School of Information and Physical Sciences

SENG2050: Web Engineering

Callaghan
Semester 1 - 2022

COURSE OUTLINE

OVERVIEW

Course Description

This course introduces students to the discipline of web Engineering including the methods and techniques used in web-based system development. In contrast to traditional software engineering, web engineering methods and techniques must incorporate unique aspects of the problem domain such as: document-oriented delivery, fine-grained lifecycles, user-centric development, client-server legacy system integration and diverse end user skill levels. This course draws upon previous programming and computing experience to develop practical web development and maintenance skills. This course is intended for students with knowledge of both Internet communication concepts and an introductory programming knowledge (Java & Javascript).

Assumed Knowledge

SENG1110 and INFT1004 or equivalent, and SENG1050

Contact Hours

Callaghan
Computer Lab
Face to Face On Campus
2 hour(s) per Week for Full Term

Lecture
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.

CONTACTS

Course Coordinator

Callaghan
A/Pr Yuqing Lin
Yuqing.Lin@newcastle.edu.au
(02) 4921 6076
Consultation: Monday 11am-12noon in ES229

Teaching Staff

Other teaching staff will be advised on the course Canvas site.

School Office

School of Information and Physical Sciences
SR233, Social Sciences Building
Callaghan
CESE-SIPS-Admin@newcastle.edu.au
+61 2 4921 5515
8:30am – 4:30pm (Tues, Wed, Fri)

School of Information and Physical Sciences
ES222a Engineering Sciences Building
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+61 2 4921 5515
8:30am – 4:30pm (Mon, Thurs)

SYLLABUS

Course Content

1. Design methodologies to support web-based software systems
2. Development and maintenance models for web-based software systems
3. Server-side programming and web application frameworks
4. System security for web-based software systems
5. Techniques to support mobile devices

Course Learning Outcomes

On successful completion of this course, students will be able to:

1. Develop a web application using server-side programming languages and components.

2. Apply the web engineering methodologies for Web application development

3. Develop a component-based web solution and use UML diagrams to describe such a solution.

4. Identify and discuss the security risk of a Web application.

Course Materials

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COMPULSORY REQUIREMENTS

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

Course Assessment Requirements:

- Assessment 4 - 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.

SCHEDULE

Week	Week Begins	Topic	Learning Activity	Assessment Due
1	21 Feb	Course Overview, HTML and JavaScript		
2	28 Feb	Java Servlet		
3	7 Mar	Servlet and JSP	Computer Labs	
4	14 Mar	JSP and Java Beans	Computer Labs	Assignment 1
5	21 Mar	MVC and more JSP	Computer Labs	
6	28 Mar	JDBC	Computer Labs	
7	4 Apr	Web Engineering	Computer Labs	Assignment 2
Mid-Term Break				
Mid-Term Break				
8	25 Apr	Requirements Engineering and UWE	Computer Labs	
9	2 May	UWE and Web Engineering Process	Computer Labs	
10	9 May	Authentication, Authorisation and Security	Computer Labs	
11	16 May	MVC Framework	Computer Labs	
12	23 May	Revision		Group Project
13	30 May			
Examination Period				
Examination Period				

ASSESSMENTS

This course has 4 assessments. Each assessment is described in more detail in the sections below.

	Assessment Name	Due Date	Involvement	Weighting	Learning Outcomes
1	Programming Assignment 1	Sunday Week 4	Individual	15%	1
2	Programming Assignment 2	Sunday Week 7	Individual	15%	1
3	Group Project	Sunday Week 12	Group	35%	1, 2, 3, 4
4	Formal Examination*	Scheduled 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 - Programming Assignment 1

Assessment Type Written Assignment
Purpose Programming assignments which meet the course objectives of Knowledge Acquisition and Design of Solutions by developing web based programs. These assignments improve the design and programming skill of the students for the web based applications.
Description Developing a Web Application using Servlet.
Weighting 15%
Due Date Week 4
Submission Method Online
Assessment Criteria
Return Method Not Returned
Feedback Provided Online

Assessment 2 - Programming Assignment 2

Assessment Type Written Assignment
Purpose Programming assignments meet the course objectives of Knowledge Acquisition and Design of Solutions by developing web-based programs. These assignments improve the design and programming skill of the students for the web-based applications.
Description Developing a Web Application using JSPs
Weighting 15%
Due Date Week 7
Submission Method Online
Assessment Criteria
Return Method Not Returned
Feedback Provided Online

Assessment 3 - Group Project

Assessment Type Project
Purpose The group project stimulates the real-world application development and will give students some experiences of large web system development and also documentation standards. It will improve students' communication skills and ability to work in a team.
Description
Weighting 35%
Due Date Week 12
Submission Method Online
Assessment Criteria
Return Method Not Returned
Feedback Provided Online

