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| Course Code: | 1001ICT |
| Course Name: | Programming 1 |
| Semester: | Trimester1, 2019 |
| Program: | Diploma of Engineering |
| | Diploma of Information Technology |
| Credit Points: | 10 |
| Course Coordinator: | Dr Seyedali Mirjalili |
| Document modified: | 01/9/2018 |

Teaching Team

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

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.

Prerequisites

This course is not a prerequisite for any other Diploma courses.

Brief Course Description

Programming I is a 10 credit point course within the Diploma of Information Technology. The course is situated within the first semester of the program. The Diploma of Information Technology is designed to provide students with a pathway to:

- further university study in Information Technology and related degrees, or
- employment opportunities within the IT industry.

Programming I is the first programming course students encounter in the Diploma of Information Technology. The course introduces modern programming concepts and techniques and provides a foundation for subsequent programming courses within the Diploma of Information Technology. You will learn how to code in a creative context, utilising a practical and hands-on approach, producing generative art, data visualisations, and interactive interfaces

Rationale

All information technology professionals require experience and skills in problem solving, and implementation of solutions on a computer. In this course you will learn how to code by producing generative art. We will cover concepts such as the drawing plane and drawing simple shapes, responding to user input, understanding physics required to produce simple simulations, applying filters to video and images in real-time, sound, and the third dimension. At the end of this course you will have a strong understanding of the fundamentals of coding as well as the ability to apply them to generative art, data visualisation, and interactive animations.

Aims

This course introduces practical computer programming concepts and skills through creative ideas and challenges. Students will develop programs that can generate images, animations and sound and learn how to interact with them to change their behavior. Starting with simple processes, the course will develop students' programming skills by introducing algorithmic techniques for increasingly complex visual and sonic digital projects.

Learning Outcomes

Upon successful completion of this course you will be able to demonstrate:

- 1 Create interactive programs by understanding the graphics pipeline and handling user events
 - 2 Solve programming problems that involve simple programming constructs such as variables, sequence, selection, iteration, and arrays
 - 3 Develop software which is able to transform data over the network into visualisations and sonic experiences
 - 4 Analyse and design a modular program using functions and objects
 - 5 Integrate visualisations into web pages using JavaScript libraries
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Texts and Supporting Materials

P5.js book: <https://p5js.org/books/>

A recommended reading list will be provided via the course website. Where proprietary software is used for program development, it will be provided in laboratories on campus. Where possible, free and/or open source software that runs on Windows, Macintosh, and Linux will be used.

Organisation and Teaching Strategies

The course will be presented by a 2-hour lecture, and a 1-hour workshop, and a 2-hour laboratory per week. Lectures will be used to present problem solving and programming techniques which will be applied in subsequent laboratories, quizzes and the assignment. This course introduces you to modern programming techniques, including event handling and multi-threading.

The material is presented in a gently graduated manner, and uses an intuitive graphical programming environment to introduce concepts, before addressing them using more powerful traditional methods.

Class Contact Summary

Attendance:

Quizzes, assessed laboratories and the demonstration component of the assignment can only be done within formal class time, you are required to attend all lectures and their nominated

laboratory session every week.

Your attendance in class will be marked twice during a four hour class. To receive full attendance, you must be present in the classroom on both occasions. Therefore, you are encouraged to attend and participate in all classes throughout the semester.

Participation in Class

You are expected to actively participate in classes each week.

Consultant Times

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

Course Materials

Lecture notes will be made available to you on the Learning@GriffithCollege site on the student portal and you are expected to print these out and bring them to each class so that extra notes can be added.

Independent Learning

You are expected to reinforce your learning from class time by undertaking sufficient independent study {approximately 6 hours per week outside of class time} so that you can achieve the learning outcomes of the course. This may involve you spending time reviewing lecture notes, practicing programming skills and reviewing tutorial exercises.

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].

Content Schedule

Weekly Teaching Schedule

| Week | Topic | Activity | Readings |
|-------------|---|-----------------|--------------------------|
| 1 | Introduction; Course overview and introduction to interaction and generative art, and the p5.js tool. | Lecture | Refer to course web site |

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| | Introduction & Demonstrations | Workshop | Refer to course web site |
| | Introduction & Demonstrations | Laboratory | |
| 2 | Drawing and loops: Learn about coordinate systems, colours, and how to draw shapes. Use iteration and loops to draw repeated patterns. | Lecture | Refer to course web site |
| | Drawing and loops | Workshop | Refer to course web site |
| | Drawing and loops | Laboratory | |
| 3 | Animation and Interaction: Learn about the p5.js draw loop and variables to perform simple animations. Use if statements to respond to mouse input events. | Lecture | Refer to course web site |
| | Animation and Interaction | Workshop | Refer to course web site |
| | Animation and Interaction | Laboratory | |
| 4 | A simple game: Produce a simple game using images and keyboard event handling. Display text and perform simple object collision detection. | Lecture | Refer to course web site |
| | A simple game/interactive application | Workshop | Refer to course web site |
| | A simple game/interactive application | Laboratory | |
| 5 | Arrays and GUI components: Use arrays to manage multiple objects. Display GUI objects like buttons. | Lecture | Refer to course web site |
| | Arrays and GUI components | Workshop | Refer to course web site |
| | Arrays and GUI components | Laboratory | |
| 6 | Solving Problems: Learn techniques to solve larger programming problems. Access and visualise data. | Lecture | Refer to course web site |
| | Access and visualise data | Workshop | Refer to course web site |
| | Access and visualise data | Laboratory | |
| 7 | Functions: Use functions to write re-usable code and to simplify larger problems. Learn how to use parameters and return values. | Lecture | Refer to course web site |
| | User-defined functions | Workshop | Refer to course web site |
| | User-defined functions | Laboratory | |
| 8 | Video and Sound: Learn how to integrate video and sound. Perform simple image manipulations on live video streams. | Lecture | Refer to course web site |

