1. General Course Information

1.1 Course Details

Course Code:	1001GRC
Course Name:	Chemistry of Biological Systems 1
Trimester:	Trimester 2, 2020
Program:	Diploma of Health Sciences
Credit Points:	10
Course Coordinator:	Tessa Daal
Document modified:	28/05/2020

Course Description

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, biological molecules, chemical reactions, gases, energy, pH, acids and bases, chemical equilibrium and nuclear chemistry. There will be five laboratory sessions that complement the learning in this course.

Assumed Knowledge

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

- BRH100 - Essential Mathematics
- BRM100 - Essential Mathematics

1.2 Teaching Team

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

Name	Email
Dr Michael Hahn	michael.hahn@portal.griffithcollege.edu.au

1.3 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 “Support and Services/Teacher Consultation Times” link.

1.4 Timetable

Your timetable is available on the Griffith College Portal at Class Timetable in Student and Services.

1.5 Technical Specifications

All students must have access to a computer or suitable mobile device.

2. Aims, Outcomes & Generic Skills

2.1 Course 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 course 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.

2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Demonstrate understanding and competency in solving chemistry related problems related to elements and compounds, early atomic theory and structure, nomenclature, quantitative composition of compounds and chemical equations with a biological application.

2. Demonstrate competency in solving chemistry related problems in stoichiometry, thermodynamics, solutions, acids and bases gases and nuclear chemistry with a biological application.

2.3 Generic Skills and Capabilities

For further details on the Generic Skills please refer to the Graduate Generic Skills and Capabilities policy.

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 and Capabilities		Taught	Practised	Assessed
Acquisition of discipline knowledge and skills with critical judgement		✓	✓	✓
Communication and collaboration		✓	✓	✓
Self-directed and active learning		✓	✓	✓
Creative and future thinking		✓	✓	✓
Social responsibility and ethical awareness		✓	✓	
Cultural competence and awareness in a culturally diverse environment		✓	✓	

3. Learning Resources

3.1 Required Learning Resources

Hein, M., Pattison, S., & Arena. (2015). Introduction to general, organic and biochemistry (11th ed.). Hoboken, NJ: John Wiley & Sons Inc. (ISBN: 978-1-118-41389-0)

E-Book https://www.wiley.com/en-au/Introduction+to+General%2C+Organic%2C+and+Biochemistry%2C+11th+Edition-p-9781118801994 (ISBN: 978-1-118-80199-4)

Griffith College Laboratory Manual for Chemistry of Biological Systems I. Available on the Course site.

Griffith College Lecture Notes for Chemistry of Biological Systems I. Available on the Course site.

3.2 Recommended Learning Resources

Brown T. L. (2015) Chemistry: the central science. Boston: Pearson.

John R. (2014) Chemistry companion. Queensland: Isis Publishing.

Wilson R. and Brown T. L. (2015) Solutions to exercises: Chemistry: the central science, 13th edition, Brown, LeMay, Bursten. Boston: Pearson

3.3 College Support Services and Learning Resources

The College provides many facilities and support services to assist students in their studies. Links to information about College support resources that are available to students are included below for easy reference.

Digital Library – Databases to which Griffith College students have access to through the Griffith Library Databases.

MyStudy – there is a dedicated website for this course via MyStudy on the Griffith College Portal.

Academic Integrity Tutorial - this tutorial helps students to understand what academic integrity is and why it matters. You will be able to identify types of breaches of academic integrity, understand what skills you will need in order to maintain academic integrity, and learn about the processes of referencing styles.

Services and Support provides a range of services to support students throughout their studies including personal support such as Counselling; Academic support; and Welfare support.

Jobs and Employment in the Student Hub can assist students with career direction, resume and interview preparation, job search tips, and more.

IT Support provides details of accessing support, information on s numbers and internet access and computer lab rules.

3.4 Other Information about your Learning

Attendance

You are expected to actively engage in all learning experiences and learning activities which underpin the learning content in this course. You are expected to engage with the learning content and learning activities outside of timetabled class times. This requires you to be an active agent of your learning. You are expected to bring all necessary learning resources to class such as the required textbook and /or Workbook. In addition, you are encouraged to BYOD (bring your own device) to class such as a laptop or tablet. This is not a requirement as computer lab facilities are available on campus, however, the use of such devices in the classroom is encouraged with appropriate and considerate use principles being a priority.

