

## ENGG1003: Introduction to Procedural Programming

Singapore PSB

Trimester 3 - 2023 (Singapore)



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

## OVERVIEW

<b>Course Description</b>	This course introduces students to procedural programming and problem-solving with computers. It assumes that students have basic computer literacy but no prior exposure to computer programming.
<b>Academic Progress Requirements</b>	Nil
<b>Requisites</b>	Students who have successfully completed FNEG1003 cannot enrol in this course.
<b>Contact Hours</b>	<b>Singapore PSB Computer Lab</b> Face to Face On Campus 3 hour(s) per week(s) for Full Term starting Week 1  <b>Lecture</b> Online 3 hour(s) per week(s) for Full Term starting Week 1
<b>Unit Weighting</b>	10
<b>Workload</b>	Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

# COURSE OUTLINE

[www.newcastle.edu.au](http://www.newcastle.edu.au)

CRICOS Provider 00109J

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# CONTACTS

<b>Course Coordinator</b>	<b>Singapore PSB</b> Dr Sajad Ghatrehssamani <a href="mailto:Sajad.Ghatrehssamani@newcastle.edu.au">Sajad.Ghatrehssamani@newcastle.edu.au</a> +61 2 4921 5289 Consultation: via email.
<b>Teaching Staff</b>	Other teaching staff will be advised on the course Canvas site.
<b>School Office</b>	<b>School of Engineering (Callaghan)</b> <a href="mailto:SENG-ADMIN@newcastle.edu.au">SENG-ADMIN@newcastle.edu.au</a> +61 2 4921 5798

# SYLLABUS

<b>Course Content</b>	The following topics are covered: <ul style="list-style-type: none"><li>• The use of common programming language libraries</li><li>• Variables and data types</li><li>• Operators</li><li>• Program flow control</li><li>• Functions</li><li>• Arrays, lists and strings</li><li>• File I/O</li><li>• Use of version control systems for tracking code changes</li><li>• Basic algorithmic principles for solving numerical problems in engineering</li></ul>
<b>Course Learning Outcomes</b>	<b>On successful completion of this course, students will be able to:</b> <ol style="list-style-type: none"><li>1. Describe a programmer's perspective of how computers work using an "input-processing-output" model.</li><li>2. Translate a simple problem into an algorithm suitable for solving on a computer.</li><li>3. Use the basic elements of programming languages including data types, variables, arrays, operators, program flow control, and functions.</li><li>4. Write, run and debug programs implementing computer solvable algorithms.</li><li>5. Demonstrate the use of a version control system for tracking changes in program source code.</li></ol>
<b>Course Materials</b>	To be advised on Canvas.

# COMPULSORY REQUIREMENTS

In order to pass this course, each student must complete ALL of the following compulsory requirements:

## Course Assessment Requirements:

- Assessment 7 - Final Exam: Pass requirement 40% - Must obtain 40% in this assessment item to pass the course.

# ASSESSMENTS

This course has 7 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Assessed Laboratory 1	During your enrolled week 3 lab session	Individual	5%	1, 2, 3, 4
2	Mid-semester quiz	Week 5 in the lecture period	Individual	15%	1, 2, 3, 4
3	Programming Assignment 1	Code submission: 9:00am Monday of week 6. Grading: Demonstration during your enrolled lab session. Students must demonstrate their project in labs to receive a mark.	Individual	20%	1, 2, 3, 4, 5
4	Programming Assignment 2	Code submission: 9:00am Monday of week 10. Grading: Demonstration during your enrolled lab session. Students must demonstrate their project in labs to receive a mark.	Individual	15%	1, 2, 3, 4, 5
5	Assessed Laboratory 2	During your enrolled week 8 lab session.	Individual	5%	1, 2, 3, 4
6	Assessed Laboratory 3	During your enrolled week 9 lab session.	Individual	5%	1, 2, 3, 4
7	Final Exam*	Trimester 3 exam period	Individual	35%	1, 2, 3, 4

\* This assessment has a compulsory requirement.

## Late Submissions

The mark for an assessment item submitted after the designated time on the due date, without an approved extension of time, will be reduced by 10% of the possible maximum mark for that assessment item for each day or part day that the assessment item is late. Note: this applies equally to week and weekend days.

## Assessment 1 - Assessed Laboratory 1

Assessment Type	Tutorial / Laboratory Exercises
Purpose	To assess students' ability to apply material presented in weeks 1-2 to basic problems.
Description	Students prepare a programming solution to a simple problem and implement it during the lab. The problem statement is issued at the start of each students' enrolled lab session.
Weighting	5%
Length	1.5 hours
Due Date	During your enrolled week 3 lab session
Submission Method	In Class
Assessment Criteria	The question sheet will include a marking rubric.
Return Method	In Class
Feedback Provided	In Class

## Assessment 2 - Mid-semester quiz

Assessment Type	Quiz
Purpose	Provide assessment and feedback on all content up to and including week 4.
Description	Online quiz

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<b>Weighting</b>	15%
<b>Length</b>	40 minutes
<b>Due Date</b>	Week 5 in the lecture period
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	Correctness and completeness of answers given.
<b>Return Method</b>	Online
<b>Feedback Provided</b>	Online - Feedback will be returned via Canvas.