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| | Video and Sound | Workshop | Refer to course web site |
| | Video and Sound | Laboratory | |
| 9 | 3D: Build 3D visualisations using p5.js's simple 3D functionality. | Lecture | Refer to course web site |
| | 3D | Workshop | Refer to course web site |
| | 3D | Laboratory | |
| 10 | Particle Systems: Build more complex animation trajectories and use particle systems. | Lecture | Refer to course web site |
| | Particle Systems | Workshop | Refer to course web site |
| | Particle Systems | Laboratory | |
| 11 | Publishing to the web and mobile: Learn how to publish p5.js projects to the web and mobile. | Lecture | Refer to course web site |
| | Publishing to the web and mobile, assignment help | Workshop | Refer to course web site |
| | Publishing to the web and mobile, assignment help | Laboratory | |
| 12 | Course review. | Lecture | |
| | Review and assignment help | Workshop | |
| | Review and assignment help | Laboratory | |

Assessment

This section sets out the assessment requirements for this course.

Summary of Assessment

| Item | Assessment Task | Weighting | Relevant Learning Outcomes | Due Date |
|------|------------------|-----------|----------------------------|----------|
| 1 | Weekly workshops | 20% | 1, 2, 3, 4, 5 | 2-11 |
| 2 | Assignment 1 | 30% | 1, 2 | 7 |
| 3 | Quizzes | 20% | 1, 2, 3, 4 | 4,11 |

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| 4 | Assignment 2 | 30% | 1, 2, 3, 4, 5 | 12 |
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Assessment Details

Title: Weekly workshops

Type: Assignment - Problem Solving Assignment

Learning Outcomes Assessed: 1, 2, 3, 4, 5

Due Date: Week 2 to Week 11

Weight: 20%

Marked out of: 20

Task Description:

10 in-class assessed workshops starting from week 2.

Criteria & Marking:

Each workshop will be marked out of 2. Mark breakdowns will be provided in the workshop worksheet.

Submission: Demonstrate to tutor in class.

This assessment item:

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

Title: Assignment 1

Type: Assignment - Problem Solving Assignment

Learning Outcomes Assessed: 1, 2

Due Date: Week 7

Weight: 30%

Marked out of: 30

Task Description:

Produce a data visualisation, sourcing data from an online data source and presenting it in a meaningful way based on the concepts learned in the first 5 weeks of the course.

Criteria & Marking:

Assignment details and marking rubric will be made available through the portal.

Submission: Project must be submitted through portal and demonstrated in class.

This assessment item:

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

Title: Quizzes

Type: Test or quiz

Learning Outcomes Assessed: 1, 2, 3, 4

Due Date: Week 4 & Week 11

Weight: 20%

Marked out of: 20

Task Description:

Two in-class quizzes assessing content from the lectures and workshops.

Criteria & Marking:

Quizzes will be held in the computer labs and conducted via the portal. Results will be made available after completion of the quiz.

Submission: Quiz will be conducted through the portal

This assessment item:

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

Title: Assignment 2

Type: Assignment - Problem Solving Assignment

Learning Outcomes Assessed: 1, 2, 3, 4

Due Date: Week 12

Weight: 30%

Marked out of: 30

Task Description:

Produce a game (arcade or mobile type) using a combination of images, videos, sounds, 3D graphics, animation, and interaction

Criteria & Marking:

Details for the assignment and marking rubrics will be made available on the portal.

Submission: Submitted through the portal and demonstrated in class.

This assessment item:

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

Submission and Return of Assessment Items

Normally you will be able to collect your assignments in class within fourteen [14] days of the due date for submission of the assignment.

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 assignment, 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 Medical Certificate]. Please refer to the Griffith College website - Policy Library - for guidelines regarding extensions and deferred assessment.

Assessment Feedback

Feedback for laboratory exercises will be immediate and in the laboratory session in which they are submitted. Feedback for quizzes will be given the subsequent week in lectures and via the course website.

Feedback for the in-laboratory demonstration component of the project will be immediate. Feedback for the electronically submitted written component of the project will be returned electronically via email and/or the course web site within two weeks.

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 | Yes | Yes | Yes |
| Critical and Innovative Thinking | Yes | Yes | Yes |
| Academic Integrity | Yes | Yes | Yes |
| Self Directed Learning | | Yes | |
| Team Work | | Yes | |

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| Cultural Intelligence | | Yes | |
| English Language Proficiency | | Yes | |

Additional Course Information

Teacher and Course Evaluations

Students enjoy their journey of acquiring fundamental knowledge and skills in programming. They appreciate the benefits of regular assessment as these are intended to help them reach critical learning milestones at a comfortable pace. In response to student suggestion “to get more guided help on the topic”, teaching and peer support has been augmented with online tools to build their knowledge and skills rapidly. After successfully completing this course, the majority of students feel more confident with programming and therefore perform better in Software Development (1802ICT).

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.

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.

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. For example:

- > 5 minutes and <= 24 hours 10%
- > 24 hours and <= 48 hours 20%
- > 48 hours and <= 72 hours 30%
- > 72 hours and <= 96 hours 40%
- > 96 hours and <= 120 hours 50%
- > 120 hours 100%
- Assessment submitted more than five days late will be awarded a mark of zero (0)
- Note that:
- 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 the calculation of a 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.

Risk Assessment Statement

There are no out of the ordinary risks associated with this course.

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