Assessment 4 - Formal Examination

Assessment Type Formal Examination
Purpose The final formal examination is designed to test the individual student's knowledge of the course material and their ability to describe, analyse and hypothesis from this material.
Description
Weighting 35%
Compulsory Requirements Minimum Grade / Mark Requirement - Students must obtain a specified minimum grade / mark in this assessment item to pass the course.
Due Date Scheduled exam period
Submission Method Formal Exam
Assessment Criteria
Return Method Not Returned
Feedback Provided No Feedback
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:

- Canvas Course Site: Students will receive communications via the posting of content or announcements on the Canvas course site.
- Email: Students will receive communications via their student email account.

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.

Oral Interviews

As part of the evaluation process of any assessment item in this course an oral examination 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 Oral Examination Guidelines. 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 Student Conduct Rule.

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

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:

1. the assessment item is a major assessment item; or
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;
3. you are requesting a change of placement; or
4. the course has a compulsory attendance requirement.

Before applying you must refer to the Adverse Circumstance Affecting Assessment Items Procedure available at:
https://policies.newcastle.edu.au/document/view-current.php?id=236

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 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 -Graduate Attributes).

The following table illustrates how this course contributes towards building the skills students will need to work in their profession.

Level of capability

- Level 1 indicates an introduction to a topic at a university level
- Levels 2 and 3 indicate progressive reinforcement of that topic
- Level 4 indicates skills commensurate with a graduate – entry to professional practice
- Level 5 indicates highly specialist or professional ability

	University of Newcastle Bachelor of Engineering Graduate Profile Statements	Taught	Practised	Assessed	Level of capability
	Knowledge Base				
1	1.1 A sound knowledge of engineering fundamentals and the sciences which underpin them				
2	1.2 An in-depth technical competence in at least one engineering specialisation	X	X	X	2
3	1.3 The necessary skills to apply technologies and resources in engineering problem solving	X	X	X	2
4	1.4 An appreciation of the broad range of issues which impact on the engineering domain as a component of our society				
	Engineering Ability				
5	2.1 An ability to undertake problem identification, formulation and solution	X	X	X	2
6	2.2 An understanding of social, cultural, global and environmental responsibilities and the need to employ principles of sustainable development	X	X		2
7	2.3 An ability to utilise a systems approach to complex problems and to design and operation performance				
8	2.4 A proficiency in engineering design				
9	2.5 An ability to conduct an engineering project	X	X	X	2
10	2.6 An understanding of the business environment and the ability to employ business principles within engineering projects				
	Professional Attributes				
11	3.1 An ability to communicate effectively with the engineering team and with the community at large	X	X	X	2
12	3.2 An ability to manage information and documentation				
13	3.3 A capacity for creativity and innovation				
14	3.4 An understanding of professional and ethical responsibilities and a commitment to them				
15	3.5 An ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member	X	X	X	2
16	3.6 A capacity for lifelong learning and professional development				
17	3.7 The ability to demonstrate the knowledge,				

	skills and attitudes of a professional engineer				

Graduate Profile Statements – Computer Science

The following table illustrates how this course contributes towards building the skills students will need to work in their profession.

Level of capability

- Level 1 indicates an introduction to a topic at a university level
- Levels 2 and 3 indicate progressive reinforcement of that topic
- Level 4 indicates skills commensurate with a graduate – entry to professional practice
- Level 5 indicates highly specialist or professional ability

Graduate Attributes	University of Newcastle Bachelor of Computer Science Graduate Profile Statements	Taught	Practised	Assessed	Level of capability
1	Knowledge of basic science and computer science fundamentals	X	X	X	2
2	In depth technical competence in the discipline of computer science				
3	An ability to carry out problem analysis, requirements capture, problem formulation and integrated software development for the solution of a problem	X	X	X	2
4	Capacity to continue developing relevant knowledge, skills and expertise in computer science throughout their careers	X	X	X	2
5	An ability to communicate effectively with other Computer Scientists, Software Engineers, other professional disciplines, managers and the general community	X	X	X	2
6	Ability to undertake and coordinate large computer science projects and to identify complex problems, their formulation and solution	X	X	X	2
7	Ability to function effectively as an individual, a team member in multidisciplinary and multicultural teams and as a leader/manager with capacity to assist and encourage those under their direction	X	X	X	2
8	Understanding of social, cultural, global and business opportunities of the professional computer scientist; understanding the need for and principles of sustainability and adaptability	X	X		
9	Understanding of professional and ethical responsibilities and a commitment to them				
10	Understanding of entrepreneurship; need of and process of innovation, as well as the need of and capacity for lifelong learning				

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.