SUBJECT OUTLINE

41025 Introduction to Software Development

Course area	UTS: Information Technology
Delivery	Autumn 2020; City
Subject classification	Software Development – 200 level
Credit points	6cp
Requisite(s)	48023 Programming Fundamentals OR 48430 Fundamentals of C Programming
Result type	Grade and marks

Attendance: 2hpw (campus workshop/studio), 8hpw (self-directed study)

Subject coordinator

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Subject description

This subject introduces students to the fundamentals of contemporary software development. An overview of the agile and non-agile software development principles, methods, tools and techniques is presented. Current trends and challenges in the practice of software development are explored. In this subject, students learn how to design, develop and evaluate software that implements commercially realistic but manageably small software requirements. Most often the task is to modify or extend some existing software feature or function but can also be to create new features or functions. Peer learning and collaboration are encouraged but, ultimately, each student must complete their tasks individually. The primary objective is that students experience, understand the importance of, and can apply sound professional practices of software development.

Subject learning objectives (SLOs)

Upon successful completion of this subject students should be able to:

1. Investigate and solve software development problems with minimal supervision.
2. Determine and balance the competing goals of software development activities within their constraints
3. Plan and manage a software development task to create, modify or extend a software feature or function to completion within the task constraints.
4. Apply sound software engineering practices to successfully create, modify or extend a software feature or function.
5. Communicate clearly software and task information to interested stakeholders.

Course intended learning outcomes (CILOs)

This subject also contributes specifically to the development of the following Course Intended Learning Outcomes (CILOs):

- Socially Responsible: FEIT graduates identify, engage, interpret and analyse stakeholder needs and cultural perspectives, establish priorities and goals, and identify constraints, uncertainties and risks (social, ethical, cultural, legislative, environmental, economics etc.) to define the system requirements. (B.1)
- Design Oriented: FEIT graduates apply problem solving, design and decision-making methodologies to develop components, systems and processes to meet specified requirements. (C.1)

- Collaborative and Communicative: FEIT graduates work as an effective member or leader of diverse teams, communicating effectively and operating within cross-disciplinary and cross-cultural contexts in the workplace. (E.1)
- Reflective: FEIT graduates critically self-review their performance to improve themselves, their teams, and the broader community and society. (F.1)

Contribution to the development of graduate attributes

A complete list and description of Graduate Attributes for the Faculty of Engineering and Information Technology can be found at:

https://www.uts.edu.au/about/faculty-engineering-and-information-technology/who-we-are/engineering-and-it-uts/gradua

Teaching and learning strategies

Students will learn professional software development practices through hands-on workshops (tutorials and labs) supported by online lectures. Students will prepare for the workshops by studying required material and doing online quiz in order to participate fully in the workshop activities. In workshops, the professional practices will be demonstrated by the tutors before being applied by students. As the subject progresses, students gain sufficient competence to complete software development tasks on their own.

Content (topics)

Task management with work tickets

Software development environments

Software development tools

Software construction

Software evaluation

Program

Week/Session	Dates	Description
1	W/C 09 Mar 2020	**Workshop 1: Introduction** Software development process Software development environment - IDE & Git Software development project Software project team formation Software project team collaboration setup **Notes:** **Pre-workshop (Preparation & Orientation):** Read the subject outline Do Java refresher Watch the online videos and do the online Quiz 0 (No Marks) **Assignment 1 will be released.** UTS exam conditions will apply to all assessments
2	W/C 16 Mar 2020	**Workshop 2: Analysis & Planning** Team composition and communication Tickets, epics, user stories & use cases Estimation, prioritisation, user story map, card wall and product backlog **Notes:** **Pre-workshop:**

		Watch the online videos and do the online Quiz 1 UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 1. See assignment 1 marking criteria.
3	W/C 23 Mar 2020	**Workshop 3: Software Architecture & Design** Software application architecture - MVC Data design (M) User interface design (V) Logic flow design (C) **Notes:** **Pre-workshop:** Watch the online videos and do the online Quiz 2 Students will work on their assignment 1 and bring it to workshop for feedback. UTS exam conditions will apply to all assessments. **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 1. See assignment 1 marking criteria.
4	W/C 30 Mar 2020	**Workshop 4: Software Implementation & Testing** Web application development environment - IDE & Web/Application Server Web application components Code management - Git Testing **Notes:** **Pre-workshop:** Watch the online videos and do the online Quiz 3 Students will work on their assignment 1 and bring it to workshop for feedback. UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 1. See assignment 1 marking criteria.
5	W/C 06 Apr 2020	**Workshop 5: User Interface Development** Web application user interface development Web application request & response model Web application GET and POST methods **Notes:** **Pre-workshop:** Watch the online videos and do the online Quiz 4 Students will work on their assignment 1 and bring it to workshop for

