



Course Code:	1021SCG
Course Name:	Chemistry 1A
Trimester:	Trimester 2, 2019
Program:	Diploma of Science
Credit Points:	10
Course Coordinator:	Dr Gretel Heber
Document modified:	14 June 2019

### Teaching Team

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

Name	Email
Dr Gretel Heber	<a href="mailto:Gretel.Heber@staff.griffithcollege.edu.au">Gretel.Heber@staff.griffithcollege.edu.au</a>
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### 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.

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## Prerequisites

>70% in the Maths Ready quiz or successful completion of Essential Maths (BRM100) is pre-requisite for enrolling in Chemistry 1A (1021SCG).

Please note: 1021SCG is a prerequisite for 1022SCG. This means that you need to achieve a Pass or above to progress to this course.

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## Brief Course Description

This course introduces the fundamental concepts and methods of general chemistry. Basic skills of laboratory chemical analysis are developed.

Lecture contents include four units:

- [1] Introduction and basic concepts
  - [2] Structure and bonding
  - [3] Thermodynamics and physical processes
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## Rationale

Chemistry is known as the central science, in that it is important to our understanding of interactions that occur in all the other scientific disciplines through the study of matter; its properties, reactions and associated energies. 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 .

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## Aims

Chemistry involves study of the properties and behaviour of matter and energy. Matter is defined as anything that has mass and occupies space.

Matter is anything that has mass and occupies space and in the context of chemistry the focus is the atom, molecules and structures and their properties. It has been shown that all the matter in our universe arises due the combination of about 100 basic substances called elements, and the elements themselves are made of smaller units called atoms. Energy is a measure of the capacity to change, which in chemistry focusses on chemical reactions and processes. The purpose of this course is to introduce students to the study of matter, its interactions and energetics, as follows:

1. Introduce core concepts, theory and experimental methods of chemistry;
  2. Encourage and equip students to solve conceptual, quantitative chemical and experimental problems in the fields of the chemical, physical, biological, environmental, engineering, biomolecular, health and materials sciences;
  3. Demonstrate how chemical properties influence the macromolecular properties of substances that we experience; and
  4. Provide fundamental chemical knowledge and skills required in studies of science and related fields.
  5. Engage students in chemistry, chemical problem solving and applications.
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## Learning Outcomes

Upon successful completion of this course students will be able to...

1. Identify, explain and apply chemical concepts (stoichiometry, molecular structure and physical chemistry) at the molecular and macroscopic levels;
  2. Demonstrate competence in basic experimental chemistry techniques and apply safe working practices in the laboratory;
  3. Demonstrate effective critical reasoning skills and knowledge of chemical concepts to solve quantitative and conceptual problems and evaluate chemical data in a variety of contexts;
  4. Reflect on learning competencies and skills and how these may be utilised in their future studies and career..
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## Texts and Supporting Materials

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

Lecture notes and supplementary material will be available on the 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.

1021SCG Chemistry 1A Laboratory Manual available from campus bookstore, Mt Gravatt campus.

Lab Coat and Safety Glasses must be purchased (from the campus bookshop or elsewhere)

and be brought to every laboratory class. Repeated failure to bring laboratory manuals, safety glasses and/or lab coats will result in loss of marks.

Scientific calculator is required for laboratory classes, workshops, workshop quizzes, tutorials and exams. **Graphics calculators are not permitted in any workshop quiz or examination.**

### **Web Sites & Literature References:**

The course Web site is available via Griffith College Portal. The Portal and email will be used by the convenor as the main means of communicating information to you about the running of the course e.g workshop quiz results, any timetable changes etc consult your email and the Griffith College Portal regularly.

Links to other sites are provided on the course site and also in the Study Guide. Your lecturer may provide further resources such as recommended literature references and other useful Web sites and these are to be used to further develop your understanding of particular topics.

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### **Organisation and Teaching Strategies**

The teaching and assessment portion of the trimester is of 12 weeks duration - inclusive. The course consists of 4 Modules and a Laboratory Component.

### **MODULES TOPICS TEACHING & LEARNING ACTIVITIES**

Module 1 Weeks 1 - 4 Basic chemical concepts: 12 hr lectures, 4 tutorials, 4 workshops,

Module 2 Weeks 5 - 7 Atomic and molecular structure: 9 hr lectures, 3 tutorials, 3 workshops,

Module 3 Weeks 8 - 11 Thermodynamics and physical processes: 12 hr lectures, 4 tutorials, 4 workshops,

Weeks 1- 12: Laboratory assignments, as timetabled.

Week 12 will be reserved for revision of the course content covered from week 1 to week 11.

**PLEASE NOTE:** Lab classes for this course will be 4 hours each over five weeks in room N44\_3.16A (Nathan Campus). Experiments in laboratory safety and procedures, basic chemical analyses, descriptive chemistry, titration and thermodynamics will be provided.

The Course is taught using a variety of teaching and learning activities including lectures, and intensive, facilitated workshops, tutorials and laboratory activities. Course material will be presented in three (3) Learning Modules as detailed above.

