



<b>Course Code:</b>	1001GRC
<b>Course Name:</b>	Chemistry of Biological Systems 1
<b>Trimester:</b>	Trimester 2, 2019
<b>Program:</b>	Diploma of Health Sciences
<b>Credit Points:</b>	10
<b>Course Coordinator:</b>	Tessa Daal
<b>Document modified:</b>	7 May 2019

### Teaching Team

Your lecturer/tutor can be contacted via the email system on the portal.

Dr Michael Hahn [michael.hahn@portal.griffithcollege.edu.au](mailto:michael.hahn@portal.griffithcollege.edu.au)

### Staff Consultation

Your lecturer/tutor is available each week for consultation outside of normal class times. Times that your lecturer/tutor will be available for consultation will be given in the first week of lectures. A list of times and rooms will be published on the Griffith College Portal under the “myTimetable” link.

### Prerequisites

To successfully enrol in this course, you must have completed:

- BRM100 - Essential Mathematics
- BRH100 – Essential Mathematics

## **Brief Course Description**

Chemistry of Biological Systems I is a 10 Credit Point course situated within the first trimester of the Diploma of Health Science. The Diploma of Health Science is designed to provide students with a pathway to:

- \* further university studies in the Health Sciences, or
- \* direct employment.

This course introduces the basic chemical principles that underlie biological systems. Upon completion of this course, students will be able to demonstrate knowledge of selected chemistry concepts, principles and theories, with some application to biological phenomena. The foundation provided in this course will allow students to be able to further develop their chemistry knowledge and skills relevant to health and medical sciences in later years. Students will learn about how matter is classified and measured, atomic structure, bonding, chemical reactions, gases, pH, acids and bases chemical equilibrium and nuclear chemistry. There will be five laboratory sessions.

## **Rationale**

## **Aims**

The purpose of this course is to introduce students to the basic chemical principles that underlie biological systems. The course provides prerequisite knowledge for the subsequent courses, Chemistry of Biological Systems II, in addition to the health science-related courses which follow.

The foundation provided in this course will allow students to be able to further develop their chemistry knowledge and skills relevant to health and medical sciences in later years.

## **Learning Outcomes**

Upon completion of this course you will be able to:

1. demonstrate knowledge and understanding of selected concepts, principles and theories of chemistry with some application to chemical and biological phenomena;
2. demonstrate competency in simple analytical laboratory skills;
3. apply chemical principles to problem solving tasks.

## Texts and Supporting Materials

### Required Texts:

1. Hein, M., Pattison, S., & Arena. (2015). Introduction to general, organic and biochemistry (11th ed.). Hoboken, NJ: John Wiley & Sons Inc.
2. Printed Griffith College laboratory manual for Chemistry of Biological Systems I. Available on the Course site.
3. Printed Griffith College lecture notes for Chemistry of Biological Systems I. Available from Griffith University Campus Bookshop G40.

### Recommended Texts/References:

1. Brown T. L. (2015) Chemistry: the central science. Boston: Pearson.
2. John R. (2014) Chemistry companion. Queensland: Isis Publishing.
3. Wilson R. and Brown T. L. (2015) Solutions to exercises: Chemistry : the central science, 13th edition, Brown, LeMay, Bursten. Boston: Pearson

The Laboratory Rules document available on the course site via the Griffith College Student Portal.

### Required Support Materials (available from Griffith University Campus Bookshop G40):

- \* Laboratory gown
- \* Timer
- \* Marker pens
- \* Safety glasses

**Please Note:** It is only necessary to purchase one set of lab support materials for use across your Diploma program.

## Organisation and Teaching Strategies

The teaching methods in this course aim to provide students with the necessary tools to develop a strong foundation in chemical principles.

Teaching of the course will include lectures, laboratories tutorials and workshops throughout the trimester. Lectures are primarily to provide students with guidance toward an understanding of the qualitative concepts of foundation chemistry, although all requisite quantitative principles are also introduced. Students will gain practical skills, and develop competence in problem solving in a hands-on practical manner through laboratory sessions. Tutorials and workshops are designed to assist students in understanding fundamental chemistry content covered in weekly lectures (e.g. stoichiometry/chemical calculations etc) and also to assist students with reviewing key course concepts in preparation for examinations.

## Class Contact Summary

Classes for Chemistry of Biological Systems I include the following:

- \* **Lectures:** 3 hours per week (week 1 - 12 inclusive)
- \* **Tutorials/Workshops:** 2 hours per week (week 1 -12 inclusive)
- \* **Laboratories:** 2 hours per week (weeks 5, 7, 8, 10, 11).

