



1. General Course Information

1.1 Course Details

Course Code:	1021SCG
Course Name:	Chemistry 1A
Trimester:	Trimester 1, 2021
Program:	Diploma of Science
Credit Points:	10
Course Coordinator:	Dr Gretel Heber
Document modified:	08/09/2020

Course Description

Chemistry is known as the central science, in that it is important to our understanding interactions that occur in all the other scientific disciplines through the study of matter, its properties, reactions and associated energies. This course introduces the fundamental terminology, concepts and methods of general chemistry. Students will explain chemical concepts and solve problems (quantitative and qualitative) involving stoichiometry, atomic and molecular structure, properties, thermodynamics and equilibrium. Fundamental concepts of matter underpin understanding and problem solving in biomolecular, biological, biotechnical, chemical, environmental, engineering, forensic, materials and medicinal sciences. Consequently, Chemistry 1A is a core course in the study of these fields. Skills that will be developed include academic language/reporting, scientific methodology and approaches, quantitative literacy, critical reasoning (explaining macro phenomena using chemical concepts), laboratory techniques and safe work practices.

Learning will be structured across five modules, as follows:

- Module 1: Basic concepts, terminology and nomenclature
- Module 2: Stoichiometry
- Module 3: Atomic and molecular structure
- Module 4: Physical chemistry
- Module 5: Equilibrium chemistry

Assumed Knowledge

BRM100 Essential Mathematics is a prerequisite for this course and must be completed successfully before you can be eligible to undertake this course.

1.2 Teaching Team

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

Name	Email
Gretel Heber	Gretel.heber@staff.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

This course will introduce core concepts, theory and experimental methods of chemistry. Students will solve conceptual, quantitative chemical and experimental problems in the fields of the chemical, physical, biological, environmental, engineering, biomolecular, health and materials sciences. The relationships between chemical and macromolecular properties of substances that we experience will be explored.



2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Develop basic chemical terminology, nomenclature and concepts and apply these to categorising, naming and analysing a fictitious compound.
2. Demonstrate competence in stoichiometric calculations and develop a multimedia resource to teach a peer, using an example from their experience (e.g. baking) or field of study (e.g. for environment, remediation of arsenic in groundwater).
3. Analyse and predict the properties of atoms and the shapes, polarity, bonding and hybridisation of a range of compounds according to Valence Shell Electron Pair Repulsion and Valence Bond theories.
4. Analyse a range of systems and processes, classifying them as spontaneous or not spontaneous and propose an explanation for the magnitude of phase change thermodynamic parameters in terms of molecular structure and intermolecular forces for water, in the context of climate.
5. Evaluate an industrially important equilibrium reaction, explaining how to maximise yields of desired product.



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

Non-programmable scientific calculator.

In trimesters with in-laboratory assignments, safety glasses, lab coat and appropriate footwear are also required for compulsory in laboratory activities. Laboratory safety glasses and lab coats can be purchased from the campus bookshop or safety supply stores.

3.2 Recommended Learning Resources

Brown, Lemay, Bursten et al. (2014) Chemistry: The Central Science (3e), Pearson*.

Griffith College 1021SCG Laboratory Manual (in trimesters running laboratories). When laboratory assignments are scheduled at Nathan, hardcopies of these Manual are available from the Campus bookshop (M09) as well as from the course site. The laboratory manual and course notes are available from the Griffith College portal. The textbook should be used in conjunction with lecture notes and other materials provided in lectures and via the course web site as a major source of detailed information about the course material. It provides detailed diagrams, illustrations and problems that should be valuable aids in your learning.

A scientific calculator is recommended for laboratory classes, learning experience and quizzes. **Graphics calculators are not permitted in any quiz or examination.**

BYO device: online quizzes will be run in Pearson and a Windows/Mac device is recommended.

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 academic advice and assignment help from Student Learning Advisors, and personal and welfare support from Student Counsellors.

[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 experiences 	Learning activities 	Evidence of learning 	Learning outcome 
Module 1					
1	Matter, terminology and nomenclature	Team problem solving questions, Lab 1, build an atom, Online mini lessons and associated activities, Lab 1	Textbook Chapter 1-2, Homework, Maths support, Lab 1,	Assignment 1	1
2	Conservation of mass, introduction to chemical quantitation (equations and the mole)	Practice problem solving questions, team work, mole carnival, online mini lessons and associated activities, Lab 2	Textbook chapters 2, 3, Formative concept check, Homework,	Assignment 1	1
Module 2					
3	Stoichiometry, empirical formulae, solutions.	Online mini lessons; Practice problem solving, PhEt cheese sandwich, Lab 3	Textbook chapters 3, 4, Homework,	Assignment 2 including hurdled quiz	2