		feedback. UTS exam conditions will apply to all assessments **Good Friday: 10 April (Relevant topic/ session will be in the following week)** **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 1. See assignment 1 marking criteria.
6	W/C 13 Apr 2020	**Workshop 6: Application Data** Beans Cookies Session **Notes:** **Pre-workshop:** Watch the online videos and do the online Quiz 5 **Assignment 2 will be released.** UTS exam conditions will apply to all assessments **Easter Monday: 13 April (Relevant topic/ session will be in the following week)** **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignments 1/2. See assignments 1/2 marking criteria.
-	W/C 20 Apr 2020	Mid Session StuVac **Monday 20 April:** Make up workshop & quiz 5 for only Monday workshop students **Friday 24 April:** Make up workshop & quiz 5 for only Friday workshop students See time table for your relevant workshop/ activity. **Notes:** **Assignment 1 softcopy due by Friday April 24, 2020 by 11:55 PM.** **Assignment 1 showcase schedule will be annouced.** UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignments 1/2. See assignments 1/2 marking criteria.
7	W/C 27 Apr 2020	**Assignment 1 Assessment Showcase (Compulsory)** **Notes:** Assignment 1 showcase will be conducted during the workshop time slots. See assignment 1 showcase schedule for details.

		UTS exam conditions will apply to all assessments **Attendance:** Must attend/present the assignment 1 during showcase. Individuals who fail to attend the showcase will not receive marks for assignment 1.
8	W/C 04 May 2020	**Workshop 7: Application Datastore** Web application database Relational database model SQL & Java database store **Notes:** UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 2. See assignment 2 marking criteria.
9	W/C 11 May 2020	**Workshop 8: Application Logic** Application and database connectivity Application DAO **Notes:** UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 2. See assignment 2 marking criteria.
10	W/C 18 May 2020	**Workshop 9: Putting It All Together** MVC software architecture & design MVC software implementaion and testing Software build & release management Software operations managemen **Notes:** UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 2. See assignment 2 marking criteria.
11	W/C 25 May 2020	**Workshop 10: Special Topics** Non-relational database model Mongo DB **Notes:** Students will present the work in progress software for assignment 2 in workshop to get final feedback and then finalise and submit. **Assignment 2 softcopy due by Friday 29 May, 2020 by 11:55 PM.** **Assignment 2 showcase schedule will be annouced.**

		UTS exam conditions will apply to all assessments **Attendance:** Must attend the workshop and log the workshop activities in the individual log book for capturing learning evidence for receiving marks for assignment 2. See assignment 2 marking criteria.
12	W/C 01 Jun 2020	**Assignment 2 Assessment Showcase (Compulsory)** **Notes:** Assignment 2 showcase will be conducted during the workshop time slots. See assignment 2 showcase schedule for details. UTS exam conditions will apply to all assessments **Attendance:** Must attend/present the assignment 2 during showcase. Individuals who fail to attend the showcase will not receive marks for assignment 2.

Assessment

Please refer to the Policy and the Procedures on Assessment of Coursework Subjects.

The bulk of the subject's assessment consists of a small software development project assignment, delivered in two phases (Assessment Items 1-2) with individual contribution logbooks, and individual online quizzes (Assessment Item 3). The additional information will also be provided in the project and online quiz brief.

Assessment task 1: Project – Analysis, Planning, Architecture & Design

Intent: Demonstrate the ability to analyse, plan, architect and design a software application.

Objective(s): This assessment task addresses the following subject learning objectives (SLOs):

1, 2, 3, 4 and 5

This assessment task contributes to the development of the following Course Intended Learning Outcomes (CILOs):

B.1, C.1, E.1 and F.1

Type: Project

Groupwork: Group, group and individually assessed

Weight: 30%

Task: This assessment task will require a team of 4-6 students to analyse the assigned project case study problem; and produce, submit and present a group report containing

- Software requirements & development plan; and
- architecture & design (description and software prototype).

The deliverables of this assessment task also include a compulsory oral/visual group report and prototype presentation (no PowerPoint slides) during the scheduled assignment assessment or review session (showcase), and individual contribution logbooks - as per Subject Weekly Schedule. Any individual student who failed to appear and present in these compulsory assignment assessment and review sessions (Showcase) will receive zero (0) as a final individual mark.