### **Note: ATTENDANCE AT LABORATORIES AND LABORATORY TUTORIALS IS COMPULSORY.**

These practical sessions provide learning activities that are essential to the learning outcomes in this course. Students will work in small groups to conduct experiments and develop problem solving skills. Students are expected to attend their scheduled laboratory class except in extenuating circumstances.

An attendance roll will be maintained for all laboratories. Students must read the Laboratory Safety requirements prior to attending their first laboratory, and comply with the dress and behaviour codes as described; Students **MUST WEAR LABORATORY COATS AND CLOSED IN SHOES FOR ALL LABORATORIES**. Students will be required to bring their laboratory manuals to laboratories. Content covered in these laboratories complements lecture material and hence will be assessed in both laboratory reports and examinations.

**IMPORTANT: All students must undertake the on-line health and safety training prior to being permitted entry into laboratories.**

### **Attendance**

100% attendance is expected for all classes. You are reminded that your attendance in class will be marked for all elements. To receive full attendance, you must be present in the classroom on all occasions.

You are expected to bring work done at home to class for group and individual discussion. Further development of ideas is expected during tutorial time.

### **Preparation and Participation in Class**

You are expected to read your text book and the lecture notes plus attempt any tutorial/workshop exercises before class so that each week you can actively contribute to your learning and the learning of others in your classes. You are expected to ask and answer questions and to initiate discussions and stimulate debate in group and class situations.

### **Consultation Times**

Attendance during consultation times is optional but you are encouraged to use this extra help to improve your learning outcomes.

### **Course Materials**

Lecture notes will be available for purchase from the Griffith University Bookshop and the lecture slides will also be available to you on the 1001GRC MyStudy course site on the Griffith College student portal. You are advised to bring the lecture notes to each class so that extra notes can be added.

### **Independent Study**

Independent study requires that you spend time outside classes engaged in research necessary to complete your assignments. Research includes reading the required text books, using library and internet facilities. For this 10 CP course, you will need to spend at least 10 hours per week engaged in activities that will help your learning and fulfil the course objectives. Thus, provided you have well

used the formal contact hours each week, you would then complete any remaining hours engaged in independent study.

### Program Progression

You are reminded that satisfactory Program Progression requires that attendance in classes is maintained at equal to or greater than 80%, and that GPA is maintained at equal to or greater than 3.5 in any trimester [please see Griffith College Policy and procedures Library - Program Progression Policy - for more information].

### Content Schedule

Laboratory aims and summary of activities:

**Week 5:** Experiment 1 - Measurements

**Week 7:** Experiment 2 - Identification of Cations and Anions

**Week 8:** Experiment 3 - Oxidation and Reduction Reactions

**Week 10:** Experiment 4 - pH Titration

**Week 11:** Experiment 5 - Gases and Boyle's Law

### Weekly Teaching Schedule

Week	Topic	Activity	Readings
1	Measurement, Matter, Temperature	Lecture	Chapter 1 & 2
	Measurement, Matter, Temperature	Lecture	
	Introduction to the course and assessment.	Workshop	
	Introduction to the course and assessment.	Tutorial	
2	Atoms, Elements, Compounds,	Lecture	Chapter 1,3,4
	Atoms, Elements, Compounds,	Tutorial	
	Atoms, Elements, Compounds,	Workshop	
3	Electronic Structure, Bonding Basics & Nomenclature	Lecture	Chapter 5,6,10
	Electronic Structure, Bonding Basics & Nomenclature	Tutorial	

	Electronic Structure, Bonding Basics & Nomenclature	Workshop	
4	Chemical Bonding & Intermolecular Forces	Lecture	Chapter 4
	Chemical Bonding & Intermolecular Forces	Tutorial	
	Chemical Bonding & Intermolecular Forces	Workshop	
5	Stoichiometry	Lecture	Lecture notes
	Stoichiometry	Tutorial	
	Stoichiometry	Workshop	
6	Stoichiometry, Chemical Reactions	Lecture	Chapter 7,8,17
	Stoichiometry, Chemical Reactions	Tutorial	
	Stoichiometry, Chemical Reactions	Workshop	
7	Chemical reactions, Quantities and Chemical Reactions in Aqueous Solutions	Lecture	Chapter 9
	Quantities and Chemical Reactions in Aqueous Solutions	Tutorial	
	Quantities and Chemical Reactions in Aqueous Solutions	Workshop	
8	Solution Stoichiometry	Lecture	Chapter 13 14
	Solution Stoichiometry.	Tutorial	
	Solution Stoichiometry.	Workshop	
9	Acids, Bases and Salts	Lecture	Chapter 15
	Acids, Bases and Salts	Tutorial	
	Acids, Bases and Salts	Workshop	

10	Chemical Equilibrium, Acids –Base Equilibrium	Lecture	Chapter 16
	Chemical Equilibrium, Acids –Base Equilibrium	Tutorial	
	Chemical Equilibrium, Acids –Base Equilibrium	Workshop	
11	Gases, Nuclear Chemistry,	Lecture	Chapter 12, 18
	Gases, Nuclear Chemistry,	Tutorial	
	Gases, Nuclear Chemistry,	Workshop	
12	Revision		
13	Final Exam Block	Examination	

## Assessment

This section sets out the assessment requirements for this course.

