School of Computing and Information Systems

Unit Outline

KXT309 Advanced Dynamic Web Development

Semester 1, 2010
Sandy Bay Campus, Hobart
Newnham Campus, Launceston

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Other people may take some of the tutorials in this unit. These people are all experienced in the subject area and will be briefed by the unit coordinator.

UNIT OVERVIEW

Introduction
In this unit you will learn concepts and skills that will enable you to develop well designed, efficient, and safe dynamic web applications that make use of server-side scripting and that can interact with both users and "back-end" data.

Prerequisites
KXT101 or KXT105 or KXT205

Unit Weight
12.5% of one academic year

Teaching Pattern
Lectures: 2 hr/week
Tutorials: 1 hr/week
Self Study Exercises: 1hr /week (There is no scheduled time for this - students will complete these activities at a time of their own convenience)
Video recorded Demonstrations (available via Lectopia): 1hr/week (most weeks)

Unit Content
<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
</tr>
</thead>
</table>
| 1    | Unit Introduction  
Overview of Client / Server concepts  
Overview of web programming concepts  
Internet Protocols |
| 2    | Compare static / dynamic web pages  
Writing php  
  - planning  
  - coding standards  
  - variables  
  - "input / output"  
  - built in functions  
  - built in objects |
| 3    | php - extended example showing  
  - using arrays  
  - writing and using functions  
  - using information from the query string  
Introduction to web security concerns |
| 4    | Collecting information from users  
  - Revise xhtml forms  
  - sending form information to the server  
  - using form information on the server side  
Form validation - compare client side / server side  
Maintaining state (HTTP is a stateless protocol) (mention only - more later)  
Security concerns when using forms - intro |
| 5    | Collecting information from users  
Maintaining state (HTTP is a stateless protocol)  
Security concerns when using forms  
Introduction to persistent data storage - files and databases  
php file functions - reading from files  
  - unix file permissions |
| 6    | Persistent data storage in files  
  - reading files  
  - writing to files  
File information  
Date and time information |
| 7    | Using php to set HTTP headers  
Authentication & Authorisation  
Overview of relational database concepts and their implementation in MySql |
| 8    | Concept of a session - session maintenance  
Using cookies - session maintenance and other purposes  
Extended examples |
| 9    | MySQL databases  
  - creating tables  
  - data types of fields  
  - inserting / altering / deleting data  
Using information from users to create database queries - security concerns |
| 10   | Authenticated sessions with passwords stored in a database  
Using php to produce content other than xhtml  
Creating images  
  - using php functions  
  - using libraries |
| 11   | Asynchronous interactions between clients & servers (AJAX)  
  - sending data to refresh part of a page  
  - methods of data transfer  
  - "mashups"  
Using third party APIs |
| 12   | Overview of web Architectures  
Searching iweb sites  
  - Search Engine Optimisation  
Consolidation of security related topics |
| 13   | Revision - overview of topics |
For more information see the section titled 'Content' on the unit website.

**Prior Knowledge and/or Skills**

Students will be expected to have the following (from prerequisite units and/or their own reading):

- An understanding of and ability to use basic programming constructs (variable including arrays, assignment operations, arithmetic operations, logical tests, branching flow of control, looping flow of control).
- An understanding of and ability to implement (X)html markup to create valid web pages that can be rendered by a browser.

**Learning Outcomes**

On successful completion of this unit, you will be able to:

1. Describe the structure of the messages that pass between web servers and clients and the protocols that are used. Explain the importance of each component of these messages and write PHP code that will use/create/modify parts of these messages as appropriate.
2. Write server-side scripts in PHP that:
   - Appropriately separate the business logic of the application from the presentation logic of the application.
   - Make appropriate use standard programming constructs so that the logic of the code is easy to follow.
   - Use pre-written functions and classes - including those built-in to PHP, those written by the programmer, and those available from third-party sources.
   - Make safe use of super global variables.
   - Comply with the coding standards required for this unit.
3. Create dynamic web applications by writing server-side scripts (using PHP) that correctly implement the following features:
   - Combining static and dynamic components in a web page.
   - Safe usage of data supplied by the client side.
   - Interaction with data sources (program variables, files, MySQL databases, third party sources).
   - State and session maintenance using a variety of techniques
   - Sending data to a client that can be used for a partial update of a web page.
4. Describe the security risks inherent in web based applications and explain (with practical demonstrations where appropriate) some techniques that can be used to minimise the risks.
5. Understand how web applications can combine content from a number of sources ("mashups")
   - Explain the difference between client side mashups and server side mashups.
   - Demonstrate a simple server side mashup that uses data stored on another server.
6. Discuss the relative roles of server side and client side programming in the development of "modern" web applications such as "Web2.0" type applications and Web Services

