

## 32549 Advanced Internet Programming

**Course area** UTS: Information Technology

**Delivery** Spring 2018; City

**Credit points** 6cp

**Requisite(s)** [32516](#) Internet Programming

These requisites may not apply to students in certain courses. See [access conditions](#).

**Result type** Grade and marks

Attendance: 3hpw (laboratory)

### Subject coordinator

Benjamin Johnston

Email: [Benjamin.Johnston@uts.edu.au](mailto:Benjamin.Johnston@uts.edu.au)

Questions regarding assessment or content within the subject are welcome in lectures or tutorials or alternatively post them to the discussion board in UTS Online. This helps ensure that all students get the benefit of the answers given.

The Subject Coordinator may be contacted by email if you have matters of a personal nature to discuss, e.g., illness, study problems, and for issues to do with extensions, group problems or other matters of importance.

All emails sent to subject coordinators, tutors or lecturers must have a clear subject line that states the subject number followed by the subject of the email [e.g. Subject 32702, Request for Extension], and must be sent from your UTS email address.

Consultation hours: Check the UTSONline Contact section for details on consultation hours. Requests for appointments outside the given consultation hours may be arranged where circumstances require, and to do so please contact the subject coordinator by email.

### Teaching staff

Benjamin Johnston (Subject Coordinator, Tutor)

Email: [Benjamin.Johnston@uts.edu.au](mailto:Benjamin.Johnston@uts.edu.au)

Tutor (TBD)

### Subject description

In this subject students create sophisticated web applications for deployment to production. The subject provides knowledge and skills in advanced internet technologies particularly related to server-side internet programming and business-to-business systems. It covers topics relevant to advanced internet programming including web development stacks, n-tier architectures, standards, transactions, security, dependency injection, layering, web-service integration, and deployment.

The subject is run as a simulation of a technology-based startup or an in-house software development project. Students create a prototype for a simple idea. Throughout the session, students iteratively improve their prototype and apply the subject content to ensure that their prototype is secure, reliable, maintainable, well-designed and can handle real-world customers. Hands-on laboratory exercises and group activities give students practice in internet programming and develop their ability to problem-solve, collaborate and develop communication skills. Outside class, students are required to engage in self-directed learning and with their professional community.

### Subject learning objectives (SLOs)

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

1. Implement a medium sized web application incorporating multiple data sources, transaction integrity, data and application security;

2. Describe at a conceptual level, a full e-commerce application;
3. Describe the components that make up a multi-tier web based application, including application servers;
4. Describe the features of a web based application system that provides scalability, robustness, high availability and security;
5. Explain how transactions are used in web applications;
6. Introduce security features to web applications;
7. Compare and contrast competing web application architectures and list their advantages and disadvantages;

## Course intended learning outcomes (CILOs)

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

- Identify, interpret and analyse stakeholder needs. (A.1)
- Identify and apply relevant problem solving methodologies (B.1)
- Design components, systems and/or processes to meet required specifications (B.2)
- Synthesise alternative/innovative solutions, concepts and procedures (B.3)
- Implement and test solutions (B.5)
- Demonstrate research skills (B.6)
- Apply abstraction, mathematics and/or discipline fundamentals to analysis, design and operation (C.1)
- Develop models using appropriate tools such as computer software, laboratory equipment and other devices (C.2)
- Self-management - Graduates must have capabilities for self-organisation, self-review, personal development and lifelong learning. (D.0)
- Manage own time and processes effectively by prioritising competing demands to achieve personal goals (D.1)
- Communicate effectively in ways appropriate to the discipline, audience and purpose. (E.1)
- Work as an effective member or leader of diverse teams within a multi-level, multi-disciplinary and multi-cultural setting (E.2)

## Teaching and learning strategies

There is a 3 hour laboratory session each week.

Required preparation for the laboratory session includes preparatory tasks such as programming challenges and independent research activities. The preparation may also include online readings or videos. These tasks are released on UTSONline in the week before the laboratory session in which they are due. Further independent study is also expected.

The laboratory session typically consists of three parts:

1. **A reflective analysis and discussion of the preparation task.** Prior preparation is important for your involvement in this discussion.
2. **A series of hands-on activities.** Each week a series of technical, design, analysis, reflection or research problem is presented. The problem will challenge your understanding of the subject material and develop the understanding, skills and behaviours you need to succeed in the assignments. You will be working in small groups during the activities.
3. **An open-ended support session.** Your tutor is available assist with any difficulties and provide feedback on your progress. This time may also be used to answer questions about your assignments.

