

## SENG4400: Enterprise Software Architectures

Callaghan

Semester 1 - 2024



THE UNIVERSITY OF  
NEWCASTLE  
AUSTRALIA

## OVERVIEW

<b>Course Description</b>	The role of the enterprise software architect is to exert external influence and control over individual software projects, to create an enduring order and consistency within the enterprise software suite. The architect must consider both the overall organization, and the goals of each individual project. The enterprise software architecture is the main tool that allows the architect to balance these quite different requirements. In this course students learn about the history of enterprise architectures, including enterprise-wide IT standards, enterprise data model (EDM), and attempts to formalise communication between software modules using middleware standardisation. Service-oriented architecture (SOA) is then presented as a paradigm that allows truly independent (functionally and technologically) components to be created and made available for use. Each of these components is strongly related to the business functionality it models.
<b>Academic Progress Requirements</b>	Nil
<b>Assumed Knowledge</b>	Exposure to Web and/or distributed computing concepts, Java programming and building software solutions.
<b>Contact Hours</b>	<b>Callaghan Computer Lab</b> Face to Face On Campus 2 hour(s) per week(s) for 13 week(s) starting Week 1  <b>Lecture</b> Face to Face On Campus 2 hour(s) per week(s) for 13 week(s) starting Week 1
<b>Unit Weighting Workload</b>	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

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# CONTACTS

**Course Coordinator**     **Callaghan**  
Dr Mark Wallis  
Mark.Wallis@newcastle.edu.au  
Consultation:

**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  
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9am-5pm (Mon-Fri)

# SYLLABUS

**Course Content**             Topics for this course include:

- Frameworks and ontologies for definition of enterprise architectures,
- Component architecture, model-driven architecture, and object constraint language,
- Enterprise application servers,
- Service-oriented architecture,
- Web service standards,
- The enterprise service bus.

**Course Learning Outcomes**     **On successful completion of this course, students will be able to:**

1. Recognize the need for an enterprise-wide coordinated view of the software deployed within an organisation, and the history of attempts to provide such a view
2. Discuss the role of the service-oriented architecture (SOA), particularly in producing components that are business functionality aligned, whilst also facilitating re-use and integration into the overall corporate IT system architecture
3. Apply web service standards (WS\*) to the implementation of SOAs
4. Explain the role of the web service bus in providing communication between components
5. Design and construct an example enterprise software architecture through completion of a major project.

## Course Materials

# 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 4 - Formal Examination: Pass requirement - Must pass this assessment item to pass the course.

**Compulsory Placement and WHS Requirements:**

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# SCHEDULE

## 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	Assignment 1		Individual	20%	2, 3
2	Assignment 2		Individual	20%	2, 3, 4
3	In term exam		Individual	20%	2, 3, 4, 5
4	Formal Examination*		Individual	40%	1, 2, 3, 4, 5

\* 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** Project  
**Description**  
**Weighting** 20%  
**Due Date**  
**Submission Method**  
**Assessment Criteria**  
**Return Method**  
**Feedback Provided**

### Assessment 2 - Assignment 2

**Assessment Type** Project  
**Description**  
**Weighting** 20%  
**Due Date**  
**Submission Method**  
**Assessment Criteria**  
**Return Method**  
**Feedback Provided**

### Assessment 3 - In term exam

**Assessment Type** In Term Test  
**Description**  
**Weighting** 20%  
**Due Date**  
**Submission Method**  
**Assessment Criteria**  
**Return Method**  
**Feedback Provided**

### Assessment 4 - Formal Examination

**Assessment Type** Formal Examination  
**Description**

<b>Weighting</b>	40%
<b>Compulsory Requirements</b>	Pass requirement - Must pass this assessment item to pass the course..
<b>Due Date</b>	
<b>Submission Method</b>	
<b>Assessment Criteria</b>	
<b>Return Method</b>	
<b>Feedback Provided</b>	
<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).

### Communication Methods

Communication methods used in this course include:

### 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 (Vivas)

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 [Oral Examination \(viva\) Procedure](#). 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 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 <https://www.newcastle.edu.au/current-students/respect-at-uni/policies-and-procedures> that support a safe and respectful environment at the University.

### Graduate Profile Statements

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

#### Bachelor of Comp Sci (Hons)

	University of Newcastle Computer Science (Honours) Graduate Profile Statements	Taught	Practised	Assessed	Level of Capability
1	Advanced and in depth knowledge of computer science fundamentals directed towards an ability to undertake research projects in at least one area of computer science.	X	X	X	4
2	Ability to communicate effectively with researchers in computer science and related fields.				
3	Advanced technical competencies in a discipline of computer science and the capacity to undertake postgraduate research.	X	X	X	4
4	Ability to apply advanced concepts in research and development within the information communication and technology (ICT) industry.	X	X	X	4
5	Ability to undertake in depth, self-directed analysis (such as literature reviews) of the current level of knowledge in any area of computer science.				

#### Bachelor of Engineering

	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.	X	X	X	4
2	1.2. Conceptual understanding of the, mathematics, numerical analysis, statistics, and computer and information sciences which underpin the engineering discipline.	X	X	X	4
3	1.3. In-depth understanding of specialist bodies of knowledge within the engineering discipline.	X	X	X	4
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.				
	<b>Engineering Ability</b>				
7	2.1. Application of established engineering methods to complex engineering problem solving.	X	X	X	4
8	2.2. Fluent application of engineering techniques, tools and resources.	X	X	X	4
9	2.3. Application of systematic engineering synthesis and design processes.	X	X	X	4
10	2.4. Application of systematic approaches to the conduct and management of engineering projects.	X	X	X	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.				
15	3.5. Orderly management of self, and professional conduct.	X	X	X	4
16	3.6. Effective team membership and team leadership.				

*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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