**Generic graduate attributes**

The university has defined a set of generic graduate attributes expected in its graduates. [http://www.utas.edu.au/policy/attributes_grads.pdf](http://www.utas.edu.au/policy/attributes_grads.pdf) Your course is designed to enable you to develop generic skills that are valued in, and expected of, graduates. These are skills that you will need to develop over time. Hence you are encouraged to look for opportunities, as you study each unit, to reflect on and improve these skills.

- Learn a new programming language and apply this language to develop dynamic Web pages;
- Identify a suitable technique for a given Web information management task;
- Conceptualize tasks to program in Web environment;
- Acknowledge the technical implications in online communication system.

**UNIT ASSESSMENT**

**Assessment Pattern**

Internal (40%), Exam (60%)

**Assessment Summary**

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutorial tests</td>
<td>10%</td>
<td>Tutorial Time in Weeks 3,6,12</td>
</tr>
<tr>
<td>Assignment 1</td>
<td>10%</td>
<td>Wednesday 17 April, at 3:00PM (Week 7)</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>20%</td>
<td>Wednesday 26 May, at 3:00PM (Week 13)</td>
</tr>
<tr>
<td>Exam</td>
<td>60%</td>
<td>University Examination Period</td>
</tr>
</tbody>
</table>

**Assessment Items**

**Item 1**  Title: Tutorial tests
Type: In-Semester - test
Task Length: Three (3) tests
Weighting: 10%
Links to Learning Outcomes: 1,2,3,4,5,6
Due: Tutorial Time in Weeks 3,6,12
Description: Each test will consist of some multiple choice questions and a small programming exercise both to be completed / demonstrated in tutorial time.

Item 2
Title: Assignment 1
Type: In-Semester - individual assignment
Task Length: not applicable
Weighting: 10%
Links to Learning Outcomes: 1,2,3
Due: Wednesday 17 April, at 3:00PM (Week 7)
Description: Develop a simple “dynamic” web application (web site) that makes use of server-side programming in PHP.

Item 3
Title: Assignment 2
Type: In-Semester - individual assignment
Task Length: not applicable
Weighting: 20%
Links to Learning Outcomes: 1,2,3,4
Due: Wednesday 26 May, at 3:00PM (Week 13)
Description: Extend the dynamic web site developed in assignment 1. Students will be expected to add various features such as (but not limited to):
- user authentication and authorisation
- session maintenance
- database "front end"
- simple server side "mashup"

Item 4
Title: Exam
Type: Formal Examination
Task Length: 3 hours
Weighting: 60%
Links to Learning Outcomes: 1,2,3,4,5,6
Due: University Examination Period
Description: Students will be permitted to take a single sheet of A4 paper (hand written on both sides) into the examination.

See the 'Assessment' section in unit website for more detailed information about assessment items.

How your Final Grade will be determined

Overall assessment will be based on the student's performance throughout the semester as well as in a formal examination. In order to achieve a pass (or better) result, a student must obtain:

1. at least 45% of the total mark for in-semester assessment items
2. at least 45% of the mark for the formal examination
3. at least 50% of the overall mark

UNIT RESOURCES

Unit Web Site

This unit is Web Dependent: content. This means that you will need to use the Web for this unit. The unit website contains unit information and resources.
The unit website is accessed from http://www.utas.edu.au/coursesonline/. You will need to use your university email pop account username and password to log on to the MyLO system. Once authenticated by the system your personalised MyLO Learning Online area will be displayed. It contains links to the websites that you have permission to access - including the website for this unit.
If you are not able to access the unit website, please contact the University IT help desk:
Entrance Level, Morris Miller Library, Sandy Bay Campus;
Entrance Level, Launceston Campus Library, Newnham Campus.
Telephone: 6226 1818 and 1300 304 903.
The 1300 number is a local call from within Tas, with the exception of mobiles.
Email: servicedesk@utas.edu.au
Website: http://www.utas.edu.au/servicedesk/student/index.html

Prescribed Text


Readings

Web based materials and resources that will be referred to during the semester.

