



## 1. General Course Information

### 1.1 Course Details

<b>Course Code:</b>	1022SCG
<b>Course Name:</b>	Chemistry 1B
<b>Trimester:</b>	Trimester 2, 2022
<b>Program:</b>	Diploma of Science
<b>Credit Points:</b>	10
<b>Course Coordinator:</b>	Dr Gretel Heber
<b>Document modified:</b>	27/05/2022

### 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. Chemistry 1B extends the knowledge gained in Chemistry 1A, introducing students to concepts, experimental methodologies and problem solving in organic systems (organic molecules, their properties and reactions), physical chemistry and inorganic chemistry. Students will explain chemical concepts and solve problems (quantitative and qualitative) within the context of these modules. Fundamental concepts of matter underpin understanding and problem solving in biomolecular, biological, biotechnical, chemical, environmental, engineering, forensic, materials and medicinal sciences. Consequently, Chemistry 1B 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 three modules, as follows:

- Module 1: Organic chemistry. Topics include structure, naming, stereoisomerism, properties, reactions and spectroscopy.
- Module 2: Physical chemistry. Topics include electrochemistry, reaction kinetics and nuclear chemistry.
- Module 3: Inorganic chemistry. Topics include coordination compound (d-block) properties and naming, and p-block chemistry.

## Assumed Knowledge

1021SCG Chemistry 1A 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 teacher can be contacted via the email system on the portal.

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

## 1.3 Staff Consultation

Your teacher is available each week for consultation outside of normal class times. Times that your teacher will be available for consultation will be given during the first week of learning experiences. A list of times 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 aims to introduce students to the basic concepts, theory and experimental methods of organic, physical and inorganic chemistry, building on knowledge of physical chemistry obtained in Chemistry 1A. Thermodynamics will be extended into redox chemistry, weak acid/base chemistry and developing knowledge of chemical kinetics. Core concepts and approaches to problem solving in nuclear and inorganic chemistry will be introduced. Students will be supported to engage in chemical problem solving in a variety of contexts, including practical applications, and to extend critical analysis into their field of study and experience.



### 2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Demonstrate competence in analysing and applying of organic chemistry concepts (structure, stereochemistry, properties, reactions and analysing spectra) through an extended analysis assignment (analysis of an organic compound), competency quiz and laboratory practicals.
2. Explore and apply the quantitative and conceptual concepts of physical chemistry (redox, reaction kinetics and nuclear chemistry) through an extended response assignment (environmental, corrosion, sensor development) and competency quiz and laboratory practicals.
3. Explore and apply the concepts of inorganic chemistry (transition metal complexes and p-group chemistry) through an extended response assignment (analysing a transition metal complex in a natural system e.g., metalloproteins), competency quiz and laboratory practicals



## 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 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 1022SCG Laboratory Manual (in trimesters with in-laboratory assignments).

Hardcopies of these resources are available from the Campus bookshop (M09). The laboratory manual and course notes are available from the Griffith College portal. The textbook should be used in conjunction with the notes and other materials provided in learning experiences 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 sessions, and quizzes.

**Graphics calculators are not permitted in any workshop quiz or examination.**

BYOD: Windows/Mac device for online quizzes and learning experience activities.

### 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.

Griffith College is committed to ensuring academic integrity is understood and maintained by all staff and students. All students learn about academic integrity through engagement with the weighted Epigeum modules within the suite of Academic and Professional Studies courses.

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.

#### **Laboratories**

Attendance and participation in **ALL** the Laboratory sessions is **COMPULSORY**. Attendance and participation will be recorded.

#### **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 teachers 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 Learning Content, Learning Experiences and Learning Activities. **Learning Content** will be engaged with prior to the scheduled **Learning Experience (your weekly class)**. This will ensure you are prepared for the scheduled Learning Experience by being aware of the content to be covered and therefore will be able to actively participate in the session. **Learning Activities** are accessed after the scheduled session for purposes of review, consolidation of learning, and preparation for the Evidence of Learning tasks (assessment) in the course.

In addition, **Anytime Anywhere** learning material is provided in the course. This learning material provides support, interactive tools and directions for students who occasionally cannot attend the weekly scheduled Learning Experience (either in person or on Zoom) perhaps due to illness or other commitments. The Anytime Anywhere learning material should also be used in conjunction with Learning Content and Learning Activities resources.