The online tool SPARK shall be used to assess an individual's contribution to Assessment Item 1. Individuals who fail to provide a SPARK assessment of their peers within a SPARK rating period (usually 1 full week, after the delivery of each group Assessment Item) will receive anywhere between 00.0 and 0.5 (50%) of the group mark for that group Assessment Item. Individuals who "abuse" the SPARK assessment methodology will also receive anywhere between 0.0 and 0.5 (50%) of the group mark for that group Assessment Item. It is possible to exclude one or more person's marks from the calculations in SPARK tool, if there is evidence of untruthful or inappropriate ratings being made. This can occur from group members colluding to fabricate rating values or from individuals providing inflated ratings. These situations can be very easily detected using SPARK. The subject co-ordinator has the right to override SPARK calculated values in such cases. Students deemed to have provided untruthful or inflated ratings will be given the low rating which may cause them to fail the subject.

An individual's mark for this group work assessment shall be computed as:

Individual Student Mark = Group Mark for Assessment Item 1 * Individual Spark plus rating.

The additional information about the software project case study and assessment tasks will be provided in the project brief.

Length: This is a technical report, thus there is no compulsory minimum and maximum word limit. For a general guidance, the recommended word limit for this assignment is maximum 5000 words excluding diagrams, bibliography, logbooks and appendices. Word limit will be regarded as recommended rather than compulsory, and no student will be disadvantaged by being under or over the recommended word limit.

Due: 11:55pm 24/04/2020
See also Further information.

Further information: This is a project-based subject to be completed in small teams or groups. The project is divided into two main assessment tasks and deliverables. This task is a part of the main project. The additional information will also be provided in the project brief.

Assessment task 2: Project – Implementation & Testing

Intent: Demonstrate the ability to implement and test a software application using the professional software development practices.

Objective(s): This assessment task addresses the following subject learning objectives (SLOs):

1, 2, 3, 4 and 5

This assessment task contributes to the development of the following Course Intended Learning Outcomes (CILOs):

B.1, C.1, E.1 and F.1

Type: Project

Groupwork: Group, individually assessed

Weight: 50%

Task: This assessment task will require a team of 4-6 students to produce, submit and present a group report (comprises of individual contributions), small working software application (comprises of individually implemented and tested software features or modules) and individual contribution logbooks. Based on the plan, software requirements, architecture and design (submitted for Assessment Items 1), each individual student in the group shall

- Implement and test the assigned feature or module of the small software application; and
- Provide the brief description of the assigned software application feature or module, non-functional aspects, and software testing results with executed tests and defect log.

The individual student contributions or parts will be collated in a group deliverable for submission and assessment (group submission but individual assessment). The deliverables of this assessment task also include a compulsory oral/visual presentation (no PowerPoint slides) of the individually implemented working software application during the scheduled assignment assessment or review session (showcase), individual contribution logbooks and working software code implemented - as per Subject Weekly Schedule. Any individual student who failed to appear and present in these compulsory assignment assessment and review sessions (Showcase) will receive zero (0) as a final individual mark. The additional information about the software project case study and assessment tasks will be provided in the project brief.

Length: N/A

Due: 11:55pm 29/05/2020
See also Further information.

Further information: This is a project-based subject to be completed in small teams or groups. The project is divided into two main assessment tasks and deliverables. This task is a part two of the main project. The additional information will also be provided in the project brief.

Assessment task 3: Online Quiz

Intent: Demonstrate the ability to understand the theory and practice of software development.

Objective(s): This assessment task addresses the following subject learning objectives (SLOs):

1, 2, 3 and 5

This assessment task contributes to the development of the following Course Intended Learning Outcomes (CILOs):

B.1, C.1 and F.1

Type: Quiz/test

Groupwork: Individual

Weight: 20%

Task: It includes 5 pre-workshop online quizzes (complete before the scheduled workshop session) (of about maximum 20 minutes each). The quizzes shall measure the degree that the theory, as taught by the subject and practised by the individual in each of the phases of the project, is understood by each individual.

Length: There is no word limit.

Due: Not applicable; see weekly schedule.

Further information:	The additional information about each quiz will be provided in the quiz handout as per Subject Weekly Schedule. No quiz submissions are allowed after the deadline. No makeup quizzes are allowed.

