1. General Course Information

1.1 Course Details

Course Code:	1004GRC
Course Name:	Computing and Programming
Trimester:	Trimester 1, 2025
Program:	Diploma of Engineering
Credit Points:	10
Course Coordinator:	Dr Andrew Wixted
Document modified:	18/08/2024

Course Description

This course introduces students to common computer software packages and develops their computing skills. The course introduces students to basic data analysis and numerical modelling techniques, and prepares students to solve engineering problems using off-shelf computer packages and software. This course includes project-based learning involving laboratory measurement.

Assumed Knowledge

There are no prerequisites for this course

1.2 Teaching Team

Your teacher/s can be contacted via email as below:

You will also find their email in the Teacher's tile on your Course Site.

Name	Email
Dr. Andrew Wixted	andrew.wixted@griffithcollege.edu.au

1.3 Meet with your teacher

Your teacher is available each week to meet outside of normal class times. This is called consultation. Times that your teacher will be available for consultation will be found on the Teacher's tile on your Course Site.

1.4 Timetable

Your timetable is available on the Griffith College Digital Campus at My Apps, Timetable.

1.5 Technical Specifications

All students must have access to a computer or suitable mobile device such as laptop or tablet (mobile phones are not suitable). In addition, up-to-date browser access, a reliable high-speed internet connection with enough upload and download capacity, a webcam and headset including microphone may be needed.

2. Aims, Outcomes & Generic Skills

2.1 Course Aims

The computer has become one of the most widely used tools in the modern world, and has a profound impact on how engineering and science are practiced today. The goal of this course is to familiarise students with the software environment in a modern computing system, and to introduce the fundamentals of computing that apply to programming languages, to solve various engineering problems.

This is one of the foundation courses required by other courses later in the Bachelor of Engineering (Honours) in Civil, Mechanical and Environmental majors where numerical computing becomes an integral part of the simulation/design methodology. This course develops fundamental skills in problem conceptualization, formulation, and solution in one of the most powerful and versatile programming environments - Python.

2.2 Learning Outcomes

After successfully completing this course you should be able to:

1. Acquire numerical computing skills using a platform suitable for solving engineering problems.
2. Formulate engineering problem statements, identifying assumptions and simplifications, and translate them to computer problems.
3. Develop computer programs to solve fundamental problems, validate the program and evaluate its accuracy.
4. Analyse the results from engineering perspectives, such as for engineering design or decision-making.
5. Develop the capacity to collaborate with team members effectively, and report and present engineering outcomes in a professional format.

2.3 Graduate Capabilities and Employability Skills

For further details on the Graduate Capabilities and Employability Skills please refer to the Graduate Generic Skills and Abilities Policy

Griffith College is committed to producing graduates who are able to demonstrate progress toward the development of a number of generic skills / capabilities that will allow them to successfully continue their studies at the tertiary level. This set of skills includes employability related skills that will ensure graduates are capable in the workplace of the future.

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

Graduate Capabilities and Employability Skills			Focus within this course
Interacting with People	Teamwork		
	Communication		✓
	Respect for Culture and Diversity		
Readiness for the Workplace	Problem Solving		✓
	Planning and Organisation		
	Creativity and Future Thinking		

3. Learning Resources

3.1 Required Learning Resources

- Tony Gaddis, Starting Out with Python, 2021.
- Python documentation: https://www.python.org/doc/
- Math libraries: https://docs.python.org/3/library/math.html
- NumPy user guide: https://numpy.org/doc/stable/user/index.html
- Matplotlib 3.5.2 documentation: https://matplotlib.org/stable/index.html

3.2 Recommended Learning Resources

- David Schneider Introduction to Programming Using Python, Student Value Edition, 2015
- Please refer to the course webpage for other learning resources.