The reflective analysis (1) and hands-on activities are assessed according to criteria appropriate to each problem. Solutions are discussed through presentations and/or class discussion (as appropriate). Failure to prepare prior to class may result in a grade of zero for that week.

UTSONline may be used for ongoing discussion outside of the classroom.

## Content (topics)

Topics covered include:

- Web development stacks
- Templating languages
- Web services
- Layered design
- Databases and database access layers
- Security
- Transactions
- SOAP and RESTful web services
- System architectures
- Deployment to production
- Scalability
- Asynchrony and Messaging
- Emerging Trends

## Program

Week/Session	Dates	Description
1	23 Jul	Introduction, skills portfolio and professional software development tooling
2	30 Jul	Choosing a stack, HTTP and REST
3	6 Aug	Good code, state, advanced JavaScript  <b>Notes:</b> Assessment 1 in-class activity
4	13 Aug	Databases and persistence  <b>Notes:</b> Assessment 1 in-class activity
5	20 Aug	Good design, Security, validation  <b>Notes:</b> Assessment 1 in-class activity
6	27 Aug	Layering, web services  <b>Notes:</b> Assessment 1 in-class activity

7	3 Sept	Media
		<b>Notes:</b> Assessment 1 in-class activity
StuVac	10 Sept	StuVac
8	17 Sept	Performance and scalability
		<b>Notes:</b> Assessment 1 in-class activity Last date for Assessment 2 Video presentation
9	24 Sept	Deploying, benchmarking, iteration and performance improvement
		<b>Notes:</b> Assessment 1 in-class activity
10	1 Oct	Transactions and consistency
		<b>Notes:</b> Public holiday on Monday: a substitute class for Monday tutorials will be held in StuVac on 22 October 2018
11	8 Oct	Functionality demos, feedback
		<b>Notes:</b> Assessment 3 system demonstration presentations
12	15 Oct	Reflection and next steps
		<b>Notes:</b> Assessment 1 in-class activity

## Assessment

Please refer to the assessment task descriptions on UTS Online for late submission penalties.

You must use a source code management / revision control system and regularly commit changes. It is a requirement to check-in each iteration of your code at least once per week. Failure to do this will result in a penalty as specified in the assignment requirements document.

### Assessment task 1: Laboratory Exercises

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

1, 2, 3, 4, 5, 6 and 7

This assessment task contributes to the development of the following course intended learning outcomes (CILOs):

A.1, B.1, B.2, B.3, C.1, C.2, E.1 and E.2

**Type:** Laboratory/practical

**Groupwork:** Group, group and individually assessed

**Weight:** 30%

**Task:** Students will complete a preparatory task before each laboratory session. In the laboratory session, a series of activities and challenges will be presented. Students will form groups, solve the problem and present their solutions to their tutor or the class (as required) within the time allocated to the exercise. The assessment criteria and time for each activity is presented with each problem and feedback is provided immediately.

**Due:** Week 3 to Week 12  
Eight weekly laboratory sessions (weeks 3,4,5,6,7,8,9,12) will be assessed. Each week contributes 5% of the final grade, but only the highest six results are used for the calculation of this assessment component.

Criteria linkages:	Criteria	Weight (%)	SLOs	CILOs
	correctness/completeness of your implementation	33	1, 5, 6	A.1, B.1, B.3
	the quality of your design	33	3, 4, 7	B.2, C.1, C.2
	the quality of your explanation	34	2	E.1, E.2

SLOs: subject learning objectives

CILOs: course intended learning outcomes

**Further information:** Please note: Weighting of Assessment Criteria is approximate. Please see your subject guide for mark allocation

## Assessment task 2: Independent Study and Community Engagement

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

1, 2, 3, 4 and 7

This assessment task contributes to the development of the following course intended learning outcomes (CILOs):