Preparation and Participation in Learning

In order to enhance your learning, you need to prepare before participating in the learning experiences. Absorb the learning content and complete the learning activities that are provided online before you attend the scheduled learning experiences. Make sure you complete the learning activities set each week, they are designed to support your learning. Active participation in your learning will enhance your success. Ask questions when something is unclear or when you want to bring some issue to your lecturer or tutor's attention; respond to questions to test your knowledge and engage in discussion to help yourself and others learn.

Consultation Sessions

Teachers offer extra time each week to assist students outside the classroom. This is known as ‘consultation time.’ You may seek assistance from your teacher on email or in person according to how the teacher has explained this to the class. Attendance during consultation time is optional but you are encouraged to use this extra help to improve your learning outcomes.

Course Learning Materials

Learning materials are made available to you in MyStudy on the Griffith College Portal. The learning materials are arranged in Modules. In each Module you will find the learning content, learning activities and learning experiences. Actively working your way through these course learning materials together with your lecturer or tutor will prepare you to succeed when completing the evidence of learning (assessment).

Self-Directed Learning

You will be expected to learn independently. This means you must organise and engage with the course learning content even when you are not specifically asked to do so by your lecturer or tutor. The weekly guide will be helpful to organise your learning. This involves revising the weekly course learning material and completing the learning activities. It also means you will need to find additional information to evidence your learning (assessment) beyond that given to you, and to construct your own response to a question or topic. All of this requires careful planning of your time. Expect to spend, on average, at least 10 hours per week including class time for each of your courses.

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 [please see Griffith College Policy Library - Program Progression Policy - for more information].

Teacher and Course Evaluation

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 via Griffith College's evaluation tool whenever these are available.

4. Learning Content, Learning Activities and Learning Experiences

4.1 Modules for Learning and Weekly Learning Content, Learning Activities and Learning Experience

	Learning Content 	Learning activities 	Learning experiences 	Evidence of learning 	Learning outcome 
	Module 1				
1	Measurements	Mini lectures YouTube Portfolio part 1	Introduction to portfolio; Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		1
2	Atoms and Elements	Mini lectures YouTube Virtual lab measurements Portfolio part 1	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		1
3	Atomic Theory, Naming	Mini lectures YouTube Portfolio part 1	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises	Portfolio Part 1 Quiz	1
4	Chemical Bonds, Solubility and Molecular Geometry	Mini lectures YouTube Portfolio part 1	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		1
5	Composition of Compounds and Chemical Equations	Mini lectures YouTube Virtual lab Cation Anion solubility, naming and Lewis	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises	Portfolio Part 1 Measurements, Atoms & elements Naming & balancing	1
	Module 2				

6	Redox, Calculations from Chemical Equations (Stoichiometry)	Mini lectures YouTube Virtual lab Redox Portfolio part 2	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		2
7	Properties of Liquid and Solution	Mini lectures YouTube Portfolio part 2	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises	Module 1 Quiz	2
8	Acids, Bases and Salts	Mini lectures YouTube Virtual lab pH Portfolio part 2	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		2
9	Acids, Bases and Salts Chemical Equilibrium, Acid-Base Equilibrium	Mini lectures YouTube Portfolio part 3	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises	Portfolio part 2 - Redox- in Biological systems Stoichiometry and yield in drug synthesis & Quiz	2
10	Chemical Equilibrium, Acid-Base Equilibrium	Mini lectures YouTube Portfolio part 3	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		2
11	Acid-Base Equilibrium Gaseous State of Matter	Mini lectures YouTube Virtual lab gas Portfolio part 3	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises		2
12	Nuclear Chemistry Review Module 2	Mini lectures YouTube	Lecture notes activities; Discussion groups; Workshop questions; Weekly exercises	Portfolio Part 3 Glucose concentration in Drinks & pH in biological systems & Quiz	2
Exam Week				Final exam 45% test second half of content	2

5. Evidence of Learning (Assessment Plan)

5.1 Evidence of Learning Summary

	 Evidence of learning	 Weighting	 Learning outcome	 Due Date
1	Module 1 Quiz	15%	1	7
2	Portfolio	40%	1-2	3, 9, 12
3	Final Exam *- Students must obtain at least 40% on this assessment to pass this course*	45%	2	Exam week

5.2 Evidence of Learning Task Detail

- **Module 1 Quiz**

  Rationale: This quiz is intended to test the student's understanding, interpretation and application of the chemical principles studied and developed in module 1.

  Assessment strategy: this exam will consist of multiple-choice questions and short answer questions.