## 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 teacher. 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 teachers. You are encouraged to provide your thoughts on the course and teaching, both positive and critical, directly to your teacher or by completing course and teaching 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 
	<b>Module 1</b>				
<b>1</b>	Functional groups and nomenclature	Online mini lessons and associated activities, team practice problems,	Course notes Textbook: 22, 24 – 29, Homework, assignment,	Assignment 1	<b>1</b>





		molecule building with Molview			
<b>2</b>	Stereochemistry and arenes	Online mini lessons and associated activities, team practice problems, chemtube3D and molview	Textbook ch. 23, 28, class notes, Homework, assignment, online mini lessons and associated activities	Assignment 1	<b>1</b>
<b>3</b>	Organic properties, nucleophiles and electrophiles, reactions (electrophilic Markovnikov addition)	Online mini lessons and associated activities, team practice problems, Molview, Chemtube3D, Lab 1	Textbook ch. 17-18, 24, 27, class notes, Homework, assignment, online mini lessons and associated activities,	Assignment 1	<b>1</b>
<b>4</b>	Organic reactions continued (nucleophilic addition, nucleophilic substitution, electrophilic substitution, esterification, redox)	Online mini lessons and associated activities, team practice problems, chemtube3D and molview, Lab 2	Textbook ch. 25-28; class notes, Homework, assignment,	Assignment 1	<b>1</b>
<b>5</b>	Spectroscopy: FTIR, Mass spectrometry, NMR, UV/Vis spectroscopy	Online mini lessons and associated activities, collaborative 'chemical detective', NMR Predict, Padlet escape room Lab 3	Textbook ch. 30 and class notes, Homework, assignment,	Assignment 1	<b>1</b>
<b>Module 2</b>					
<b>6</b>	Electrochemistry (galvanic cells, cell potentials, Nernst equation)	Online mini lessons and associated activities, team practice problems, build your own electrochemical cell simulation.	Textbook ch. 19, homework, assignment,	Assignment 2	<b>2</b>
<b>7</b>	Reaction kinetics (Rate laws, orders, initial rates, mechanisms)	Online mini lessons and associated activities, team practice problems, PhET atmospheric reactions, Lab 4	Textbook ch. 15 and class notes, , homework, assignment,	Assignment 2	<b>2</b>
<b>8</b>	Nuclear chemistry	Online mini lessons and associated activities, team practice problems, PhET radioactive dating game	Textbook ch 5 and class notes, homework, assignment,	Assignment 2	<b>2</b>
<b>Module 3</b>					
<b>9</b>	Transition metal complexes I (ligands, oxidation state, electron configuration, naming)	team practice problems, Lab 5, Chemtube 3D	Textbook ch 21 and class notes, homework, assignment,	Assignment 3	<b>3</b>
<b>10</b>	Transition metal complexes II	Online mini lessons and associated	Textbook ch 21 and class notes,	Assignment 3	<b>3</b>

	(stereoisomerism, CFT for $O_h$ complexes, applications)	activities, team practice problems, Pearson visualising complexes	homework, assignment,		
<b>11</b>	p-block chemistry (groups 14 to 17)	Online mini lessons and associated activities, team practice problems	Textbook ch 20 and class notes, homework, assignment,	Assignment 3	<b>3</b>
<b>12</b>	Inorganic chemistry in biological systems (bioinorganic chemistry)	Online mini lessons and associated activities, team practice problems, cisplatin equilibrium calculations	Textbook ch 20 and class notes, homework, assignment,	Assignment 3	<b>3</b>



## 5. Evidence of Learning (Assessment Plan)

### 5.1 Evidence of Learning Summary

	 Evidence of learning	 Weighting	 Learning outcome	 Due Date
<b>1</b>	Laboratory Assignments (a) Laboratory reports (b) Pre-laboratory assignments  <i>- Students must pass this assessment with a mark of at least 15 out of 30 (50%) to pass the course</i>	20% 5%	<b>1-3</b>	Progressive 1-12
<b>2</b>	Module 1 Assessment	35%	<b>1</b>	7
<b>3</b>	Module 2 Assessment	15%	<b>2</b>	10
<b>4</b>	Module 3 Assessment	25%	<b>3</b>	13

