ISYS301
Enterprise Systems Integration
S2 Day 2015
Dept of Computing

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## General Information

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TBD

Oldooz Dianat
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Credit points
3

Prerequisites
39cp including [(ISYS254(P) or COMP255(P) or ISYS227(P) or COMP227(P)) and (6cp(P) in COMP or ISYS or ACCG or STAT or BUS or BBA units at 200 level)]

Corequisites

Co-badged status
ITEC601
Unit description
This unit aims to provide an understanding of how information systems can be integrated into the overall business layer of an organisation. The unit focuses on methods and techniques to enhance the alignment of information systems with business strategy, objectives and processes. Issues covered include: process modelling, corporate modelling, workflow modelling, business process re-engineering, enterprise resource planning, business-to-business integration and supply chain management. Various technical approaches to tackling integration problems are discussed.

Learning Outcomes
1. Ability to acquire knowledge needed integrate new systems and processes of an organisation
2. Competence in IT strategic planning.
3. Ability to use various modelling techniques to describe information flows and processes in an organisation.
4. Competence in XML (eXtensible Markup Language) to web enable business applications.
5. Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1</td>
<td>5%</td>
<td>24 August 2015</td>
</tr>
<tr>
<td>Assignment 2</td>
<td>20%</td>
<td>11 September 2015</td>
</tr>
<tr>
<td>Group Project Brief</td>
<td>5%</td>
<td>2nd October 2015</td>
</tr>
<tr>
<td>Assignment 3</td>
<td>15%</td>
<td>23rd October 2015</td>
</tr>
<tr>
<td>Group presentation</td>
<td>5%</td>
<td>Week 12</td>
</tr>
<tr>
<td>Exam</td>
<td>50%</td>
<td>9-27th November 2015</td>
</tr>
</tbody>
</table>

Assignment 1
Due: 24 August 2015
Weighting: 5%

A report on eBusiness principles
This Assessment Task relates to the following Learning Outcomes:

- Ability to acquire knowledge needed to integrate new systems and processes of an organisation
- Competence in IT strategic planning.

Assignment 2
Due: 11 September 2015
Weighting: 20%

Business Process Modelling

This Assessment Task relates to the following Learning Outcomes:

- Ability to acquire knowledge needed to integrate new systems and processes of an organisation
- Competence in IT strategic planning.
- Ability to use various modelling techniques to describe information flows and processes in an organisation.

Group Project Brief
Due: 2nd October 2015
Weighting: 5%

Provide a description of the project and the role of each team member with some explanation. This will be marked individually.

This Assessment Task relates to the following Learning Outcomes:

- Ability to use various modelling techniques to describe information flows and processes in an organisation.

Assignment 3
Due: 23rd October 2015
Weighting: 15%

Group assignment implementing eBusiness solution. These will be peer moderated and marks assigned individually within the group. Groups will be self-selecting. If individuals have not allocated themselves to a group within a set time, people will be allocated to a group by the lecturer.

This Assessment Task relates to the following Learning Outcomes:
Ability to acquire knowledge needed to integrate new systems and processes of an organisation.

Ability to use various modelling techniques to describe information flows and processes in an organisation.

Competence in XML (eXtensible Markup Language) to web enable business applications.

Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).

Group presentation

Due: Week 12
Weighting: 5%

Group presentation, but each team member will be marked individually.

This Assessment Task relates to the following Learning Outcomes:

- Ability to acquire knowledge needed to integrate new systems and processes of an organisation.
- Ability to use various modelling techniques to describe information flows and processes in an organisation.
- Competence in XML (eXtensible Markup Language) to web enable business applications.
- Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).

Exam

Due: 9-27th November 2015
Weighting: 50%

Closed book exam

This Assessment Task relates to the following Learning Outcomes:

- Ability to acquire knowledge needed to integrate new systems and processes of an organisation.
- Competence in IT strategic planning.
- Ability to use various modelling techniques to describe information flows and processes in an organisation.
• Competence in XML (eXtensible Markup Language) to web enable business applications.

• Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).