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

- **Pebblepad Portfolio**
  The Pebblepad Portfolio for this course provides students the opportunity to collect evidence of learning all through the trimester. This portfolio will be carried through to Chemistry of Biological Systems II where the work collected will be re-applied.
  The portfolio is divided in 3 parts, worth 3% each. There will be 3 submission points in weeks 5, 9 & 12. The portfolio will also include 3 online quizzes worth 10% each and a reflection piece where students link the knowledge together. This can be in the form of a short video, blog, podcast. Students will be collecting evidence of learning through various tasks where they need to apply their chemistry knowledge in the biological sense. One per cent (1%) will be allocated towards the design of the Pebblepad portfolio.

  Part 1: Individual task. Students will be applying their knowledge as follows:
  - Measurements in drug dosage and body mass
  - Metals and non-metals in Coral chemistry and broken bones
  - Nomenclature and balancing chemical equation in air pollutant and biological messenger

  Part 2: Individual task. Students will be applying their knowledge as follows:
  - Redox in various Biological Systems
  - Stoichiometry and yield calculation in drug synthesis

  Part 3: Group task & individual task. Students will be applying their knowledge as follows:
  - Solutions and quantitative composition of compound calculations: Glucose concentration in two popular drinks. Students will have to calculate the concentration of glucose in g/100 mL and take pictures of what the quantity calculated would look like. Students will have to write a reflection based on their calculations and research and advice of the health implications of these drinks. Group task.
  - Acids & Bases theory and calculations in the biological system. Individual task.

  Portfolio online quizzes (3×) contain self-assessment activities and will test the students' knowledge and understanding of the course material. These quizzes are linked with the material covered in the virtual labs. All quizzes will consist of multiple-choice questions and short response questions which will be marked against moderated model answers.

- **End-of trimester exam Module 2**

  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 Module 2.

  Assessment strategy: The end-of-trimester exam will consist of multiple-choice questions (50%) and short answer questions (45%).

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

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

Requirements to pass this course:

In addition to meeting the laboratory requirements, students must:

1. **attend and attempt all assessment items; AND**

2. **obtain at least 40% in the final exam, AND**
3. **achieve an overall course result (sum of all assessments) of at least 50%**

5.3 Late Submission

An evidence of learning (assessment) item submitted after the due date, without an approved extension from the Course Coordinator, will be penalised. The standard penalty is the reduction of the mark allocated to the assessment item by 5% of the maximum mark applicable for the assessment item, for each working day or part working day that the item is late. Evidence of learning items submitted more than five working days after the due date are awarded zero marks.

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

5.4 Other Information about Evidence of Learning

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.

Requests for extension

To apply for an extension of time for an evidence of learning item, you must submit an Application for Extension of Assignment form to your teacher at least 24 hours before the date the assignment 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. Griffith College Student Medical Certificate]. Please refer to the Griffith College website - Policy Library - for guidelines regarding extensions and deferred assessment.

Return of Evidence of Learning Items

1. Marks awarded for in-trimester evidence of learning items, except those being moderated externally with Griffith University, will be available on the Student Portal within fourteen [14] days of the due date. This does not apply to the final evidence of learning item in this course (marks for this item will be provided with the final course result).

2. Students will be advised of their final grade through the Student Portal. Students can review their final exam papers after student grades have been published. Review of final exam papers will not be permitted after the final date to enrol.

3. Marks for **all** evidence of learning items including the final exam (if applicable) will be recorded in the Moodle Course Site and made available to students through the Moodle Course Site.

The sum of your marks of evidence of learning *items in this course does not necessarily imply your final grade for the course. Standard grade cut off scores can be varied for particular courses, so you need to wait for the official release of grades to be sure of your grade for this course.*

6. Policies & Guidelines

Griffith College assessment-related policies can be found in the Griffith College Policy Library which include the following policies:

Assessment Policy, Special Consideration, Deferred Assessment, Alternate Exam Sitting, Medical Certificates, Academic Integrity, Finalisation of Results, Review of Marks, Moderation of Assessment, Turn-it-in Software Use. These policies can be accessed using the 'Document Search' feature within the Policy Library

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 an allegation of a breach of academic integrity being 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; 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 Griffith College website - Policy Library > Academic Integrity Policy

Reasonable Adjustments for Assessment – The Disability Services policy

The Disability Services policy (accessed using the Document Search' feature with the Policy Library) outlines the principles and processes that guide the College in making reasonable adjustments to assessment for students with disabilities while maintaining academic robustness of its programs.

Risk Assessment Statement

There are no out of the ordinary risks associated with this course.

Note: For all Diploma level programs, Griffith College acknowledges content derived from Griffith University.