The Teaching and Learning Activities used in the different modules are

### **Lectures:**

For each module, lecture classes will be provided highlighting the main points covered by the module topics and explaining the key concepts developed in the module. Approaches to problem solving are modelled. Detailed content is provided by the Textbook and other sources. The purpose of the lectures is to explain and discuss concepts based on the

knowledge of content. To gain maximum benefit from the lectures you should have some general knowledge of that content before participating in the lecture class.

**Tutorials:**

During tutorials, problem solving approaches will be modelled and group participation is required. Tutorials will focus on conceptual hurdles and challenging material for the course. You are expected to attempt the focus tutorial questions before the tutorial.

**Workshops:**

Workshops help to develop further understanding of course content through discussion of relevant topics and examples using a problem solving approach.

**IMPORTANT:**

To gain the most from this course, attendance at all tutorials and workshops is strongly advised.

**Laboratory:**

Lab classes for this course will be 4 hours each over five weeks in room N44\_3.16A (Nathan Campus) as denoted in your timetable. **It is essential that the first lab is undertaken** in order to proceed to successive labs. These laboratory sessions will be held on the Nathan campus of Griffith University, N44\_3.16A - attendance and participation in all 5 laboratory classes is a requirement for achieving a pass in this subject. Further details will be provided during class time. **Laboratory assignments cannot be deferred.**

Where class times conflict with Public Holidays, makeup classes may be organised on a different day. You are advised to make inquiries about these Public Holidays to determine when the relevant class will be held. Further time is made available for individual consultation with teaching staff each week [see myTimetables>Consultation for further details].

*Class Contact Summary***Attendance**

Attendance is expected at all class activities during the trimester. Your attendance in lectures, tutorials, workshops and labs will be recorded twice during each class. To receive full attendance, you must be present in the classroom on both occasions.

**Participation in Class**

You are expected to have pre-read the lecture notes and relevant chapters in the textbook before coming to lectures each week and to actively participate in all class activities. A device for internet access in class is recommended. Focus tutorial questions should be attempted BEFORE the scheduled tutorial class.

**Consultant Times**

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

**Course Materials**

Before attending the weekly lectures, you are expected to prepare in advance for each of these classes by pre-reading the lecture notes and the relevant chapters in the textbook and undertaking assigned tutorial and homework problems.

### **Laboratory Sessions**

Punctuality is always important but especially so for the laboratory classes. It is important that you arrive prepared for each laboratory session and are ready to start at the time given in the timetable. Failure to arrive within 10 minutes of the commencement of the scheduled laboratory time and/or prepared (with required equipment) will result in a loss of marks as a minimum and possible exclusion from that lab session. If you are excluded from the lab you will be marked absent from the entire laboratory session. Deferral of laboratory assignments is not possible.

Preparation for lab sessions involves reading through the relevant chapters in the laboratory manual and completing pre-lab exercises. You are required to purchase a copy of the laboratory manual, a laboratory coat and safety glasses you are responsible for bringing your lab coat, safety glasses and wearing appropriate footwear that covers the whole foot. Marks will also be deducted for failure to come adequately prepared.

You are also required to complete an online laboratory induction through [learning@griffith](mailto:learning@griffith) prior to the first laboratory session.

### **Independent Learning**

You are also expected to undertake a minimum of 6-7 hours each week (in addition to the 6 hours of contact time) in undertaking learning and project activities related to this course.

### **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].

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### **Content Schedule**

The following topics will be covered throughout the trimester:

#### *Weekly Teaching Schedule*

**PLEASE NOTE: Lab classes for this course will be in room N44\_3.16A at Nathan campus, as detailed in your timetable.**

Week	Topic	Activity	Reading
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1	Module 1: Matter, atoms and molecules (basic structure and terminology)	Lecture	Textbook Chapter 1-2
	Numeric skills for Chemistry	Workshop	
2	Module 1: nomenclature, equations, , the mole.	Lecture	Textbook chapters 2, 3
	Matter, atoms and molecules	Tutorial	Tutorial number 1
3	Module 1: Chemical reaction stoichiometry, empirical formulae, solutions.	Lecture	Textbook chapters 3, 4
	Nomenclature, equations, formulae, the mole.	Tutorial	Tutorial number 2
4	Module 1: Chemical stoichiometry, special reaction equations.	Lecture	Textbook chapters 3, 4
	Stoichiometry	Tutorial	Tutorial number 3
	Module 1	In-class quiz 1	
5	Module 2: atomic structure (electronic structure of atoms)	Lecture	Textbook chapter 6
	Reactions and stoichiometry	Tutorial	Tutorial number 4
6	Module 2: Periodic properties and molecular bonding (Lewis diagrams)	Lecture	Textbook chapters 7, 8
	Atomic structure	Tutorial	Tutorial number 5
7	Module 2: Molecular bonding and structure (VSEPR, VBT, MOT)	Lecture	Textbook chapter 9, 11
	Periodic properties and molecular bonding	Tutorial	Tutorial number 6
8	Module 3: Intermolecular forces: gases	Lecture	Textbook chapter 10
	Molecular bonding and structure	Tutorial	Tutorial number 7
	Module 1/2 In-class quiz	In-class quiz 2	
9	Module 3: Intermolecular forces and properties of solutions	Lecture	Textbook chapters 11, 12
	Intermolecular forces: gases	Tutorial	Tutorial number 8
	Module 2/3	In-class quiz 3	
10	Module 3: Thermodynamics I (the first law)	Lecture	Textbook chapter 14
	Intermolecular forces and properties of solutions	Tutorial	Tutorial number 9