Delivery and Resources

CLASSES

Each week you should attend three hours of lectures. The third hour of lecture on the Wednesday will be a tutorial. There will also be a one-hour practical class, although not every week and some practical times more in the second half of semester will be free for you to undertake your group assignment.

For details of days, times and rooms consult the timetables webpage.

Note that the practical classes commence in week 2.

You should have selected a practical class enrollment. It will not particularly matter if you do not attend the practical you are enrolled in as practical attendance is not compulsory, but should be useful to you. If you do not have a class, or if you wish to change one, you should see the enrollment operators in the E7B courtyard during the first two weeks of the semester. Thereafter you should go to the Student Centre.

REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

Textbook

The textbook for ISYS301 used this semester is:

• Papazoglou, M., Ribbers, P., (2006) e-Business: Organizational and Technical Foundations John Wiley & Sons Ltd. Chichester West Sussex U.K. There is also a companion website by the publisher at www.wiley.com. This site contains links to example material and more.

There are another couple of books you may wish to acquire, these are not compulsory but helpful.


The following are ‘weekly readings’ which simply support your learning, should you be interested in the topic and wish to read further. Of course they help with assignments as well!
- Eckhardt, A., Rosenkranz, C., (2010) "Lost in translation?!: the need for a boundary spanner between business and it" SIGMIS-CPR '10 May pp: 75-82.
- Heart, T., (2010) "Who is out there?: exploring the effects of trust and perceived risk on saas adoption intentions" SIGMIS Database 41(3) August pp: 49-68.


UNIT WEBPAGE AND TECHNOLOGY USED AND REQUIRED

echo360

Digital recordings of lectures are available. Read instructions here.

Technology

Technology used will include IBM BP Modeller, Adonis etc. Students are also expected to make use of MS Word, MS Excel and MS Powerpoint and editing software to undertake XML and BPEL.

Discussion Boards

When groups are allocated for the group assignment. Students will have the opportunity to discuss issues amongst their groups on iLearn.

Unit Schedule
<table>
<thead>
<tr>
<th>Week</th>
<th>World of eBusiness</th>
<th>No tutorial</th>
<th>No practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>eBusiness strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- What is eBusiness strategy</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Strategic positioning</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Level of eBusiness strategy</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>- Strategic alignment</td>
<td></td>
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</tr>
</tbody>
</table>

(Peter)

Week starts 27/7

Australian Government (2015)

Janita and Chong (2013)

Lai, Kan and Ulhas (2013)

Pihir (2013)

Kabak and Dogac (2010)

Eckhardt and Rosenkranz (2010)

Jacobs and Nakata (2010)

Papazoglou and Ribbers chapters 1, 2

http://unitguides.mq.edu.au/unit_offerings/45255/unit_guide/print
<table>
<thead>
<tr>
<th>2</th>
<th><strong>Business models</strong></th>
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</thead>
<tbody>
<tr>
<td>Peter</td>
<td>- Pressures forcing business changes</td>
</tr>
<tr>
<td>3/8</td>
<td>- Classifications of business models</td>
</tr>
<tr>
<td>eBusiness Relationships</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th><strong>Governance Structures</strong></th>
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<tbody>
<tr>
<td>Peter</td>
<td><strong>Business process modeling</strong></td>
</tr>
<tr>
<td>10/8</td>
<td>- Business process modelling methodologies</td>
</tr>
<tr>
<td></td>
<td>- Supply chain operations reference (SCOR) model</td>
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<td></td>
<td>- Model driven architecture (MDA)</td>
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<td></td>
<td>- Business process modelling notation (BPMN)</td>
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<table>
<thead>
<tr>
<th>2</th>
<th>Background to eBusiness</th>
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<tbody>
<tr>
<td>Peter</td>
<td>eBusiness strategy</td>
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</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Introduction to modelling</th>
</tr>
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<tbody>
<tr>
<td>Peter</td>
<td></td>
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<table>
<thead>
<tr>
<th>2</th>
<th>Papazoglou and Ribbers</th>
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</thead>
<tbody>
<tr>
<td>Peter</td>
<td>chapter 3, 4</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Ko (2009)</th>
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<tbody>
<tr>
<td>Peter</td>
<td>Ionita et al., (2008)</td>
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</table>