### Assessment 3 - Programming Assignment 1

<b>Assessment Type</b>	Written Assignment
<b>Purpose</b>	To assess students' ability to solve a complex problem in the Python programming language.
<b>Description</b>	Programming assignment implementing a problem using the Python programming language.
<b>Weighting</b>	20%
<b>Due Date</b>	Code submission: 9:00am Monday of week 6. Grading: Demonstration during your enrolled lab session. Students must demonstrate their project in labs to receive a mark.
<b>Submission Method</b>	Online Code is submitted to Canvas then demonstrated and assessed during your enrolled lab session.
<b>Assessment Criteria</b>	A marking rubric will be distributed to students along with the question sheet.
<b>Return Method</b>	In Class
<b>Feedback Provided</b>	In Class - Feedback will be provided by demonstrators as they grade your submission.

### Assessment 4 - Programming Assignment 2

<b>Assessment Type</b>	Written Assignment
<b>Purpose</b>	To assess students' ability to solve a complex problem in the Python programming language.
<b>Description</b>	Programming assignment implementing a problem using the Python programming language.
<b>Weighting</b>	15%
<b>Due Date</b>	Code submission: 9:00am Monday of week 10. Grading: Demonstration during your enrolled lab session. Students must demonstrate their project in labs to receive a mark.
<b>Submission Method</b>	Online
<b>Assessment Criteria</b>	A marking rubric will be distributed to students along with the question sheet.
<b>Return Method</b>	In Class
<b>Feedback Provided</b>	In Class - Feedback will be provided by demonstrators as they grade your submission.

### Assessment 5 - Assessed Laboratory 2

<b>Assessment Type</b>	Tutorial / Laboratory Exercises
<b>Purpose</b>	To assess students' ability to apply material presented in weeks 1-7.
<b>Description</b>	Students prepare a programming solution to a simple problem and implement it during the lab. The problem statement is issued at the start of each student's enrolled lab session.
<b>Weighting</b>	5%
<b>Length</b>	1.5 hours
<b>Due Date</b>	During your enrolled week 8 lab session.
<b>Submission Method</b>	In Class Writing during a lab session and graded in person by a demonstrator on completion.
<b>Assessment Criteria</b>	The question sheet will include a marking rubric
<b>Return Method</b>	In Class
<b>Feedback Provided</b>	In Class - Feedback will be provided by demonstrators as they grade your submission.

### Assessment 6 - Assessed Laboratory 3

<b>Assessment Type</b>	Tutorial / Laboratory Exercises
<b>Purpose</b>	To assess students' ability to apply material presented in weeks 1-8.
<b>Description</b>	Students prepare a programming solution to a simple problem and implement it during the lab. The problem statement is issued at the start of each student's enrolled lab session.
<b>Weighting</b>	5%
<b>Length</b>	1.5 hours
<b>Due Date</b>	During your enrolled week 9 lab session.
<b>Submission Method</b>	In Class

<b>Assessment Criteria</b>	Writing during a lab session and graded in person by a demonstrator on completion.
<b>Return Method</b>	The question sheet will include a marking rubric In Class
<b>Feedback Provided</b>	In Class - Feedback will be provided by demonstrators as they grade your submission.

## Assessment 7 - Final Exam

<b>Assessment Type</b>	Formal Examination
<b>Purpose</b>	Final exam is a compulsory course component.
<b>Description</b>	To be held in the formal examination period. Exam covers all contents of the course material.
<b>Weighting</b>	35%
<b>Compulsory Requirements</b>	Pass requirement 40% - Must obtain 40% in this assessment item to pass the course.
<b>Length</b>	2 hours
<b>Due Date</b>	Trimester 3 exam period
<b>Submission Method</b>	Formal Exam
<b>Assessment Criteria</b>	Correctness and completeness of answers given.
<b>Return Method</b>	Not Returned
<b>Feedback Provided</b>	No Feedback
<b>Opportunity to Reattempt</b>	Students WILL be given the opportunity to reattempt this assessment.