3.3 College Support Services and Learning Resources

Griffith College provides many facilities and support services to assist students in their studies. Links to information about 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.
- Study Toolbox – there is a dedicated website for this course on the Griffith College Digital Campus.
- Academic Integrity - 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 Academic Integrity online modules within the Academic and Professional Studies course.
- 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

Preparation and Participation in Learning

You need to prepare before attending your scheduled Learning Experience (In Class). Work through the Learning Content (Before Class) prepared by your teacher which is found on the course site. Make sure you complete the Learning Activities (After Class) set each week. 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 teacher's attention; respond to questions to test your knowledge and engage in discussion to help yourself and others learn.

Attendance

You are expected to actively engage in all learning experiences which underpin the learning content in this course. Attendance will be recorded by your teacher in each learning experience to ensure you are meeting the requirements of the program you are studying and/or your visa conditions. You are expected to engage with the learning content and learning activities outside of timetabled class times. You are expected to bring all necessary learning resources to class such as the required textbook and /or Workbook.

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 via 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 the course site. The learning materials are arranged in Modules. In each Module you will find Learning Content (Before Class), Learning Experiences (In Class) and Learning Activities (After Class). **Learning Content (Before Class)** will be engaged with prior to the scheduled **Learning Experience (In Class)**. This will ensure you are prepared for the scheduled Learning Experience (In Class) by being aware of the content to be covered and therefore will be able to actively participate in the session. **Learning Activities (After Class)** are accessed after the scheduled session for purposes of review, consolidation of learning, and preparation for the Evidence of Learning Tasks (Assessments) in the course.

Self-Directed Learning

You will be expected to learn independently. This means you must organise and engage with the course Learning Content (Before Class) even when you are not specifically asked to do so by your teacher. The weekly guide (below) will be helpful to organise your learning. This involves revising the weekly course Learning Content (Before Class) and completing the Learning Activities (After Class). It also means you will need to find additional information to evidence your learning 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%, students are engaged in their learning 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].

International students enrolled in Language Development Modules (LDM100 / LDM200 or LDH100 / LDH200)

Successful completion of LDM100 and LDM200 or LDH100 and LDH200 is **required** to graduate with your Diploma award and progress to your Bachelor. If you do not achieve non-graded passes for these language modules your progression to your Bachelor will be affected. Please attend all your classes and submit your assessment.

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

4. Weekly Guide: Learning Content, Learning Experiences and Learning Activities

The information below lays out how your learning will be organised throughout the trimester.

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

Week	Learning Content (Before Class)	Learning Experiences (In Class)	Learning Activities (After Class)	Evidence of Learning (Assessment)	Learning Outcome
					
	Module 1: Introduction to calculation and programming in Python				
1	Overview of computing and programming basics Basics and simple problem solving	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum		1
2	Data manipulation and management Matrices and data manipulation	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2
3	Programming logic and selection structure	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3
	Module 2: Structured statements and matrices in Python				
4	Repetition structure and numerical integration Plotting	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities In Class Quiz 1	1,2,3,4

5	Selection and repetition structures Plotting	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3,4
6	Repetition structure and advanced problem solving	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3,4
7	Matrix Algebra	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	In Class Quiz 2	1,2,3,4,5
8	User defined functions	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3,4
	Module 3: data analysis and advanced problem solving in Python				
9	Analysing data statistically 1	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3,4
10	Analysing data statistically 2 Curve fitting for engineering analysis	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	In-lab test	1,2,3,4,5
11	Advanced engineering problem solving Differential Equations	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3,4
12	Advanced topics and Revision	Weekly activity Programming tutorial	• Online tutorial • Workshop • Discussion forum	Weekly activities	1,2,3,4

4.2 Practical Laboratory Classes

Tutorial sessions include practical coding sessions. Topics are detailed in 4.1 Weekly Learning Content, Learning Experiences and Learning Activities. Please look out for the timetable details.

