Zoecklein, BW, Fugelsand, KC, Gump, BH & Nury, FS 1995, *Wine analysis and production*, Chapman Hall, New York.

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## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3.00
Laboratory or Practical Classes	24.00
Lectures	24.00
Private Study	105.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg(%)	Due date
INTERNAL USE ONLY	0.00	0.00	25 Jul 2006
INTERNAL USE ONLY	0.00	0.00	25 Jul 2006
1HR CLOSED TEST-MID SEM THEORY	100.00	30.00	25 Jul 2006 (see note 1)
3HR CLOSED EXAM-END SEM THEORY	100.00	70.00	END S2 (see note 2)

### NOTES

1. The 1 Hour Closed Test (Mid Semester theory) will be held in September 2006. The exact date will be advised by the Examiner.
2. Examination dates for the 3 Hour Closed Examination (End Semester Theory) 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.
- 2 Requirements for students to complete each assessment item satisfactorily:  
To complete each of the assignments satisfactorily, students must obtain at least 50% of the marks available for the test. To complete the examination satisfactorily, students must obtain at least 50% of the marks available for the examination. To complete the practical component satisfactorily, students must obtain at least 50% of the marks available in the practical test.
- 3 Penalties for late submission of required work:  
If students submit assignments after the due date without prior approval then a penalty of up to 10% of the total marks available 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 satisfactorily completing all summative assessment items (the examination and tests).

- 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:  
Candidates are allowed to bring only writing and drawing instruments into the Closed examination.
- 7 Examination period when Deferred/Supplementary examinations will be held:  
Any Deferred or Supplementary examinations for this course will be held in the semester 3 examination period and the examiner will advise students involved in writing of the date time and location of any such examination.
- 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.
- 10 Students who, for medical, family/personal, or employment-related reasons, are unable to complete an assignment or to sit for an 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).
- 11 The Examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances. The Faculty will normally only accept assessments that have been written, typed or printed on paper-based media. The Faculty will NOT accept submission of assignments by facsimile. Students who do not have regular access to postal services or who are otherwise disadvantaged by these regulations may be given special consideration. They should contact the examiner of the course to negotiate such special arrangements.