<table>
<thead>
<tr>
<th>3</th>
<th>eBusiness models</th>
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<tbody>
<tr>
<td>Peter</td>
<td>eBusiness relationships</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Assignment preparation</th>
</tr>
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<tbody>
<tr>
<td>Peter</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Papazoglou and Ribbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peter</td>
<td>chapter 5, 12</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
</tr>
<tr>
<td>-------</td>
<td>----------------------------------------------------------------------</td>
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<tr>
<td>4</td>
<td>Guest lecture by Professionals Australia (<a href="http://www.professionalsaustralia.org.au/">http://www.professionalsaustralia.org.au/</a>) on Tuesday 9-10am</td>
</tr>
<tr>
<td>5</td>
<td>Recorded lecture on Knowledge Management</td>
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<tr>
<td></td>
<td>(Peter)</td>
</tr>
<tr>
<td>6</td>
<td>eBusiness Technological Infrastructure</td>
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<td></td>
<td>(Peter)</td>
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<tr>
<td>7</td>
<td>XML EDI and Middleware - EDI concepts and standards</td>
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<tr>
<td></td>
<td>(Peter)</td>
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<td></td>
<td>7/9</td>
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<tr>
<td></td>
<td>Mid Semester Break: 12-27th September inclusive</td>
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<tr>
<td>Week</td>
<td>Topic</td>
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</tbody>
</table>
| 8    | Loosely coupled eBusiness solutions | - Concept of software as a service  
- Web services  
- Web service architecture  
| XML, EDI and Middleware  
Group project brief (5%) due 2nd October | Papazoglou and Ribbers chapter 19 |
| 9    | Workflow systems | - Workflow concepts  
- Workflow elements  
- Workflow modeling  
- Workflow verification  
| eBusiness solutions  
Business solutions, Workflow systems | Papazoglou and Ribbers chapters 18 |
| 10   | Enterprise Application Integration (EAI) | - Concepts  
- Technologies  
| Legacy systems  
Assignment work | Papazoglou and Ribbers chapter 17 |
| 11   | Leverage legacy applications |  
| Workflow systems  
Group assignment (15%) due 30th October | Papazoglou and Ribbers chapter 16 |
### Learning and Teaching Activities

#### Lectures 1 and 2
Covers lecture material every week

#### Lecture 3
Covers tutorial material every week

#### Practical
Covers practical components of the course in the computer labs

### Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](http://mq.edu.au/policy/docs). Students should be aware of the following policies in particular with regard to Learning and Teaching:


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<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
<th>Business protocols</th>
<th>eBusiness solutions</th>
<th>Group Presentations (5%)</th>
<th>Papazoglou and Ribbers chapter 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>(Oldooz)</td>
<td>Business protocols</td>
<td></td>
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<tr>
<td>26/10</td>
<td></td>
<td>- Why are business protocols and standards needed</td>
<td>- XML technology stack for eBusiness integration</td>
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<tr>
<td></td>
<td></td>
<td>- RosettaNet</td>
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<tr>
<td></td>
<td></td>
<td>- Electronic business XML</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>(Peter/ Oldooz)</td>
<td>Revision for the exam</td>
<td>Business protocols</td>
<td></td>
<td>No practical</td>
</tr>
<tr>
<td>2/11</td>
<td></td>
<td></td>
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</tbody>
</table>
In addition, a number of other policies can be found in the Learning and Teaching Category of Policy Central.

**Student Code of Conduct**

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student_conduct/](https://students.mq.edu.au/support/student_conduct/)

**Results**

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in *eStudent*. For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

**Late Assignment Submission policy:** Late work will be accepted with a penalty of 10% of the marks for the assignment per day submitted late. Hence, an assignment submitted five days late will get at most half the marks. If you cannot submit on time because of illness or other circumstances, please contact the lecturer **before** the due date.

