



# ISYS301

## Enterprise Systems Integration

S2 Day 2017

*Dept of Computing*

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## General Information

### Unit convenor and teaching staff

Convenor, Lecturer

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E6A 316

1-3 Thursdays

Lecturer

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TBD

Tutor, Marker, Prac demonstrator

Charanya Ramakrishnan

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Credit points

3

Prerequisites

39cp at 100 level or above including (ISYS224 or ISYS254 or COMP255)

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.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

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

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).

## Assessment Tasks

| Name                                | Weighting | Hurdle | Due                 |
|-------------------------------------|-----------|--------|---------------------|
| <a href="#">Assignment 1</a>        | 10%       | No     | 25th August 2017    |
| <a href="#">Assignment 2</a>        | 15%       | No     | 15th September 2017 |
| <a href="#">Group Project Brief</a> | 5%        | No     | 6th October 2017    |
| <a href="#">Assignment 3</a>        | 20%       | No     | 27th October 2017   |
| <a href="#">Exam</a>                | 50%       | Yes    | 14/11 - 2/12 2017   |

### Assignment 1

Due: **25th August 2017**

Weighting: **10%**

A report on eBusiness principles

On successful completion you will be able to:

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

## Assignment 2

Due: **15th September 2017**

Weighting: **15%**

Business Process Modelling

On successful completion you will be able to:

- 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: **6th October 2017**

Weighting: **5%**

Provide a description of the project and the role of each team member with some explanation.

On successful completion you will be able to:

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

## Assignment 3

Due: **27th October 2017**

Weighting: **20%**

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.

On successful completion you will be able to:

- 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: **14/11 - 2/12 2017**

Weighting: **50%**

**This is a hurdle assessment task (see [assessment policy](#) for more information on hurdle assessment tasks)**

The final examination in this unit is a hurdle requirement. You must get a mark of at least 40% in the examination to pass the unit. If you get a mark of at least 30% in your first attempt at the final examination you will be given a second and final attempt. If you apply for Disruption to Study for your final examination, you must make yourself available for the the week of **December 11 – 15 2017**. If you are not available during this period of time, there is no guarantee an additional examination time will be offered. Specific examination dates and times will be determined at a later date. Second-chance hurdle examinations will also be offered in the week of the week of **December 11 – 15**. You will be notified shortly after the grade is released of your eligibility for a hurdle retry and you must also make yourself available during that week to take advantage of this opportunity.

On successful completion you will be able to:

- 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 first two hours on the Tuesday will be standard lecture format. The third hour of lecture on the Thursday will act as a tutorial. There will also be a a one-hour practical class - although not every week and practical times 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 [comp anion website](#) by the publisher at [www.wiley.com](http://www.wiley.com). This site contains links to example material and more.

There are a few more books you may wish to acquire, these are not compulsory but potentially helpful.

- Busch, P., (2008) *Tacit Knowledge in Organizational Learning* IGI Global U.S.A.
- Chaffey, D., (2015) *Digital Business and E-Commerce Management: Strategy, Implementation and Practice* 6th Ed. Pearson Harlow U.K.
- Papazoglou, M., (2012) *Web Services & SOA: Principles and Technology* 2nd Ed. Pearson Harlow U.K.

