



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: Wine Composition, Stability and Analysis

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
WIN	2102	91580	2, 2009	ONC	1.00	Toowoomba

<b>Academic group:</b>	FOSCI
<b>Academic org:</b>	FOS002
<b>Student contribution band:</b>	6
<b>ASCED code:</b>	019905

### STAFFING

Examiner: Ursula Kennedy  
Moderator: Robert Learmonth

### REQUISITES

Pre-requisite: WIN1101 and CHE1110

### RATIONALE

This subject provides an introduction to the principal chemical components that influence wine, and analysis of these components. The chemistry of components and potential spoilage reactions is discussed, as well as chemistry of wine sensory components.

### SYNOPSIS

This course is aimed at providing an awareness of how chemistry can be used to interpret, unify and predict outcomes of winemaking actions. The course introduces the principles of acidity, buffering, chemical equilibria and oxidation in wine making. The course also considers measurement and control in winemaking, considerations for chemical analyses of wine, juice and wine acidity, sulphur dioxide in winemaking, oxidation and its management in grapes, juice and wine, chemistry of wine phenolic compounds and sensory components, and wine chemical stability issues.

### OBJECTIVES

On completion of this course students will be able to:

1. describe the basic process and outcomes of fermentation in chemical terms (Assignment 1, Exam);
2. discuss in detail the behaviour of wine acids and the preservative sulphur dioxide as they pertain to juice and wine (Assignment 1, Exam);
3. explain different ways of manipulating the fermentation environment to achieve the desired winemaking conditions (Exam);
4. interpret basic units of measurement (Assignment 1);
5. perform calculations required in oenology (Assignment 1);

6. describe the behaviours of sorbic and ascorbic acids in wine (Exam);
7. explain the action and nature of phenolic compounds found in wine and juice (Exam);
8. interpret and explain the effects of oxidation on wine and juice (Assignment 2, Exam);
9. demonstrate knowledge of factors causing wine instability and management of these (Assignment 2, Exam);
10. explain the origins of wine haze (Assignment 2, Exam);
11. outline the beneficial and spoilage reactions that can occur, and appraise the winemaking interventions that may be undertaken to optimise wine quality (Assignment 2, Exam);
12. describe and identify wine chemical components that impact on sensory attributes (Exam).

## TOPICS

Description	Weighting (%)
1. Introduction to wine chemistry	10.00
2. Measurement and control in winemaking	10.00
3. Introduction to chemical analysis of wine: equipment, measurement units, accuracy, precision, sensitivity, detection limits, selectivity, specificity, calculations	20.00
4. pH and acid profiles in juice and wine	10.00
5. Uses and measurement of sulphur dioxide in winemaking, interactions of sulphur dioxide and other wine components	10.00
6. Oxidation and its management in grapes, juice and wine	10.00
7. Chemistry and reactivity of phenolic compounds in juice and wine, polymerisation, ageing and oxidation of wine pigment compounds	10.00
8. Chemistry of sensory components of wine	10.00
9. Wine stability: protein stability, bitartrate stability, acidification and haze management	10.00

## 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).

Hornsey, IS 2007, *Chemistry and biology of winemaking*, Royal Society of Chemistry Publishing, Cambridge, UK.

(ISBN: 978-0-85404-266-1)

Zoecklein, BW, Fugelsang, KC, Gump, BH & Nury, FS 1995, *Wine analysis and production*, Aspen Publishing, Gaithersburg.

(ISBN 0 412 98921 2)

## 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.

Boulton, RB, Singleton, VL, Bisson, LF & Kumkee, RW 1999, *Principles and practices of winemaking*, Aspen Publishing, Gaithersburg.

(ISBN: 0 8342 1270 6)

Clarke, RJ & Bakker, J 2004, *Wine: flavour chemistry*, Wiley-Blackwell,

(ISBN: 978-1-4051-0530-9)

Halliday, J & Johnson, H 2006, *The art and science of wine*, Winetitles, Adelaide.

(ISBN 1740664590)

Iland, P, Bruer, N, Edwards, G, Weeks, S & Wilkes, E 2004, *Chemical analysis of grapes and wine: techniques and concepts*, Patrick Iland Wine Promotions Pty Ltd, Adelaide.

Margalit, Y 2004, *Concepts in wine chemistry*, 2nd edn, Wine Appreciation Guild,

(ISBN-10: 1891267744, ISBN-13: 978-1891267741)

Peynaud, E 1985, *Knowing and making wine*, Wiley, New York.

Rankine, BC 2004, *Making good wine: a manual of winemaking practice for Australia and New Zealand*, MacMillan, Sydney.

Ribereau-Gayon, P, Dubourdieu, D, Doneche, B & Lonvaud, A 2006, *Handbook of Enology - volume 1: the microbiology of wine and vinifications*, John Wiley & Sons, Hoboken, New Jersey.

(ISBN 0470010347)

Ribereau-Gayon, P, Glories, Y, Maujean, A & Dubourdieu, D 2006, *Handbook of Enology - volume 2: stabilization and treatments*, John Wiley & Sons, Hoboken, New Jersey.

(ISBN 047090371)

## STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Directed Study	54.00
Examinations	2.00
Private Study	83.00
Tutorials	26.00

## ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
ASSIGNMENT 1	20.00	20.00	20 Jul 2009 (see note 1)
ASSIGNMENT 2	20.00	20.00	20 Jul 2009 (see note 2)
2 HOUR RESTRICTED EXAMINATION	60.00	60.00	END S2 (see note 3)

### NOTES

1. Examiner will advise due dates of Assignments 1 and 2.
2. Examiner will advise due dates of Assignments 1 and 2.
3. The date of the exam will be during the examination period and will become available during the semester. Please check the exam timetable once published.

## IMPORTANT ASSESSMENT INFORMATION

- 1 Attendance requirements:  
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures and tutorials) 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 assessment items satisfactorily, students must obtain at least 50% of the marks available for each assessment item. (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 assignments after the due date without (prior) approval of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late up to ten working days at which time a mark of zero may be recorded. No assignments will be accepted after model answers have been posted.
- 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 aggregate of the weighted marks obtained for each of the summative assessment items in the course.
- 6 Examination information:  
Candidates are allowed access only to specific materials during a Restricted Examination. The only materials that candidates may use in the restricted examination for this course are: writing materials and translation dictionary. Students whose first language is not English, may, take an appropriate unmarked non-electronic translation dictionary (but not technical dictionary) into the examination. Dictionaries with any handwritten notes will not be permitted. Translation dictionaries will be subject to perusal and may be removed from the candidate's possession until appropriate disciplinary action is completed if found to contain material that could give the candidate an unfair advantage.

- 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**

- 9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner. Students must retain a copy of each item submitted for assessment. If requested by the Examiner, students will be required to provide a copy of the assignments submitted for assessment purposes. Such copies should be despatched to USQ within 24 hours of receipt of a request being received. The examiner of a course may grant an extension of the due date of an assignment in extenuating circumstances.