**Student Support**

Macquarie University provides a range of support services for students. For details, visit [http://students.mq.edu.au/support/](http://students.mq.edu.au/support/)

**Learning Skills**

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- **Workshops**
- **StudyWise**
- **Academic Integrity Module for Students**
- **Ask a Learning Adviser**

**Student Enquiry Service**

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

**Equity Support**

Students with a disability are encouraged to contact the [Disability Service](http://students.mq.edu.au/support/) who can provide appropriate help with any issues that arise during their studies.

**IT Help**


When using the University’s IT, you must adhere to the [Acceptable Use Policy](http://informatics.mq.edu.au/help/). The policy applies to all who connect to the MQ network including students.
Graduate Capabilities

Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary solutions to problems.

This graduate capability is supported by:

Learning outcomes

- Competence in IT strategic planning.
- Ability to use various modelling techniques to describe information flows and processes in an organisation.
- Competence in XML (eXtensible Markup Language) to web enable business applications.
- Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).

Assessment tasks

- Assignment 2
- Assignment 3
- Group presentation
- Exam

Learning and teaching activities

- Covers lecture material every week
- Covers tutorial material every week
- Covers practical components of the course in the computer labs

Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:
Learning outcomes

• Competence in IT strategic planning.
• Ability to use various modelling techniques to describe information flows and processes in an organisation.
• Competence in XML (eXtensible Markup Language) to web enable business applications.

Assessment tasks

• Assignment 2
• Assignment 3
• Exam

Learning and teaching activities

• Covers tutorial material every week
• Covers practical components of the course in the computer labs

Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

Learning outcome

• Competence in IT strategic planning.

Assessment tasks

• Assignment 1
• Assignment 2
• Assignment 3
• Exam

Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess, write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:
Learning outcome

• Competence in IT strategic planning.

Assessment tasks

• Assignment 2
• Group Project Brief
• Assignment 3
• Group presentation
• Exam

Engaged and Ethical Local and Global citizens

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

Learning outcome

• Ability to acquire knowledge needed to integrate new systems and processes of an organisation

Learning and teaching activities

• Covers lecture material every week

Socially and Environmentally Active and Responsible

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

Learning outcome

• Ability to acquire knowledge needed to integrate new systems and processes of an organisation

Learning and teaching activities

• Covers lecture material every week
Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

Learning outcomes

• Ability to acquire knowledge needed integrate new systems and processes of an organisation
• Competence in IT strategic planning.

Assessment tasks

• Assignment 1
• Group Project Brief
• Assignment 3
• Group presentation
• Exam

Learning and teaching activities

• Covers tutorial material every week

Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

Learning outcomes

• Ability to acquire knowledge needed integrate new systems and processes of an organisation
• Competence in IT strategic planning.
• Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).
Assessment tasks

• Assignment 2
• Group Project Brief
• Assignment 3
• Exam

Learning and teaching activities

• Covers lecture material every week
• Covers tutorial material every week
• Covers practical components of the course in the computer labs

Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

Learning outcomes

• Ability to acquire knowledge needed integrate new systems and processes of an organisation
• Competence in IT strategic planning.
• Ability to use various modelling techniques to describe information flows and processes in an organisation.
• Competence in XML (eXtensible Markup Language) to web enable business applications.
• Competence in Web Services Description Language (WSDL) and Business Process Execution Language (BPEL).

Assessment tasks

• Group Project Brief
• Group presentation

Learning and teaching activities

• Covers lecture material every week
Changes from Previous Offering

Peter is lecturing for 60% (weeks 1-7) and Oldooz for 40% (weeks 8-12) of the course.

Assignment 2 (the key individual assignment) is now worth 20% up from 15%. However the group presentation (where members are nonetheless individually marked) is now only worth 5%. The logic for the decrease to 5% is because in fact each individual presents material for only 2-3 minutes within their group and so 10% is excessive for such a short period of time.