Use of plagiarism detection software

Each phase of the group project shall produce a group deliverable (comprises of individual contributions) and individual contribution logbooks (Assessment Items 1-2). Each group deliverable shall be submitted via Turnitin before the declared deliverable review dates shown in the subject weekly schedule. Before each deliverable is submitted, it is advised to check it using the Turnitin tool embedded in UTSOnline for originality. That is to say, the two group deliverables shall be submitted with the usual faculty cover sheet, signed and scanned by each team member, declaring originality. The deliverable can be amended and submitted to Turnitin multiple times prior to the delivery date and time to ensure compliance with the requirement. Any cut and paste or chunks obviously originating from another student's submitted assignment will be dealt as per UTS academic integrity guidelines. Tutors will check the Turnitin matching index. As a guideline, originality matching index should be less than 30% - discretion of the Subject Coordinator and Tutor.

Moderation of marks

Marks shall be determined and allocated by the tutor/markers according to the assessment criteria; however, allocation of marks for each of the assessment items shall be overseen by the Subject Coordinator through mark coordination meetings between the tutors and coordinator. This will ensure the consistency of expectations and mark allocations across the subject.

Assessment feedback

Each of Assessment Items 1-2 feedback shall be provided with marks to each team by the tutor/marker during the assessment item review session or in workshop within 2 weeks after the assignment due or submission date. The results of the online quizzes (Assessment Item 3) shall be determined after each quiz is completed and the feedback will be provided in the workshop. Quizzes are also a mechanism to provide early feedback before the census date. There shall be no feedback on the quality of the individual contribution logbook.

Examination material or equipment

There is no final exam in this subject. The quiz shall be completed online unless otherwise advised by the subject coordinator.

Minimum requirements

To pass this subject students must achieve an overall mark of 50 or greater.

Required texts

This is a dynamic and practical subject. There is no fixed or single textbook for this subject. However, students may choose to buy and consult the relevant recommended books and references.

Recommended texts

Ian Sommerville, Software Engineering, 9th Edition (or better), Addison-Wesley.

References

Agile Manifesto. 2001, Manifesto for Agile Software Development. http://agilemanifesto.org/.
Agile Modelling. http://www.agilemodeling.com/.
Agile Videos and Tutorials. http://www.tvagile.com/
Gill, A.Q. 2015, Adaptive Cloud Enterprise Architecture, World Scientific.
Gill, A.Q. & Bunker, D. 2013, SaaS Requirements Engineering for Agile Development in Xiaofeng Wang, Nour Ali, Isidro Ramos, Richard Vidgen (eds), Agile and Lean Service-Oriented Development: Foundations, Theory, and Practice, IGI, USA, pp. 64-93.
Kent Beck, Extreme Programming Explained: Embrace Change, Addison-Wesley Professional.
Len Bass, Paul Clements, and Rick Kazman, Software Architecture in Practice, 3rd Edition, Addison-Wesley.
Lisa Crispin and Janet Gregory, Agile Testing: A Practical Guide For Testers and Agile Teams, 1st Edition, Addison-Wesley.
Mike Cohn, Succeeding with Agile: Software Development Using Scrum, 1st Edition, Addison-Wesley Professional.

Mike Cohn, Agile Estimating and Planning, 1st Edition, Prentice Hall.
Mike Cohn, User Stories Applied for Agile Software Development, 1st Edition, Addison-Wesley Professional.
Model Driven Development, https://www.omg.org/mda/.
Simon Bennett, Steve McRobb and Ray Farmer, Object-Oriented Systems Analysis and Design Using UML, 4th Edition, McGraw Hill.
Smart, J.F. 2015, BDD in Action: Behaviour-Driven Development for the Whole Software Lifecycle. Manning Publications Co.
Thomas Erl, Service-Oriented Architecture: Concepts, Technology, and Design, 1st Edition, Prentice Hall.
Qumer, A. & Henderson-Sellers, B. 2008, An evaluation of the degree of agility in six agile methods and its applicability for method engineering, Information and Software Technology, vol. 50, no. 4, pp. 280-295.

Graduate attribute development

For a full list of the faculty's graduate attributes refer to the FEIT Graduate Attributes webpage.

For the contribution of subjects taken in the Bachelor of Engineering (Honours) or Master of Professional Engineering to the Engineers Australia Stage 1 Competencies, see the faculty's Graduate Attributes and the Engineers Australia Stage 1 Competencies webpage.

Assessment: faculty procedures and advice

Marking criteria

Marking criteria for each assessment task will be available on the Learning Management System: UTS Online.

Extensions

When, due to extenuating circumstances, you are unable to submit or present an assessment task on time, please contact your subject coordinator before the assessment task is due to discuss an extension. Extensions may be granted up to a maximum of 5 days (120 hours). In all cases you should have extensions confirmed in writing.

Special consideration

If you believe your performance in an assessment item or exam has been adversely affected by circumstances beyond your control, such as a serious illness, loss or bereavement, hardship, trauma, or exceptional employment demands, you may be eligible to apply for Special Consideration.