## 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

|   |  |   |  |   |
|---|--|---|--|---|
| <p><b>1</b><br/><b>(Peter)</b><br/>Week starts 31/7</p> | <p><b>World of eBusiness</b><br/><b>eBusiness strategy</b></p> <ul style="list-style-type: none"> <li>- What is eBusiness strategy</li> <li>- Strategic positioning</li> <li>- Level of eBusiness strategy</li> <li>- Strategic alignment</li> </ul>   | <p>Background to eBusiness<br/>eBusiness strategy</p>             | <p>No practical</p>  | <p>Papazoglou and Ribbers chapters 1, 2</p> |
| <p><b>2</b><br/><b>(Peter)</b><br/>7/8</p>              | <p><b>Business models</b></p> <ul style="list-style-type: none"> <li>- Pressures forcing business changes</li> <li>- Classifications of business models</li> </ul> <p><b>eBusiness Relationships</b></p>   | <p>eBusiness models<br/>eBusiness relationships</p>               | <p>Introduction to modelling</p>   | <p>Papazoglou and Ribbers chapter 3, 4</p>  |
| <p><b>3</b><br/><b>(Peter)</b><br/>14/8</p>             | <p><b>Governance Structures</b><br/><b>Business process modeling</b></p> <ul style="list-style-type: none"> <li>- Business process modelling methodologies</li> <li>- Supply chain operations reference (SCOR) model</li> <li>- Model driven architecture (MDA)</li> <li>- Business process modelling notation (BPMN)</li> </ul> | <p>Governance structures<br/>Business process modelling</p>       | <p>Assignment preparation</p>  | <p>Papazoglou and Ribbers chapter 5, 12</p> |
| <p><b>4</b><br/><b>(Peter)</b><br/>21/8</p>             | <p><b>eBusiness Technological Infrastructure</b></p>   | <p>Technology infrastructure</p>                                  | <p>Modelling exercise</p>  | <p>Papazoglou and Ribbers chapter 6</p>     |
| <p><b>5</b><br/><b>(Peter)</b><br/>28/8</p>             | <p><b>Knowledge Management</b><br/><b>(Recorded lecture)</b></p>   | <p><a href="#">Professionals Australia</a> guest lecture 31/8</p> | <p>Assignment preparation<br/><b>Assignment 1 (5%) due 29th August</b></p> | <p>Busch (2008)</p>                         |
| <p><b>6</b><br/><b>(Peter)</b><br/>4/9</p>              | <p><b>Revision weeks 1-6</b></p>   |   | <p>Introduction to XML</p>   |   |

|  |   |                                |   |  |
|--|---|--------------------------------|---|--|
| <p><b>7</b></p> <p>(Jian)</p> <p>11/9</p>        | <p><b>XML</b></p> <p><b>EDI and Middleware</b></p> <ul style="list-style-type: none"> <li>- EDI concepts and standards</li> <li>- Middleware concepts, architecture and systems</li> </ul>  | <p>XML, EDI and middleware</p> | <p>XML</p> <p><b>Assignment 2 (20%) due 16th September</b></p>                | <p>Papazoglou and Ribbers chapters 7, 14</p> |
| <p><b>Mid Semester Break: 16/9 - 2/10</b></p>    |   |                                |   |  |
| <p><b>8</b></p> <p>(Jian)</p> <p>3/10</p>        | <p><b>Loosely coupled eBusiness solutions</b></p> <ul style="list-style-type: none"> <li>- Concept of software as a service</li> <li>- Web services</li> <li>- Web service architecture</li> </ul>  | <p>eBusiness solutions</p>     | <p>XML, Middleware</p> <p><b>Group project brief (5%) due 4th October</b></p> | <p>Papazoglou and Ribbers chapter 19</p>     |
| <p><b>9</b></p> <p>(Jian)</p> <p>9/10</p>        | <p><b>Workflow systems</b></p> <ul style="list-style-type: none"> <li>- Workflow concepts</li> <li>- Workflow elements</li> <li>- Workflow modeling</li> <li>- Workflow verification</li> </ul>   | <p>Workflow solutions</p>      | <p>Business solutions, Workflow systems</p>                                   | <p>Papazoglou and Ribbers chapters 18</p>    |
| <p><b>10</b></p> <p>(Jian)</p> <p>16/10</p>      | <p><b>Enterprise Application Integration (EAI)</b></p> <ul style="list-style-type: none"> <li>- Concepts</li> <li>- Technologies</li> </ul>   | <p>EAI</p>                     | <p>Assignment work</p>  | <p>Papazoglou and Ribbers chapter 17</p>     |
| <p><b>11</b></p> <p>(Jian)</p> <p>23/10</p>      | <p><b>Leverage legacy applications</b></p>  | <p>Legacy applications</p>     | <p><b>Group assignment (15%) due 28th October</b></p>                         | <p>Papazoglou and Ribbers chapter 16</p>     |
| <p><b>12</b></p> <p>(Jian)</p> <p>30/10</p>      | <p><b>Business protocols</b></p> <ul style="list-style-type: none"> <li>- Why are business protocols and standards needed</li> <li>- XML technology stack for eBusiness integration</li> <li>- RosettaNet</li> <li>- Electronic business XML</li> </ul> | <p>Business protocols</p>      | <p>No practical</p>   | <p>Papazoglou and Ribbers chapter 20</p>     |
| <p><b>13</b></p> <p>(Peter/Jian)</p> <p>6/11</p> | <p><b>Revision for the exam</b></p>   | <p>No third lecture</p>        | <p>No practical</p>   |  |



## 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 and is more for the first half of semester.

## Policies and Procedures

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

Assessment Policy [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html)

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy (in effect until Dec 4th, 2017): [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html)

Special Consideration Policy (in effect from Dec 4th, 2017): <https://staff.mq.edu.au/work/strategy-planning-and-governance/university-policies-and-procedures/policies/special-consideration>

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/>

## 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 Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

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

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### 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

## 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 to integrate new systems and processes of an organisation
- Competence in IT strategic planning.