Grading

Standards

Four standards, namely HD, D, CR, P summarize as many different levels of achievement. Each standard is precisely defined to help students know what kind of performance is expected to deserve a certain mark. The standards corresponding to the learning outcomes of this unit are given below:

<table>
<thead>
<tr>
<th>L.O.</th>
<th>#1</th>
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http://unitguides.mq.edu.au/unit_offerings/45255/unit_guide/print
Criteria for **L.O. #2**

| Undertaking SWOT analysis | A limited understanding of what SWOT is and how it works, perhaps making a few simple mistakes | Competent analysis of SWOT for a given organisation listing a few each of S, W, O and T factors | Good SWOT analysis, with some recourse to the literature providing similar examples in the case of other organisations | Outstanding SWOT analysis with comprehensive recourse to the literature |

Criteria for **L.O. #3**

<p>| | | | | |
|  |  |  |  |  |</p>
<table>
<thead>
<tr>
<th>Criteria for L.O. #4</th>
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</thead>
<tbody>
<tr>
<td>understanding how use of code such as XML will enable ecommerce</td>
</tr>
<tr>
<td>limited understanding of what XML actually is and does, however showing some understanding of how XML enables ecommerce</td>
</tr>
<tr>
<td>competent understanding of XML, limited recourse to the literature, perhaps just relying on the textbook or lecture notes</td>
</tr>
<tr>
<td>good understanding of the role of XML, with some recourse to examples in the literature, beyond just knowledge of XML from the lecture notes</td>
</tr>
<tr>
<td>outstanding understanding of the role XML plays, with comprehensive recourse to the literature providing further examples beyond what was asked for in the assignment</td>
</tr>
<tr>
<td>Competence in XML</td>
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<tr>
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</tr>
<tr>
<td>Criteria for L.O. #5</td>
</tr>
<tr>
<td>Competence in WSDL and BPEL</td>
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</tbody>
</table>
For each task, those standards translate into a mark and the different component marks are added up. You will then be given a grade that reflects your achievement in the unit. The following description of the different grades is still in draft form and therefore not official as yet

- **Fail (F):** does not provide evidence of attainment of all learning outcomes. There is missing or partial or superficial or faulty understanding and application of the fundamental concepts in the field of study; and incomplete, confusing or lacking communication of ideas in ways that give little attention to the conventions of the discipline.

- **Pass (P):** provides sufficient evidence of the achievement of learning outcomes. There is demonstration of understanding and application of fundamental concepts of the field of study; and communication of information and ideas adequately in terms of the conventions of the discipline. The learning attainment is considered satisfactory or adequate or competent or capable in relation to the specified outcomes.

- **Credit (Cr):** provides evidence of learning that goes beyond replication of content knowledge or skills relevant to the learning outcomes. There is demonstration of substantial understanding of fundamental concepts in the field of study and the ability to apply these concepts in a variety of contexts; plus communication of ideas fluently and clearly in terms of the conventions of the discipline.

- **Distinction (D):** provides evidence of integration and evaluation of critical ideas, principles and theories, distinctive insight and ability in applying relevant skills and concepts in relation to learning outcomes. There is demonstration of frequent originality in defining and analysing issues or problems and providing solutions; and the use of means of communication appropriate to the discipline and the audience.

- **High Distinction (HD):** provides consistent evidence of deep and critical understanding in relation to the learning outcomes. There is substantial originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; critical evaluation of problems, their solutions and their implications; creativity in application.

You will pass the unit if you

- perform satisfactorily in the assignments. A pass will mean you have satisfied the requirements stated in the assignment specification. Higher grades will mean you have shown evidence of using the set literature, particularly at grades Distinction and High Distinction.
will be present and deliver some slides for your group presentation. Groups are only organised after the census date (31/8), therefore if you are allocated to a group, you are still considered formally enrolled in the course.

perform satisfactorily in the exam.

You stand a chance of failing if you do not submit satisfactory attempts at the assignments on time, you do not turn up at the group presentation without good reason and you do not perform satisfactorily in the exam.

Department of Computing expectations are that students have to perform satisfactorily in the final exam as well as in their internal work/assignments.