### Summary of Assessment

Item	Assessment Task	Weighting	Relevant Learning Outcomes	Due Date
1	Mid trimester exam	18%	1,3	7
2	Course quiz	12%	1,3	11
3	Lab Quizzes x 3	20%	2,3	4, 9, 12
4	Final exam <i>- Students must pass this assessment with a mark of at least 40 out of 100 to pass the course</i>	50%	1,3	Exam Period

### Assessment Details

#### 1. Mid trimester exam

Rationale: The mid-trimester exam is intended to test the student's understanding, interpretation and application of the chemical principles studied and developed in the course.

A detailed explanation of assessment expectations will be provided during class and where necessary on the course site on the student portal.

Assessment details: The 70 minute mid-trimester examination, will be in the form of multiple choice (approx. 40%) and short answer questions (approx. 60%). Closed book

Marking criteria: The mid trimester examination will be marked against established model answers and undergo a full moderation process.

#### 2. Laboratory quizzes

Rationale: The laboratory quizzes (3x) contain self assessment activities.

Assessment details: Lab quizzes will be in weeks 4, 9 and 12. One lab quiz in each of these weeks.

The material covered in lab 1 will be assessed in lab quiz 1.

The material covered in lab 2 and lab 3 will be assessed in lab quiz 2.

The material covered in lab 4 and lab 5 will be assessed in lab quiz 3.

All Lab quizzes will consist of multiple choice questions.

Marking criteria: Short laboratory quizzes will be marked against moderated model answers.

#### 3. Course quiz

Rationale: The course quiz is intended to test the student's understanding, interpretation and application of the chemical principles studied and developed in the course. A detailed explanation of assessment expectations will be provided during class and where necessary on the course site on the student portal. The course quiz contains self assessment activities.

Assessment details: The course quiz will be 45 minutes long and in the form of multiple choice



questions.

Marking criteria: The course quiz will be marked against established and moderated model answers.

#### **4. End-of trimester exam**

Rationale: The end-of-trimester exam is intended to test the student's understanding, interpretation and application of the chemical principles studied and developed in the course. A detailed explanation of assessment expectations will be provided during class and where necessary on the course site on the student portal.

Assessment details: The end-of-trimester exam will be three hours long and in the form of multiple choice and short answer questions. Closed book.

Marking criteria: The end-of-trimester examination will be marked against established model answers and undergo a full moderation process.

#### **Requirements to Pass the Course:**

In order to pass this course and in addition to meeting the laboratory requirements, students must:

- 1) attend and attempt all forms of assessment and must demonstrate a reasonable degree of competence in the required course objectives as examined in each form of assessment, AND**
- 2) obtain at least 40% (40/100) in the end of trimester examination, AND**
- 3) Achieve an overall course result (sum of all assessments) of 50%.**

#### **Submission and Return of Assessment Items**

Normally you will be able to collect your assignments in class within fourteen [14] days of the due date for submission of the assignment.

#### **Retention of Originals**

You must be able to produce a copy of all work submitted if so requested. Copies should be retained until after the release of final results for the course.

#### **Extensions**

To apply for an extension of time for an assessment item you must submit a written request to your lecturer via the Student Website at least 48 hours before the date the assessment item is due. Grounds for extensions are usually: serious illness, accident, disability, bereavement or other compassionate circumstances and must be able to be substantiated with relevant documentation [e.g. medical certificate]. Please refer to the Griffith College website - Policy Library - for guidelines regarding extensions and deferred assessment.

#### **Penalties for late submission without an approved extension**

Penalties apply to assignments that are submitted after the due date without an approved extension. Assessment submitted after the due date will be penalised 10% of the TOTAL marks available for assessment (not the mark awarded) for each day the assessment is late. Assessment submitted more than five days late will be awarded a mark of zero (0) For example:

- > 5 minutes and <= 24 hours 10%
- > 24 hours and <= 48 hours 20%
- > 48 hours and <= 72 hours 30%
- > 72 hours and <= 96 hours 40%
- > 96 hours and <= 120 hours 50%

- > 120 hours 100%

Note:

- Two day weekends will count as one day in the calculation of a penalty for late submission.
- When a public holiday falls immediately before or after a weekend, the three days will count as one day in the calculation of a penalty for late submission.
- When two public holidays (e.g. Easter), fall immediately before or after, or one day either side of a weekend, the four days will count as two days in calculating the penalty for late submission.
- When a single public holiday falls mid-week, the day will not be counted towards the calculation of a penalty.