### Assessment tasks

- Assignment 1
- Group Project Brief
- Assignment 3
- Exam

### Learning and teaching activities

- Covers tutorial material every week

## 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 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).

## **Assessment task**

- Group Project Brief

## **Learning and teaching activity**

- Covers lecture material every week

## **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
- 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 and is more for the first half of semester.

## 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 to 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 and is more for the first half of semester.

## 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 and is more for the first half of semester.

## **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
- 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

## Changes from Previous Offering

Peter will volunteer to lecture in weeks 1-5, Charanya will do week 6-7, Jian will do week 8-13.

## 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:

---

| #  | L.O. |
|----|------|
| #1 |      |

---

|                             |  |   |  |   |
|-----------------------------|--|---|--|---|
| Criteria for <u>L.O. #2</u> |  |   |  |   |
| 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 <u>L.O. #3</u> |  |   |  |   |



|   |  |  |  |   |
|---|--|--|--|---|
| using modelling software  | limited use of BP Modeller showing some understanding of the tool  | competent use of BP Modeller showing understanding of the software and ability to use it effectively, perhaps making some basic mistakes               | good understanding of the software, modelling workflows proficiently and using tool appropriately without any significant mistakes                               | excellent understanding of the software, modelling workflows proficiently and using tool appropriately at an expert level   |
| workflow modelling to improve workflow efficiency               | limited understanding of workflow modelling, some obvious mistakes   | competent understanding of workflow modelling, some trivial mistakes still in evidence, but generally an understanding of what is taking place and why | some incorporation of the literature beyond just competent understanding of workflow modelling   | an excellent grasp of workflow modelling, also drawing on the literature widely to exemplify in the case of further examples how workflow modelling has aided other organisations as well |
| Criteria for <u>L.O. #4</u>                                     |  |  |  |   |
| understanding how use of code such as XML will enable ecommerce | limited understanding of what XML actually is and does, however showing some understanding of how XML enables ecommerce          | competent understanding of XML, limited recourse to the literature, perhaps just relying on the textbook or lecture notes                              | good understanding of the role of XML, with some recourse to examples in the literature, beyond just knowledge of XML from the lecture notes                     | outstanding understanding of the role XML plays, with comprehensive recourse to the literature providing further examples beyond what was asked for in the assignment                     |
| competence in XML   | basic competence in coding, shows obvious and basic mistakes in coding   | proficient but perhaps inefficient coding in XML, still displaying some mistakes, parameters names obtuse and commenting limited                       | proficient coding in XML, perhaps a few trivial mistakes still in evidence, but generally codes quite competently  | outstanding coding in XML, with code efficiencies clearly displayed, all parameters using meaningful names, code well commented   |
| Criteria for <u>L.O. #5</u>                                     |  |  |  |   |
| understanding how WSDL and BPEL enable ecommerce                | limited understanding of what WSDL and BPEL actually is and do, however showing some understanding of how they enables ecommerce | competent understanding of WSDL and BPEL, limited recourse to the literature, perhaps just relying on the textbook or lecture notes                    | good understanding of the role of WSDL and BPEL, with some recourse to examples in the literature, beyond just knowledge of WSDL and BPEL from the lecture notes | outstanding understanding of the role WSDL and BPEL play, with comprehensive recourse to the literature providing further examples beyond what was asked for in the assignment            |
| competence in WSDL and BPEL                                     | basic competence in coding, shows obvious and basic mistakes in coding   | proficient but perhaps inefficient coding in WSDL and BPEL, still displaying some mistakes, parameters names obtuse and commenting limited             | proficient coding in WSDL and BPEL, perhaps a few trivial mistakes still in evidence, but generally codes quite competently                                      | outstanding coding in WSDL and BPEL, with code efficiencies clearly displayed, all parameters using meaningful names, code well commented   |

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.

The final examination in this unit is a hurdle requirement. You must get a mark of at least 40% in the examination to pass the unit. If you get a mark of at least 30% in your first attempt at the final examination you will be given a second and final attempt.

The final mark for the unit will be calculated by combining the marks for all assessment tasks according to the percentage weightings shown in the assessment summary.