5. Evidence of Learning (Assessment)

5.1 Evidence of Learning Summary

	Evidence of Learning (Assessment)	Weighting	Learning Outcome	Due Date
1	Academic development holistic assessment Computer exercise attendance & practice (x9)	18%	1, 2, 3,4	Weeks 2-6, 8, 9, 11 and 12 During weekly classes
2	Quiz 1	7%	1,2	Week 4 During Week 4 class
3	Quiz 2	10%	1,2	Week 7 During Week 7 class
4	Academic development holistic assessment In-lab test	20%	2,3	Week 10 During Week 10 class
5	Exam - selected and constructed responses Final Exam	45%	1, 2,3	Week 13 During the exam week

5.2 Evidence of Learning Task Detail

You are required to **submit your own work** for marking. All planning, notes and drafts need to be retained so they can be presented to your teacher if requested.

Please note that generative artificial intelligence (GenAI) applications are **not permitted** to be used for assessment content creation, translation or extensive language assistance unless specifically identified in the assessment guidelines. Where permission is given for the use of GenAI applications for assessment content creation, appropriate referencing must occur.

Students should follow all teacher directions about the use of Generative Artificial Intelligence (GenAI) tools in relation to formative and summative assessment tasks (including how to cite GenAI tools, if relevant). It should be noted that Turnitin provides teaching staff with a GenAI percentage indicator as well as an Originality Report which detects plagiarism.

1. Evidence of Learning Task 1: Computer exercise attendance & practice (18%)

Type: Academic development holistic assessment
Learning Outcomes Assessed: 1, 2, 3, 4
Due Date: at the end of each computer exercise session (9x).
Weight: 18%
Marked out of: 18
Task Description:

The computer exercise sessions are designed to introduce students to the fundamentals of the programming language as well as familiarise them with all computing skills, and provide the necessary scaffolding for the design projects including problem formulations and model validations from simple to more complicated civil/environmental engineering problems. The completed work will be submitted online for assessment. There are 9 sessions (**Weeks 2-6, 8, 9, 11 and 12**) in total. **Week 10 lab session will be in lab test**.

Criteria & Marking:

Attendance and effort at each enroled laboratory session
High quality and correct algorithm design to solve assigned problems.
Students can receive feedback (within two weeks) on their assessment items through the labs, or by arranging an appointment with the appropriate teaching staff.
Any such request must be arranged before the final examination.
Submission: Submit online at the end of each computer lab

This assessment item:

- is a school based activity
- is an individual activity
- does not include a self assessment activity

2. Evidence of Learning Task 2: Quiz 1 (7%)

Type: Quiz 1
Learning Outcomes Assessed: 1, 2
Due Date: Week 4 in class - 20 min
Weight: 7%
Marked out of: 14
Task Description:

The in-class online quiz is an early assessment to examine students' learning on their programming skills. The quiz includes 14 multiple-choice questions randomly selected from online test pools. The quiz will be open-book and conducted online.. This test has a time limit of 20 minutes.
Students can attempt the quiz from any internet enabled computer.
Criteria & Marking:

Correct syntax
Correct analysis of sections of code
Correct and efficient logic and functionality of written algorithm code.
Marks for each attempt are shown immediately upon submission.
The best mark out of all attempts for each quiz will be used to calculate the overall mark for this assessment item.
Extension, and late and deferred attempts are not allowed.
Submission: Online test administered via Griffith College portal
Students can receive feedback (within two weeks) on their assessment items through the labs, or by arranging an appointment with the appropriate teaching staff. Any such request must be arranged before the final examination.
Re-attempt:
Students will be allowed to attempt the quiz three times in the session noting that each attempt will generate a new random set of questions.
Submission: online in the Griffith College portal

This assessment item:

- is a school based activity
- is an individual activity
- does not include a self assessment activity
- may be available for re-assessment (see conditions outlined under Re-attempt above)

3. Evidence of Learning Task 3: Quiz 2 (10%)

Type: Academic development holistic assessment
Learning Outcomes Assessed: 2, 3
Due Date: Week 7 in class – 45 mins
Weight: 20%
Marked out of: 100
Task Description:

The in-class quiz will be held during students' **enrolled sessions in Week 7**. Attendance at these quizzes is therefore compulsory. No deferred test will be offered.
The quiz includes 20 questions randomly selected from online test pools. The quiz will be open-book and conducted online. . Further details on the assessment are available on Griffith College Portal.