## ADDITIONAL INFORMATION

**Grading Scheme** This course is graded as follows:

Range of Marks	Grade	Description
85-100	High Distinction (HD)	Outstanding standard indicating comprehensive knowledge and understanding of the relevant materials; demonstration of an outstanding level of academic achievement; mastery of skills*; and achievement of all assessment objectives.
75-84	Distinction (D)	Excellent standard indicating a very high level of knowledge and understanding of the relevant materials; demonstration of a very high level of academic ability; sound development of skills*; and achievement of all assessment objectives.
65-74	Credit (C)	Good standard indicating a high level of knowledge and understanding of the relevant materials; demonstration of a high level of academic achievement; reasonable development of skills*; and achievement of all learning outcomes.
50-64	Pass (P)	Satisfactory standard indicating an adequate knowledge and understanding of the relevant materials; demonstration of an adequate level of academic achievement; satisfactory development of skills*; and achievement of all learning outcomes.
0-49	Fail (FF)	Failure to satisfactorily achieve learning outcomes. If all compulsory course components are not completed the mark will be zero. A fail grade may also be awarded following disciplinary action.

\*Skills are those identified for the purposes of assessment task(s).

<b>Communication Methods</b>	Communication methods used in this course include: <ul style="list-style-type: none"><li>- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.</li><li>- Email: Students will receive communications via their student email account.</li></ul>
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<b>Course Evaluation</b>	Each year feedback is sought from students and other stakeholders about the courses offered in the University for the purposes of identifying areas of excellence and potential improvement.
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<b>Oral Interviews (Vivas)</b>	As part of the evaluation process of any assessment item in this course an oral examination (viva) may be conducted. The purpose of the oral examination is to verify the authorship of the material submitted in response to the assessment task. The oral examination will be conducted in accordance with the principles set out in the <a href="#">Oral Examination (viva) Procedure</a> . In cases where the oral examination reveals the assessment item may not be the student's own work the case will be dealt with under the <a href="#">Student Conduct Rule</a> .
<b>Academic Misconduct</b>	All students are required to meet the academic integrity standards of the University. These standards reinforce the importance of integrity and honesty in an academic environment. Academic Integrity policies apply to all students of the University in all modes of study and in all locations. For the Student Academic Integrity Policy, refer to <a href="https://policies.newcastle.edu.au/document/view-current.php?id=35">https://policies.newcastle.edu.au/document/view-current.php?id=35</a>
<b>Adverse Circumstances</b>	<p>The University acknowledges the right of students to seek consideration for the impact of allowable adverse circumstances that may affect their performance in assessment item(s). Applications for special consideration due to adverse circumstances will be made using the online Adverse Circumstances system where:</p> <ol style="list-style-type: none"><li>1. the assessment item is a major assessment item; or</li><li>2. the assessment item is a minor assessment item and the Course Co-ordinator has specified in the Course Outline that students may apply the online Adverse Circumstances system;</li><li>3. you are requesting a change of placement; or</li><li>4. the course has a compulsory attendance requirement.</li></ol> <p>Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at: <a href="https://policies.newcastle.edu.au/document/view-current.php?id=236">https://policies.newcastle.edu.au/document/view-current.php?id=236</a></p>
<b>Important Policy Information</b>	The Help button in the Canvas Navigation menu contains helpful information for using the Learning Management System. Students should familiarise themselves with the policies and procedures at <a href="https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures">https://www.newcastle.edu.au/current-students/no-room-for/policies-and-procedures</a> that support a safe and respectful environment at the University.

*This course outline was approved by the Head of School on 1 September 2023. No alteration of this course outline is permitted without Head of School approval. If a change is approved, students will be notified and an amended course outline will be provided in the same manner as the original.*

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## Graduate Profile Statements

This course builds students' capacity in the following University of Newcastle Bachelor of Engineering Graduate Profile Statements (based on 2011 Engineers Australia revised Stage 1 Competency Standards for Professional Engineers):

UON Att.	University of Newcastle Bachelor of Engineering Graduate Profile Statements/ Engineers Australia Stage 1 competency statements	Taught	Practised	Assessed	Skill Level (1-4)
	<b>Professional Attributes</b>				
11	3.1. Ethical conduct and professional accountability				
12	3.2. Effective oral and written communication in professional and lay domains.				
13	3.3. Creative, innovative and pro-active demeanour.				
14	3.4. Professional use and management of information.	✓	✓	✓	1
15	3.5. Orderly management of self, and professional conduct.	✓	✓	✓	1
16	3.6. Effective team membership and team leadership.				
	<b>Engineering Ability</b>				
7	2.1. Application of established engineering methods to complex engineering problem solving.	✓	✓	✓	1
8	2.2. Fluent application of engineering techniques, tools and resources.	✓	✓	✓	1
9	2.3. Application of systematic engineering synthesis and design processes.				
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.				
	<b>Knowledge Base</b>				
1	1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.	✓	✓	✓	1
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.	✓	✓	✓	1
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.				
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.				
5	1.5. Knowledge of contextual factors impacting the engineering discipline.				
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.				