Software
The software that you will need to access the unit website and to study this unit, including general purpose software such as word processors, is provided on the computers in the School’s computing labs. If you intend to use software on other computers please check that the versions are compatible.

GENERAL RESOURCES

School Website
School of Computing and Information Systems - Faculty of Science, Engineering, and Technology.
http://www.cis.utas.edu.au

Faculty Website
Information and Resources for Faculty of Science, Engineering and Technology students are available on the faculty website at: http://www.utas.edu.au/scieng

University Website
Information and Resources for ‘Current Students’ are available on the university website at:
http://www.utas.edu.au/students/

School Help Desk
Contact the School Help Desk if you have any queries or problems with accessing, using, or printing from the computers in the School of Computing and Information Systems labs.

In Hobart the Help Desk is located on level 3 in the Centenary Building, and is open from 10:00am-12:00pm, and 2:00pm-4:00pm Monday-Friday. The phone number is 6226 2929.

In Launceston the Help Desk is located near the entrance to the computing labs and is open from 10:00am-12:00pm, and 2:00pm-4:00pm Monday-Friday. The phone number is 6324 3447.

Both help desks will accept queries over the phone outside the standard opening hours.

The computer labs at the Cradle Coast Campus are maintained by ITR - please contact the University Help Desk for assistance with these computers.

Computing Facilities
The School has PC labs (running Windows XP), Mac labs (running Mac OS X 10.5), and special purpose Networking labs at the Newnham and Sandy Bay campuses. All students are provided with logins for Windows, Macintosh and Unix environments. If you have not used these facilities before please contact the School Help Desk to collect your account details. If you would like to access these facilities after hours please contact the School Help Desk.

In Hobart, there will be 4 PC Labs, 2 Mac Labs, and 1 Networks Lab in the Centenary Building. In Launceston, there are 2 PC Labs, 1 Mac Lab, 1 Networks Lab, and one Multipurpose Lab in Building V.

Use of Facilities
Use of computing facilities provided by the School is subject to the School’s Ethics Guidelines, details of which are posted at http://www.cis.utas.edu.au/cisview/ethics.jsp. Copies of the guidelines are also available in all School labs. The School's facilities may only be used for study-related purposes, and may not be used for personal gain. Anti-social behaviour in labs such as game playing, viewing pornography, loud discussion, audio without the use of headphones, etc is strictly prohibited in all labs at all times. Eating, drinking, and smoking is not permitted in the labs. Before being granted access to the School's facilities, you will be required to sign a declaration that you have read and understand these guidelines, and that you will abide by them. Disciplinary action may be taken against students who violate the guidelines.

Learning Strategies
If you need assistance in preparing for study please refer to your tutor or lecturer. For additional information refer to the Learning Development website: http://www.utas.edu.au/learndev/

If you will be using MyLO for the first time and would like some information on how to use MyLO refer to the following website: http://www.utas.edu.au/coursesonline/mylo-support.htm

Some of the units you will study use videoconferencing to deliver lectures and tutorials. To enable you to get the best out of a videoconference please refer to the following guide: http://www.its.utas.edu.au/videoconf/vcstudentguide.pdf

Help resolving concerns about this unit
In the first instance you should contact your lecturer. If the matter is not resolved then you should contact the Head of School. If the matter is still unresolved and you would like to know who to contact or the procedures for resolving your concern refer to the following website: http://acserv.admin.utas.edu.au/complaints_info.html

The Hobart based Tasmanian University Union (TUU) or the Launceston/Burnie based Student Association (SA) may
also be able to assist.

The School reserves the right to alter the details contained in this Unit Outline. Students will be advised of changes to the outline via their University email account and it remains the responsibility of the student to check their email for such changes.