Please refer to the Griffith College website - Policy Library > Assessment Policy for guidelines and penalties for late submission.

### Assessment Feedback

Your assessment will be marked so that you can learn from your work. Feedback will be provided on a detailed criteria sheet (or in Turn It In) so that you can see the level you have reached in any skill. Your tutor will provide comments on your work (in written form). Your tutor will be happy to discuss your assignment further, if you wish. You may see your tutor in his/her consultation time. Marks awarded for assessment items, except those being moderated externally with Griffith University, will be available on the on the Student Portal within fourteen [14] days of the due date

### Generic Skills

Griffith College aims to develop graduates who have an open and critical approach to learning and a capacity for lifelong learning. Through engagement in their studies, students are provided with opportunities to begin the development of these and other generic skills.

Studies in this course will give you opportunities to begin to develop the following skills:

Generic Skills	Taught	Practised	Assessed
Written Communication	Yes	Yes	Yes
Oral Communication		Yes	
Information Literacy	Yes	Yes	Yes
Secondary Research		Yes	Yes
Critical and Innovative Thinking	Yes	Yes	Yes
Academic Integrity	Yes	Yes	Yes
Self Directed Learning		Yes	Yes
Team Work		Yes	Yes
Cultural Intelligence		Yes	
English Language Proficiency		Yes	Yes

## **Additional Course Generic Skills**

## **Additional Course Information**

Your feedback is respected and valued by your lecturers and tutors. You are encouraged to provide your thoughts on the course and teaching, both positive and critical, directly to your lecturer and tutor or by completing course and lecturer evaluations on the Griffith College portal whenever these are available.

Student feedback on their courses can be found by going to 'Student Feedback' under Support in the Griffith College Student Portal.

## **Academic Integrity**

Griffith College is committed to maintaining high academic standards to protect the value of its qualifications. Academic integrity means acting with the values of honesty, trust, fairness, respect and responsibility in learning, teaching and research. It is important for students, teachers, researchers and all staff to act in an honest way, be responsible for their actions, and show fairness in every part of their work. Academic integrity is important for an individual's and the College's reputation.

All staff and students of the College are responsible for academic integrity. As a student, you are expected to conduct your studies honestly, ethically and in accordance with accepted standards of academic conduct. Any form of academic conduct that is contrary to these standards is considered a breach of academic integrity and is unacceptable.

Some students deliberately breach academic integrity standards with intent to deceive. This conscious, pre-meditated form of cheating is considered to be one of the most serious forms of fraudulent academic behaviour, for which the College has zero tolerance and for which penalties, including exclusion from the College, will be applied.

However, Griffith College also recognises many students breach academic integrity standards without intent to deceive. In these cases, students may be required to undertake additional educational activities to remediate their behaviour and may also be provided appropriate advice by academic staff.

As you undertake your studies at Griffith College, your lecturers, tutors and academic advisors will provide you with guidance to understand and maintain academic integrity; however, it is also your responsibility to seek out guidance if and when you are unsure about appropriate academic conduct.

In the case of a breach of academic integrity made against a student he or she may request the guidance and support of a Griffith College Student Learning Advisor or Student Counsellor.

Please ensure that you are familiar with the Griffith College Academic Integrity Policy:

<http://policy.griffithcollege.edu.au/print.php?vdoc=tree->

[Students/Assessment%20and%20Examinations/Academic%20Integrity](http://policy.griffithcollege.edu.au/print.php?vdoc=tree-Students/Assessment%20and%20Examinations/Academic%20Integrity); this policy provides an overview of some of the behaviours that are considered breaches of academic integrity, as well as the penalties and processes involved when a breach is identified.

For further information please refer to the Academic Integrity Policy on the Griffith College website – Policy Library.

### **Risk Assessment Statement**

This course follows Griffith College and Griffith University Workplace Health and Safety Laboratory guidelines.

The aim of workplace health and safety is to make sure that people do not get sick or injured at the workplace. The legislation dealing with this in Queensland is called the Workplace Health and Safety Act, 1995. Anyone who can affect workplace health and safety has an obligation under this Act.

As a student, you have an obligation to yourself and others to undertake activities in a safe manner. You must follow instructions which are provided for safety. You must not put yourself or anyone else at risk. Care especially needs to be taken when you are performing activities which can affect others.

**Students must wear closed in shoes to all laboratory sessions for workplace health and safety reasons.**

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