Submission: Online in the Griffith College portal

This assessment item:

- is a school based activity
- is an individual activity
- does not include a self assessment activity

4. Evidence of Learning Task 4: In-lab test (20%)

Type: Academic development holistic assessment
Learning Outcomes Assessed: 2, 3
Due Date: Week 10 in class
Weight: 20%
Marked out of: 100
Task Description:

The laboratory quiz will be held during students' **enrolled sessions in Week 10**. Attendance at these quizzes is therefore compulsory. No deferred test will be offered.
The test requires students to work individually to apply their newly acquired programming and problem solving skills to (i) formulate the problem (ii) develop the algorithm (iii) develop the codes (iv) complete the model and analyse the results (v) make engineering decisions. The deliverables include the codes and flow charts.
The codes and the flow charts will be submitted for examination. Further details on the assessment are available on Griffith College portal.
Criteria & Marking:

Accuracy of the Work Undertaken: including analysis, critical review of results and outcomes and the testing and/or validation of the program
Correct and efficient logic and functionality of written algorithm code
Resubmission of project assignments is not permitted for this course.
Students can receive feedback (within two weeks).
Submission: In Person at the Griffith College.

This assessment item:
- is a school based activity
- is an individual activity
- does not include a self assessment activity

5. Evidence of Learning Task 5: Final Exam (45%)

Type: Exam - selected and constructed responses
Learning Outcomes Assessed: 1, 2, 3
Due Date: Examination Period
Weight: 45%
Marked out of: 100
Perusal: 10 minutes
Duration: 120 minutes
Exam Type: Closed Book
Exam Format: On Campus
Task Description:

The final examination will assess students on their fluency of the programming and computing skills; as well as their competency in writing simple programs and algorithms to achieve the specified outcomes.
Criteria & Marking:

Correct syntax
Correct analysis of sections of code
Correct and efficient logic and functionality of written algorithm code.
Other Important Information on Assessment To be eligible to receive a grade of 4 or better for the course, the student must: 1) achieve an aggregate mark of at least 50% overall 2) achieve at least 40% for the final exam. Exam feedback provided upon request. To get feedback students will need to make an appointment with the course convenor.

This assessment item:
- is a centrally organised activity
- is an individual activity
- does not include a self assessment activity
- contains a mandatory pass component

In order to pass this Course, students must:

A. demonstrate assurance of learning of all learning outcomes through graded Evidence of Learning Tasks.
B. achieve an overall pass mark for this course,
6. Submit the assessment task: Final Exam, and
7. Achieve a minimum percentage mark of 40% [min 40 out of 100 for 'Final Exam'].

5.3 Late Submission

An Evidence of Learning Task submitted after the due date, without an approved extension from the teacher, will be penalised. The standard penalty is the reduction of the mark allocated to the Evidence of Learning Task by 5% of the maximum mark applicable for the Evidence of Learning Task, for each calendar day that the task is late. Evidence of learning tasks submitted more than seven calendar 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 task, 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 Evidence of Learning Tasks.

Return of Evidence of Learning Tasks

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

2. Students will be advised of their final grade through the Digital Campus. 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 tasks including the final exam (if applicable) will be recorded in the Course Site and made available to students through the Course Site.

The sum of your marks of evidence of learning *tasks 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 Evidence of Learning Tasks-related policies can be found in the Griffith College Policy Library which include the following policies:

Assessment Policy, Special Consideration, Deferred Assessment, Alternate Exam Sittings, 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 Evidence of Learning Tasks – 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 Evidence of Learning Tasks for students with disabilities while maintaining academic robustness of its programs.

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. Additional Laboratory Rules if applicable will be available on the course site via the Griffith College Digital Campus.

It is imperative that students follow all health and safety procedures & clinical nursing guidelines, as well as any staff instructions given whilst in the lab.

Note: Griffith College acknowledges content derived from Griffith University in Diploma level courses, as applicable.