B.1, B.2, B.6, C.1, D.0, D.1 and E.1

**Type:** Portfolio

**Groupwork:** Individual

**Weight:** 30%

<b>Task:</b>	<p>Throughout the session, students are expected to conduct independent study, engage other professionals and support other learners. Students might achieve these goals by, for example, asking and answering questions online, giving presentations, attending user group meetings, writing blog posts, learning new tools or experimenting with emerging technologies.</p> <p>Students will create a portfolio of evidence that demonstrates an ongoing commitment to learning and engagement. A template for the portfolio will be made available on UTS Online. The template will include a list of behaviours as well as guidelines for providing evidence that demonstrates this commitment. While there will be a small number of mandatory tasks, students will have freedom to design their learning in ways that they feel will most enhance their learning.</p> <p>Students are required to add to their portfolio every week.</p>			
<b>Due:</b>	<p>Week 2 to Week 12</p> <p>Students must add to their skills portfolio by Friday 11:59pm each week. Feedback on progress will be provided through in-class activities and at the student's request during class time. The final version of their skills portfolio is due on 2/11/2018, 11:59pm (i.e., Friday, first week of assessment period).</p>			
<b>Criteria linkages:</b>	Criteria	Weight (%)	SLOs	CILOs
	demonstration of ongoing commitment to learning	20	1, 3	B.6, D.0, D.1
	depth of understanding and insight into principles and technologies used in advanced internet programming	40	2, 4, 7	B.1, B.2, C.1
	ability to engage with and communicate professionally with technical peers	40	3	E.1
<p>SLOs: subject learning objectives CILOs: course intended learning outcomes</p>				
<b>Further information:</b>	<p>Please note: Weighting of Assessment Criteria is approximate. Please see the detailed assignment specification on UTS Online for mark allocations.</p>			

### Assessment task 3: Advanced Internet Project

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

1, 2, 3 and 7

This assessment task contributes to the development of the following course intended learning outcomes (CILOs):

B.1, B.2, B.3, B.5, B.6, C.1 and E.1

**Type:** Project

**Groupwork:** Group, group and individually assessed

**Weight:** 40%

**Task:**

- Students will design and implement a medium sized web application incorporating multiple data sources, transaction integrity, data and application security.
- This project will be carried out in self-formed groups or alone (with your tutor's approval).
- The deliverables will include both design documentation, revision control logs, source code and a working application that MUST be demonstrated in the labs. Submission details will be specified in the assignment handout.

- Detailed feedback will be provided verbally and electronically after submission

**Due:** In class in Week 11  
System functionality demonstrations are due in the Week 11 laboratory session. Students will have the opportunity to improve their code as a result of peer feedback for their final code submission by 19/10/2018, 11:59pm (i.e., Friday Week 12).

Criteria linkages:	Criteria	Weight (%)	SLOs	CILOs
	correctness/completeness of your implementation	33	1, 2, 3	B.3, B.5
	the quality of your design	33	1, 2	B.1, B.2, B.6, C.1
	the quality of your documentation	34	7	E.1

SLOs: subject learning objectives  
CILOs: course intended learning outcomes

**Further information:** Your system will be assessed as a group but marks will be assigned through a peer assessment process. The peer assessment incorporates contributions and evidence in your revision control logs (i.e., your individual commits). If you have trouble with the operation of your group, ask your tutors for advice (preferably ask as a group). If some of the group feels that other member(s) are not contributing, the tutor should be informed and a group meeting held to produce a solution.

Please note: Weighting of Assessment Criteria is approximate. Please see the detailed assignment specification on UTS Online for mark allocations.

## Required texts

There is no set textbook for this subject.

## Recommended texts

Fowler, M. (2003). Patterns of Enterprise Application Architecture. Addison-Wesley.

Crockford, D. (2008). JavaScript: The Good Parts: The Good Parts. O'Reilly Media.

## Other resources

Materials for this subject will be available at UTS Online: <http://online.uts.edu.au>

## Graduate attribute development

For a full list of the faculty's graduate attributes, refer to the FEIT [Graduate Attributes](#) webpage.

## Assessment: faculty procedures and advice

### 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 marks/grades and Final Results

If a student disagrees with a mark or a final result awarded by a marker:

- where a student wishes to query a mark, the deadline for a query during teaching weeks is 10 working days from the date of the return of the assessment task to the student
- where a student wishes to query a final examination result, the deadline is 10 working days from the official release of the final subject result.

Further information can be found at [Academic advice](#).

### 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.

The ALO for undergraduate students is:

[Chris Wong](#)

telephone +61 2 9514 4501

The ALO for postgraduate students is:

[Dr Nham Tran](#)

telephone +61 2 9514 4468

### Statement about assessment procedures and advice

This subject outline must be read in conjunction with the policy and procedures for the assessment for coursework subjects, available at: [www.gsu.uts.edu.au/policies/assessment-coursework.html](http://www.gsu.uts.edu.au/policies/assessment-coursework.html)

### 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.