11	Module 3: Thermodynamics II (the second law)	Lecture	Textbook chapter 14
	Thermodynamics I	Tutorial	Tutorial number 10
12	Revision	Lecture	
	Thermodynamics II	Tutorial	Tutorial number 11
	Module 2/3	In-class quiz 3	

## Assessment

This section sets out the assessment requirements for this course.

### *Summary of Assessment*

Item	Assessment Task	Details	Weighting	Relevant Learning Outcomes	Due Date
1	In-classes quiz 1.	A mixture of multiple-choice and short answer questions will be asked on the preceding 4 weeks' material.	5%	1,3,4	4
2	In-class quizzes 2 and 3 (7% each)	A mixture of multiple-choice and short answer questions will be asked on the preceding 4 weeks' material.	14%	1,3,4	8 and 12
2	Laboratory Reports, including Pebble Pad reflections (labs worth 20 marks, Pebble Pad worth 5 marks)	Students are required to attain an overall mark of 50% (i.e. 12.5/25) in lab reports and Pebble Pad reflections	25%	2,3,4	Progressive 1-12
3	Online quiz homework (1% each)	Short online quizzes on the preceding weeks' material will be set each week.	11%	1,3,4	Progressive 2-12



4	Final Exam	The final exam will be a mixture of multiple choice and short answer questions and will cover all content. Students must pass this assessment with a mark of at least 24 out of 60 (40%) to pass the course	45%	1,3,4	14
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### *Assessment Details*

The assessment for this course consists of four online quizzes, two in-class quizzes, an end of trimester examination and a set of laboratory reports.

**The online quiz homework** will be conducted weekly throughout trimester and will be based on the preceding weeks' content. Each will be of ~30 minutes duration.

**In-class quiz 1** will be a mixture of multiple choice and short answer questions totalling 10 marks.

**In-class quiz 2 and 3** will be a mixture of short answer and multiple choice questions, totalling 16 marks .

The in-class quizzes and the end of trimester examination will be in the form of closed book written examinations. A non-programmable calculator is essential. Laboratory reports consist of completing relevant sections in the laboratory manual and Pebble Pad reflections on the laboratory assignment and tasks.

**End of trimester examinations and in-class quizzes** will test your understanding of the relevant course materials and problem-solving skills. The questions will be marked against standard solutions.

The end of trimester examination will cover course material from weeks 1-11. Students are required to gain a mark of 40% or greater in this exam to pass the course.

**Laboratory reports** will develop your scientific reporting skills and will contain questions that test your understanding of chemistry principles and laboratory skills of the practicals.  
**ATTENDANCE AND ADEQUATE PERFORMANCE AT EACH LABORATORY CLASS IS ESSENTIAL TO PASS THE COURSE.**

The laboratory component is graded by continuous assessment of the laboratory experiments and contributes 25% to the final mark. All experiments are compulsory and satisfactory

attendance and performance is required for successful completion of the course.

### *Submission and Return of Assessment Items*

Examination papers will not be returned. Marked laboratory reports will be distributed in the laboratory classes.

### **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 24 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  $\leq$  24 hours 10%
- > 24 hours and  $\leq$  48 hours 20%
- > 48 hours and  $\leq$  72 hours 30%
- > 72 hours and  $\leq$  96 hours 40%
- > 96 hours and  $\leq$  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*

Marks awarded for assessment items will also be available on the on-line grades system on the Student Website within fourteen [14] days of the due date.

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## 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			
Critical and Innovative Thinking			
Academic Integrity	Yes	Yes	Yes
Self Directed Learning			
Team Work	Yes	Yes	Yes
Cultural Intelligence			
English Language Proficiency			

### *Additional Course Generic Skills*

Specific Skills	Taught	Practised	Assessed
Chemical laboratory skills	Yes	Yes	Yes

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### Additional Course Information

In addition to formal contact hours, you are provided with extra support through individual consultation with lecturers, English language support, and self-access computer laboratories.

### **Teacher and Course Evaluations**

Students commented that the assessment items, tutorial activity and teacher's approach were positive in supporting their learning. Students particularly appreciate the examples given during lectures and the opportunity to practice calculation problems. This practice will continue to be advanced with more examples and opportunity for students to participate in lectures.

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 online evaluation tool whenever these are available.

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## 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 any allegation of academic misconduct 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 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.

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