4	Solution stoichiometry, special reaction equations.	Practice problem solving, peer teaching, PhEt molarity, Peer presentation, quiz, Lab 4	Textbook chapters 3, 4, Homework, online mini lessons and associated activities	Assignment 2 including hurdled quiz	2
Module 3					
5	Atomic structure (electronic structure of atoms), periodic properties	Practice ChemTube3D, falstad atom viewer, Kahoot	Textbook chapter 6,7, Homework, online mini lessons and associated activities	Assignment 3	3
6	Bonding and molecular structure (VSEPR, VBT, MOT)	Practice problem solving, molview, online mini lessons and associated activities, Kahoot	Textbook chapters 8, 9, Homework,	Assignment 3	3
Module 4					
7	Gases and intermolecular forces	Practice problem solving, online mini lessons and associated activities, Gases sim, Kahoot	Textbook chapters 10, 11, Homework,	Assignment 4	4
8	Thermodynamics I (the first law)	Practice problem solving, heat capacity sim, hot and cold packs, Greenhouse effect online mini lessons and associated activities, Lab 5	Textbook chapter 14, homework,	Assignment 4	4
9	Thermodynamics II (the second law)	Practice problem solving, online mini lessons and associated activities, entropy sim, Kahoot	Textbook chapter 14; Homework,	Assignment 4	4
Module 5					
10	Introduction to equilibrium	Practice problem solving, equilibrium sim, Kahoot, online mini lessons and associated activities	Textbook chapter 16, Homework,	Assignment 5	5
11	Solutions and colligative properties	Practice problem solving, Pearson osmotic pressure activity, colligative	Textbook chapter 12, Homework,	Assignment 5	5

		properties sim, online mini lessons and associated activities			
12	Solution equilibria	Practice problem solving, Solubility sim, online mini lessons and associated activities, acid base sim	Textbook chapter 12, Homework,	Assignment 5	5



5. Evidence of Learning (Assessment Plan)

5.1 Evidence of Learning Summary

	 Evidence of learning	 Weighting	 Learning outcome	 Due Date
1	Laboratory Reports, including PebblePad reflections (lab reports: 20 marks; PebblePad reflections: 5 marks). <u>Students must pass this assessment with a mark of at least 12.5 out of 25 to pass the course.</u>	25%	1, 2, 4	Progressive 1-12
2	Assignment 1	5%	1	Week 3
3	Assignment 2, includes quiz (10% of final grade) Students must obtain at least 50% in this quiz in order to pass the course.	30%	2	Week 4 and 5
4	Assignment 3	10%	3	Week 7
5	Assignment 4	15%	4	Week 9
6	Assignment 5	15%	5	Week 13

5.2 Evidence of Learning Task Detail

The below assignments for this course will all include an online competency quiz component worth 5% (excepting for Module 2, where the quiz will be worth 10%) of the final grade, respectively. **Module 2 quiz** will be online through Pearson Mastering system (access provided to students). Online quiz 2 will cover material from weeks 1-4 and students will be required to pass this in order to proceed to subsequent modules. A re-attempt of the quiz will be facilitated only after Adaptive Follow-up has been completed. Online quizzes will test your understanding of the relevant course materials and problem-solving skills.

Assignment 1: Students will be issued a fictitious compound made from fictitious atoms and will be required to use their knowledge of chemistry to ascertain whether the compound is covalent, ionic or metallic, what the most stable isotope of the respective atoms is likely to be and predict some general chemical behaviour.

Assignment 2: Students will develop a multimedia resource on stoichiometry procedures and conduct peer teaching (online or f2f) in the context of their experience (e.g. baking) or field of study (e.g. treatment of arsenic-containing drinking water for environmental). Their peer audience will contribute toward their mark using an appropriate rubric.

Assignment 3: Students will be given samples of atoms and molecules to analyse for properties and shapes in the Pearson Mastering system (provided).

Assignment 4: Students will be given systems to analyse and categorise from the viewpoint of spontaneity in the Pearson Mastering system. They will then go on to analyse the molecule water and its role in climate function from the viewpoint of molecular structure and intermolecular forces and how these relate to enthalpy and entropy.

Assignment 5: Students will analyse an equilibrium system (such as the Haber-Bosch process), looking at the role of pressure, temperature, catalysts, etc., on equilibrium position and yield. They will also provide an explanation of why conditions that favour higher equilibrium yields may not be useful industrially.

In trimesters with in-laboratory assignments, reports are pro-forma type reports in the laboratory manual, and are due before the end of the assigned laboratory session. You are required to achieve 12.5/25 in the laboratory assignments and PebblePad reflections. All experiments are compulsory and satisfactory attendance and performance is required for successful completion of the course. **Where in-laboratory assignments are not possible equivalent online virtual laboratory assignments will be provided.**

PebblePad reflections will be completed in the week following the respective laboratory using the provided PebblePad resource workbook. The PebblePad reflections themselves will be worth 5% of the total grade.

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 Sitings](#), [Medical Certificates](#), [Academic Integrity](#), [Finalisation of Results](#), [Review of Marks](#), [Moderation of Assessment](#), [Turn-it-in Software Use](#). These policies can be accessed 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 within 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.

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