### 5.2 Evidence of Learning Task Detail

#### 1.Evidence of Learning Task 1: Laboratory Assignments (25%)

**Task Type:** Practical Assignment – Written Assignment

**Due Date:** As timetabled

**Weight:** 25%, Marked out of 25

**Length:** 20 hour

**Task Description:** Students undertaken five laboratory assignments and write laboratory reports.

**Criteria and Marking:** Students are assessed on their practical skills, understanding and communication

skills

**Submission:** face to face written assignment, completed during lab.

## **2.Evidence of Learning Task 2: Module 1 Assessment (35%)**

**Task Type:** Assignment – Written Assignment (20%); quiz (10%); online homework (5%)

**Due Date:** week 7

**Weight:** 10% quiz, 5% homework, 20% assignment%, Marked out of: 25 (quiz), 5 (homework), 20 (assignment)

**Length:** 75 mins

**Task Description:** Students demonstrate their understanding of the module content through answer quiz questions and analysing an organic molecule of their choice for chemical properties, stereochemistry, reactions and spectral interpretation

**Criteria and Marking:** Students are assessed on the Assignment rubric, Pearson Mastering

**Submission:** Turnitin via the course site; online Pearson quiz/homework

## **3.Evidence of Learning Task 3: Module 2 Assessment (15%)**

**Task Type:** Assignment – Written Assignment (10%); quiz (5%)

**Due Date:** week 10

**Weight:** 10% Assignment, 5% quiz, Marked out of 10 (assignment), 12 (quiz)

**Length:** 1 hour

**Task Description:** Students pick one of the offered scenarios and adapt content knowledge to answer questions. Both quantitative and conceptual knowledge are assessed.

**Criteria and Marking:** Students are assessed on conceptual knowledge and quantitative proficiency.

**Submission:** Turnitin via the course site; Pearson online quiz

## **4.Evidence of Learning Task 4: Module 3 Assessment (25%)**

**Task Type:** Assignment – Written Assignment (15%); Online quiz (10%)

**Due Date:** week 13

**Weight:** 15% Assignment, 10 % quiz, Marked out of 15 (Assignment), 25 (quiz)

**Length:** 1.5 hours

**Task Description:** Students apply concepts from the content to a metalloprotein (assignment) and answer quiz questions.

**Criteria and Marking:** Students are assessed on Assignment rubric (explanation of the structure, function and energetics of a metalloprotein coordination compound) and Pearson Mastering quiz.

**Submission:** Turnitin via the course site; online Pearson quiz

**Laboratory Assignment (25%):** In trimesters where in-laboratory assignments are not conducted, an equivalent online virtual laboratory assignment will be provided. Students must complete **ALL laboratory assignments** and gain an overall pass of 12.5/25 on the Laboratory component, including pre-laboratory assignments, in order to pass the course.

**Module 1 Assessment (35%):** An online competency quiz component of this assignment will be completed in Pearson (10% of final grade). In addition, students will choose an important organic chemical in their field of study/interest and produce a multimedia presentation, in the format of their choice, to be presented to their classmates. They will analyse the functional groups present, molecular geometry, and predict properties based on structure and support this with research, provide two reactions that the substance would undergo and provide a spectroscopic analysis of key FTIR and <sup>1</sup>H NMR excitations. Reactions should be in the context of preservation for desired substances and degradation for undesired substances. Students must explain how properties are analysed (i.e. for an organic with chiral centres show how they identified it).

**Module 2 Assessment (15%):** An online competency quiz component of this assignment will be completed in Pearson (5% of final grade). In addition, students will utilise their physical chemistry knowledge by selecting a topic from a list for analysis on the basis of redox properties, kinetics, and/or nuclear chemistry (such as tracer studies). e.g. corrosion, environmental pollution/atmospheric chemistry, sensors. Note: Kinetic electrochemistry (voltammetry) is beyond the scope of this course.

**Module 3 Assessment (25%):** An online competency quiz component of this assignment will be completed in Pearson (10% of final grade). In addition, students will analyse a metalloprotein complex for oxidation state, coordination number, magnetism, CFT and spectroscopic (colour) properties and how these might be exploited in the context of analysis/sensors or industrially e.g. heme complex.



## Requirements to pass this course:

students must:

1. **attend and attempt all assessment items; AND**
2. **obtain at least 50% on the lab component, 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 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 teachers 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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