

SENG3320: Software Verification and Validation

Callaghan

Semester 1 - 2020



THE UNIVERSITY OF
NEWCASTLE
AUSTRALIA

OVERVIEW

Course Description This course focuses on software verification and validation throughout the software life cycle. Topics covered in this course will include reviews, inspections, formal verification, testing techniques, and testing frameworks

Assumed Knowledge SENG2130 Systems Analysis and Design

Contact Hours

Callaghan

Lecture

Face to Face On Campus

2 hour(s) per Week for Full Term

Workshop

Face to Face On Campus

2 hour(s) per Week for Full Term

**Unit Weighting
Workload**

10

Students are required to spend on average 120-140 hours of effort (contact and non-contact) including assessments per 10 unit course.

COURSE OUTLINE

CONTACTS

Course Coordinator **Callaghan**
A/Pr Hongyu Zhang
Hongyu.Zhang@newcastle.edu.au
(02) 4921 7790
Consultation: Thursday 2pm-4pm at ES233.

Teaching Staff Other teaching staff will be advised on the course Blackboard site.

School Office **School of Electrical Engineering and Computing**
ICT307
ICT Building
Callaghan
+61 2 4921 5330
8.30am – 4.30pm (Monday to Friday)

SYLLABUS

Course Content 1. Basic concepts in software verification and validation
2. Software testing techniques (black-box testing, white-box testing, etc.)
3. Test adequacy and coverage criteria
4. Automated testing tools and techniques
5. Testing lifecycle and test management
6. Non-functional testing
7. Formal methods for software verification

Course Learning Outcomes **On successful completion of this course, students will be able to:**
1. Apply the concepts and theory related to software verification and validation.

2. Identify different testing techniques and design test plans, develop test suites, and evaluate test suite coverage

3. Use testing frameworks and testing tools.

Course Materials **Recommended Reading:**
- See Blackboard.

COMPULSORY REQUIREMENTS

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

Contact Hour Requirements:

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Course Assessment Requirements:

- Assessment 3 - Formal Examination: Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course. Students whose overall mark in the course is 50% or more, but who score less than 40% in the compulsory item and thus fail to demonstrate the required proficiency, will be awarded a Criterion Fail grade, which will show as FF on their formal transcript. However, students in this position who have scored at least 25% in the compulsory item will be allowed to undertake a supplementary 'capped' assessment in which they can score at most 50% of the possible mark for that item.

Pre-Placement Requirements:

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ASSESSMENTS

This course has 3 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Assignment 1	See Blackboard.	Individual	25%	1, 2
2	Assignment 2	See Blackboard.	Individual	25%	1, 2
3	Formal Examination*	During Formal Exam Period.	Individual	50%	1, 2, 3

* 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 - Assignment 1

Assessment Type	Written Assignment
Description	
Weighting	25%
Due Date	See Blackboard.
Submission Method	Online
Assessment Criteria	To be provided with project specification.
Return Method	Not Returned
Feedback Provided	

Assessment 2 - Assignment 2

Assessment Type	Written Assignment
Description	
Weighting	25%
Due Date	See Blackboard.
Submission Method	Online
Assessment Criteria	To be provided with project specification.
Return Method	Not Returned
Feedback Provided	

Assessment 3 - Formal Examination

Assessment Type	Formal Examination
Description	
Weighting	50%
Compulsory Requirements	Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course.
Due Date	During Formal Exam Period.
Submission Method	Formal Exam
Assessment Criteria	
Return Method	Not Returned
Feedback Provided	
Opportunity to Reattempt	Students WILL be given the opportunity to reattempt this assessment. Refer to course outline for details.

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).

Communication Methods

Communication methods used in this course include:

- Blackboard Course Site: Students will receive communications via the posting of content or announcements on the Blackboard course site.

Course Evaluation

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.

Academic Misconduct

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 <https://policies.newcastle.edu.au/document/view-current.php?id=35>.

**Adverse
Circumstances**

You are entitled to apply for special consideration because adverse circumstances have had an impact on your performance in an assessment item. This includes applying for an extension of time to complete an assessment item. Prior to applying you must refer to the Adverse Circumstances Affecting Assessment Items Procedure, available at <https://policies.newcastle.edu.au/document/view-current.php?id=236>. All applications for Adverse Circumstances must be lodged via the online Adverse Circumstances system, along with supporting documentation.

**Important Policy
Information**

The 'HELP for Students' tab in UoNline contains important information that all students should be familiar with, including various systems, policies and procedures.

Graduate Profile Statement

	University of Newcastle Bachelor of Engineering Graduate Profile Statements	Taught	Practised	Assessed	Level of capability
	Knowledge Base				
1	1.1. Comprehensive, theory based understanding of the underpinning natural and physical sciences and the engineering fundamentals applicable to the engineering discipline.				
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.				
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	✓	✓	✓	3
4	1.4. Discernment of knowledge development and research directions within the engineering discipline.	✓	✓	✓	3
5	1.5. Knowledge of contextual factors impacting the engineering discipline.	✓	✓	✓	3
6	1.6. Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline.	✓	✓	✓	3
	Engineering Ability				
7	2.1. Application of established engineering methods to complex engineering problem solving.	✓	✓	✓	4
8	2.2. Fluent application of engineering techniques, tools and resources.	✓	✓	✓	4
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.				
	Professional Attributes				
11	3.1. Ethical conduct and professional accountability	✓	✓	✓	3
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.	✓	✓	✓	3
15	3.5. Orderly management of self, and professional conduct.				
16	3.6. Effective team membership and team leadership.	✓	✓	✓	3

This course outline was approved by the Head of School. 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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