Late penalty

Work submitted late without an approved extension is subject to a late penalty of 10 per cent of the total available marks deducted per calendar day that the assessment is overdue (e.g. if an assignment is out of 40 marks, and is submitted (up to) 24 hours after the deadline without an extension, the student will have four marks deducted from their awarded mark). Work submitted after five calendar days is not accepted and a mark of zero is awarded.

For some assessment tasks a late penalty may not be appropriate – these are clearly indicated in the subject outline. Such assessments receive a mark of zero if not completed by/on the specified date. Examples include:

a. weekly online tests or laboratory work worth a small proportion of the subject mark, or
b. online quizzes where answers are released to students on completion, or
c. professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date, or
d. take-home papers that are assessed during a defined time period, or
e. pass/fail assessment tasks.

Querying results

If you wish to query the result of an assessment task or the final result for a subject:

- Assessment task: query the result with the Subject Coordinator within 5 working days of the date of release of the result
- Final subject result: submit an application for review within 5 working days of the official release of the final subject result.

Academic liaison officer

Academic liaison officers (ALOs) are academic staff in each faculty who assist students experiencing difficulties in

their studies due to: disability and/or an ongoing health condition; carer responsibilities (e.g. being a primary carer for small children or a family member with a disability); and pregnancy.

ALOs are responsible for approving adjustments to assessment arrangements for students in these categories. Students who require adjustments due to disability and/or an ongoing health condition are requested to discuss their situation with an accessibility consultant at the Accessibility Service before speaking to the relevant ALO.

Statement about assessment procedures and advice

This subject outline must be read in conjunction with the Coursework Assessments policy and procedures.

Statement on copyright

Teaching materials and resources provided to you at UTS are protected by copyright. You are not permitted to re-use these for commercial purposes (including in kind benefit or gain) without permission of the copyright owner. Improper or illegal use of teaching materials may lead to prosecution for copyright infringement.

Statement on plagiarism

Plagiarism and academic integrity

At UTS, plagiarism is defined in Rule 16.2.1(4) as: 'taking and using someone else's ideas or manner of expressing them and passing them off as ... [their] own by failing to give appropriate acknowledgement of the source to seek to gain an advantage by unfair means'.

The definition infers that if a source is appropriately referenced, the student's work will meet the required academic standard. Plagiarism is a literary or an intellectual theft and is unacceptable both academically and professionally. It can take a number of forms including but not limited to:

- copying any section of text, no matter how brief, from a book, journal, article or other written source without duly acknowledging the source
- copying any map, diagram, table or figure without duly acknowledging the source
- paraphrasing or otherwise using the ideas of another author without duly acknowledging the source
- re-using sections of verbatim text without using quote marks to indicate the text was copied from the source (even if a reference is given).

Other breaches of academic integrity that constitute cheating include but are not limited to:

- submitting work that is not a student's own, copying from another student, recycling another student's work, recycling previously submitted work, and working with another student in the same cohort in a manner that exceeds the boundaries of legitimate cooperation
- purchasing an assignment from a website and submitting it as original work
- requesting or paying someone else to write original work, such as an assignment, essay or computer program, and submitting it as original work.

Students who condone plagiarism and other breaches of academic integrity by allowing their work to be copied are also subject to student misconduct Rules.

Where proven, plagiarism and other breaches of misconduct are penalised in accordance with UTS Student Rules Section 16 – Student misconduct and appeals.

Avoiding plagiarism is one of the main reasons why the Faculty of Engineering and IT is insistent on the thorough and appropriate referencing of all written work. Students may seek assistance regarding appropriate referencing through UTS: HELPS.

Work submitted electronically may be subject to similarity detection software. Student work must be submitted in a format able to be assessed by the software (e.g. doc, pdf (text files), rtf, html).

Further information about avoiding plagiarism at UTS is available.

Retention of student work

The University reserves the right to retain the original or one copy of any work executed and/or submitted by a student as part of the course including, but not limited to, drawings, models, designs, plans and specifications, essays, programs, reports and theses, for any of the purposes designated in Student Rule 3.9.2. Such retention is not to affect any copyright or other intellectual property right that may exist in the student's work. Copies of student work may be retained for a period of up to five years for course accreditation purposes. Students are advised to contact their subject

coordinator if they do not consent to the University retaining a copy of their work.

Statement on UTS email account

Email from the University to a student will only be sent to the student's UTS email address. Email sent from a student to the University must be sent from the student's UTS email address. University staff will not respond to email from any other email accounts for currently enrolled students.