**Occupational Health and Safety**

The university is committed to providing a safe and secure teaching and learning environment. For more information see [http://www.admin.utas.edu.au/hr/ohs/pol_proc/](http://www.admin.utas.edu.au/hr/ohs/pol_proc/)

**University Services and Support**

If you are experiencing difficulties with your studies or assignments, have personal or life planning issues, disability or illness which may affect your course of study, you are advised to raise these with your lecturer in the first instance.

The University has staff available to assist you, such as the:

- Learning Development Advisor
- Student Counselor
- Careers Advisor
- Disability Officer

For more information and contact details see the Services and Support section on the University 'Current Students' web page: [http://www.utas.edu.au/students/](http://www.utas.edu.au/students/)

**GENERAL ASSESSMENT**

**Approach to Learning**

The University is committed to high standards of professional conduct in all activities, and holds its commitment and responsibilities to its students as being of paramount importance. Likewise, it holds expectations about the responsibilities students have as they pursue their studies within the special environment the University offers.

The University’s Code of Conduct for Teaching and Learning states:

> Students are expected to participate actively and positively in the teaching/learning environment. They must attend classes when and as required, strive to maintain steady progress within the subject or unit framework, comply with workload expectations, and submit required work on time.

You are expected to spend about 130 hrs studying in this unit - this includes attendance at scheduled teaching sessions. (For a 13 week semester this is, on average, 10 hr/wk.) This is the amount of study time that the 'typical' student will need to reach the level of competence and understanding required to fulfil the unit objectives. You are expected to:

- attend all scheduled teaching sessions, unless otherwise notified by the unit coordinator
- prepare for, and actively participate in all scheduled teaching sessions
- complete the assigned learning tasks
- review what has been learnt
- complete assessment items and submit them on time
- access and be familiar with the information and resources available on the unit website
- seek help from teaching staff if you have any questions or difficulties in studying this unit

You are encouraged to read the university's Code of Conduct for Teaching and Learning. Part A describes the 'Responsibility of the University to Students' and part B describes the 'Responsibilities of Students to the University'. [http://www.utas.edu.au/policy/code_conduct.pdf](http://www.utas.edu.au/policy/code_conduct.pdf)

It is expected that students will familiarise themselves with access and use of the MyLO system operated by the University for the electronic delivery of course materials, and for various forms of communication.

It is expected that students will consult email sent to their University email address at least twice a week for notices relating to the administration of the unit, and for notification of the results of assignments.

It is expected that students will read the background material specified in the course curriculum, will actively attend and participate in tutorials, and be prepared to discuss relevant issues arising with tutors, lecturers and fellow students.

**Student Expectations of the Unit**

Students enrolled in this Unit may reasonably expect the following:

1. To be able to contact a lecturer or tutor by electronic mail, to raise issues arising in the unit, either relating to content or student performance within the unit.
2. Subject to availability, to be able to discuss such issues in person with the lecturer or tutor.
3. That assignments will be marked and the marks will normally be returned within 3 weeks of due dates.
That all relevant notices regarding the administration of the unit, including any necessary changes, will be communicated to all students enrolled in the unit via email.

*These expectations are in addition to those specified in relevant University regulations.*

**Plagiarism**

Unless specifically stated in the specification of the assessment item provided on the unit website, it is required that:

- work submitted by a student is the work of that student alone OR
- where the assessment item is to be completed by a group of students, the work submitted by the group of students is the work of that group of students alone.

While students are encouraged to discuss the assignments in this unit and to engage in active learning from each other, it is important that they are also aware of the University's policy on plagiarism. Plagiarism is taking and using someone else’s thoughts, writings or inventions and representing them as your own; for example downloading an essay wholly or in part from the internet, copying another student’s work or using an author’s words or ideas without citing the source.

"**Plagiarism** is a form of cheating. It is taking and using someone else's thoughts, writings or inventions and representing them as your own; for example, using an author's words without putting them in quotation marks and citing the source, using an author's ideas without proper acknowledgment and citation, copying another student's work.

If you have any doubts about how to refer to the work of others in your assignments, please consult your lecturer or tutor for relevant referencing guidelines, and the academic integrity resources on the web at [http://www.academicintegrity.utas.edu.au](http://www.academicintegrity.utas.edu.au).

The intentional copying of someone else's work as one's own is a serious offence punishable by penalties that may range from a fine or deduction/cancellation of marks and, in the most serious of cases, to exclusion from a unit, a course or the University. Details of penalties that can be imposed are available in the Ordinance of Student Discipline – Part 3 Academic Misconduct, see [http://www.utas.edu.au/universitycouncil/legislation/](http://www.utas.edu.au/universitycouncil/legislation/).

The University and any persons authorised by the University may submit your assessable works to a plagiarism checking service, to obtain a report on possible instances of plagiarism. Assessable works may also be included in a reference database. It is a condition of this arrangement that the original author's permission is required before a work within the database can be viewed."

Referencing

The preferred text referencing systems for the School is the Harvard system (also referred to as the author-date system). In your written work you will need to support your ideas by referring to scholarly literature, works of art and/or inventions. For information on presentation of assignments, including referencing styles: [http://utas.libguides.com/referencing](http://utas.libguides.com/referencing)

It is important that you understand how to correctly refer to the work of others and maintain academic integrity. Failure to appropriately acknowledge the ideas of others constitutes academic dishonesty (plagiarism), a matter considered by the University of Tasmania as a serious offence. The university document on plagiarism contains information about referencing the work or ideas of others (see [http://www.utas.edu.au/plagiarism/](http://www.utas.edu.au/plagiarism/)).

Submissions

The details of the submission method (paper, electronic or other) for each assignment will be supplied in a separate assignment specification sheet. All in-semester assignment submissions (including electronic submissions) are to include an Assignment Cover Sheet which includes a statement confirming that the submission is your own work. The Assignment Cover Sheet is available from the School Help Desk in Launceston and Hobart, and on the School's website: [http://www.cis.utas.edu.au/cisview/resources.jsp](http://www.cis.utas.edu.au/cisview/resources.jsp).

Students must take responsibility for the correct submission of their assignments. Students are expected to adhere to the following procedure for submission:

- Submitted files MUST be checked by the student to ensure that correct submission of the file has been undertaken.
- Students are expected to notify the Lecturer WITHIN TWO HOURS of submission if their files have not been submitted correctly.
- Students must take responsibility for safely backing up of their own files during the academic year to ensure that no files are permanently lost.

Extensions

**Review of Assessment and Appeals**

1. It is expected that students will adhere to the following policy for review of any piece of continuous assessment.
   a. Within 5 days of the release of the assessment result, the student should request an appointment with the Lecturer. The student should be prepared to discuss specifically which section of the marking criteria they are disputing and why they consider the mark is inappropriate.
   b. Following this discussion, students may request a formal remark of the original submission (in accordance with Rule of Academic Assessment 111, clause 22.1). This remark will be undertaken, where practicable, by an alternative assessor.

**Complaints Procedure**

It is expected that students will adhere to the following policy for making any complaint or grievance directly related to a Unit:

a. In the first instance, students are to approach the Lecturer or Unit Coordinator concerned and arrange a time to speak with them about their concern.

b. If an issue remains unresolved, the student should approach the Head of School and arrange a time to speak with them about their concern.

If the School’s internal policy of complaints is unable to resolve an issue, students should consult Ordinance 8 Student Complaints for further direction, see [http://acserv.admin.utas.edu.au/complaints_info.html](http://acserv.admin.utas.edu.au/complaints_info.html)

**Formal Examination**

The formal examination is conducted by the University Registrar. The 'Current Students' section on the university website contains information about the conduct of, and timetable for, formal examinations.

**Final Grade**

Passing grades will be awarded based on the AVCC guidelines:

- PP at least 50% of the overall mark but less than 60%
- CR at least 60% of the overall mark but less than 70%
- DN at least 70% of the overall mark but less than 80%
- HD at least 80% of the overall mark

In order to comply with the benchmarks set by the Faculty of Science, Engineering & Technology for distribution of grades in units, both the in-semester and examination marks that students obtain may be adjusted either upwards or downwards. See [http://fcms.its.utas.edu.au/scieng/scieng/policies.asp](http://fcms.its.utas.edu.au/scieng/scieng/policies.asp) for details of the Faculty Assessment Guidelines.