



# ISYS358

## Business Information Systems Project

S1 Evening 2015

*Dept of Computing*

### Contents

---

<u>General Information</u>	2
<u>Learning Outcomes</u>	3
<u>Assessment Tasks</u>	3
<u>Delivery and Resources</u>	6
<u>Unit Schedule</u>	7
<u>Learning and Teaching Activities</u>	7
<u>Policies and Procedures</u>	8
<u>Graduate Capabilities</u>	10
<u>Grading and Passing</u>	17

---

#### **Disclaimer**

Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.

## General Information

### Unit convenor and teaching staff

Unit Convenor

Stephen Smith

[stephen.smith@mq.edu.au](mailto:stephen.smith@mq.edu.au)

Contact via [stephen.smith@mq.edu.au](mailto:stephen.smith@mq.edu.au)

30 minutes prior to lectures

co-Lecturer

Deborah Richards

[deborah.richards@mq.edu.au](mailto:deborah.richards@mq.edu.au)

Contact via [deborah.richards@mq.edu.au](mailto:deborah.richards@mq.edu.au)

E6A 328

email for an appointment

Lecturer

Yifan Gao

[yifan.gao@mq.edu.au](mailto:yifan.gao@mq.edu.au)

### Credit points

3

### Prerequisites

39cp including (ISYS254(P) or COMP227(P) or ISYS227(P) or COMP255(P))

### Corequisites

9cp from (ACCG355(P) or ACCG358(P) or ISYS301(P) or ISYS302(P) or ISYS360(P) or MPCE360(P))

### Co-badged status

### Unit description

This unit draws together learning in previous units to prepare students for the workplace. Students work in teams to develop a project plan which is used to manage gathering, modelling and specification of requirements, and develop an appropriate design to solve a given problem, potentially delivering a substantial software product. All projects will involve the development of supporting project documentation appropriate to an information systems setting. The project requires an equal focus on process and the product, requiring the use of quality control and assurance methods, tools and techniques.

## 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:

Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering

Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)

Effectively Communicate results of the software development process (in both written and oral form)

Recognise and address ethical issues when they arise based on an understanding of professional ethics

## Assessment Tasks

Name	Weighting	Due
<a href="#">Feasibility Study</a>	8%	Monday 09/03/15 5pm
<a href="#">Project Plan</a>	13%	Monday 23/03/15 5pm
<a href="#">Increment 1</a>	13%	Monday 20/04/15 5pm
<a href="#">Increment 2</a>	13%	Friday 22/05/15 5pm
<a href="#">Presentation/Demonstration</a>	20%	Week 13 or 14
<a href="#">Delivery of Product to Sponsor</a>	8%	Week 13 or 14
<a href="#">Final Examination</a>	25%	TBA

### Feasibility Study

Due: **Monday 09/03/15 5pm**

Weighting: **8%**

Submit in paper form - E6A assignment boxes (level 1)

On successful completion you will be able to:

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering
- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

## Project Plan

Due: **Monday 23/03/15 5pm**

Weighting: **13%**

Project Plan and Software Requirements Specification

Submit in paper form - E6A assignment boxes (level 1)

On successful completion you will be able to:

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering
- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context
- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)

## Increment 1

Due: **Monday 20/04/15 5pm**

Weighting: **13%**

Increment 1: Updated Plan, Requirements, Design, Test Cases, Prototype

Submit in paper form - E6A assignment boxes (level 1)

On successful completion you will be able to:

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering
- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic

context

## Increment 2

Due: **Friday 22/05/15 5pm**

Weighting: **13%**

Increment 2: Updated Plan, Requirements, Design, Test Cases, Prototype

Submit in paper form - E6A assignment boxes (level 1)

On successful completion you will be able to:

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering
- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

## Presentation/Demonstration

Due: **Week 13 or 14**

Weighting: **20%**

Presentation/Demonstration (8 - includes individual component), RTM , User Manual(4) and Final Report(8)

On successful completion you will be able to:

- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)
- Effectively Communicate results of the software development process (in both written and oral form)
- Recognise and address ethical issues when they arise based on an understanding of professional ethics

## Delivery of Product to Sponsor

Due: **Week 13 or 14**

Weighting: **8%**

Delivery of Product to Sponsor (8) Individual mark provided by sponsor

On successful completion you will be able to:

- Effectively Communicate results of the software development process (in both written

and oral form)

- Recognise and address ethical issues when they arise based on an understanding of professional ethics

## Final Examination

Due: **TBA**

Weighting: **25%**

2 hour Final Examination

On successful completion you will be able to:

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering
- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)
- Effectively Communicate results of the software development process (in both written and oral form)
- Recognise and address ethical issues when they arise based on an understanding of professional ethics

## Delivery and Resources

ISYS355/ISYS358/COMP355 projects will be sponsored by clients from industry.

## CLASSES

Please ensure you attend the first lecture session on Thursday 26th February 2015 as you will be allocated into groups in that class. You are expected to attend at least all compulsory class meetings throughout the year to be eligible to sit the exam and pass the unit. In week 2 the Careers Development Office will run a "Working in Teams" workshop. Attendance is compulsory. If you have a valid reason not to attend a class (work is not a valid reason), you must get approval from the convenor before the class. In the event of illness or misadventure, contact the convenor ASAP.

## REQUIRED AND RECOMMENDED TEXTS AND/OR MATERIALS

### Lecture and Project Material

Some resources useful for your project can be found on iLearn under resources

Please read carefully the document at the Project Deliverables Definition link under Project

Description and Deliverables on the unit iLearn website. Follow the instructions provided in that document for the group project work (worth 75% of the course mark).

## UNIT WEBPAGE

### Website

Please login to ilearn <http://ilearn.mq.edu.au/>

## TECHNOLOGIES USED AND REQUIRED

The technology you use will depend on your client's needs. You will have access to the third year computers and the software on them. You will not be able to add any other software to the machines in the labs. However, you may want to use resources that your sponsor and team members have access to. Your technology needs will be determined and defined by you in your project plan.

## Unit Schedule

WEEK	TOPIC
1	Groups allocated, project management introduction - compulsory
2	"Working in Teams" workshop - location E7B T2 (To be confirmed) - compulsory
3	Lectures on project plans, requirements documents, UML, Design and testing
4	No classes/lectures
5	No classes/lectures
6	No classes/lectures
7	Guest Lecture on Agile Methods - compulsory
8	No classes/lectures
9	No classes/lectures
10	No classes/lectures
11	Exam preparation and ethics module
12	No classes/lectures
13	(date to be announced) Group presentation of system- compulsory

## Learning and Teaching Activities

### Week 1 Team Allocation

COMPULSORY - groups allocated, project management introduction

## Week 2 "Working in Teams" workshop

COMPULSORY - location E5A 110 (To be confirmed)

## Week 3 Lectures/Revision

on project plans, requirements documents, UML, Design and testing

## Week 6 Guest Lecture

COMPULSORY - Guest Lecture by Dr Asif Gill (UTS)(confirmed)

## Week 10 Exam preparation

Exam preparation and ethics module (examinable)

## Week 13 or 14

COMPULSORY - Group presentation of system (date to be announced in second half of semester)

## Learning and Teaching Tips

To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## Learning and Teaching Strategies

COMP/ISYS355 is taught through the involvement in a group project. Much of what is learnt is gained through experience and problem solving at the individual and group level. The unit will require the student to apply knowledge and skills gained in previous units and also require the student to acquire new knowledge and skills which will vary for each student and project according to the problem needing to be solved. The content of the unit includes: Self-study of previous learning material and resources found online and at your organisation. Identification of knowledge and skill gaps and how to address these training needs via self-study. Preparation of a detailed project proposal and plan. Undertaking an extended group project. Preparation of intermediate and final project deliverables. Acceptance of project deliverable(s) by customer. Preparation of a final reflective report. A group project presentation.

## 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.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy [http://mq.edu.au/policy/docs/grievance\\_management/policy.html](http://mq.edu.au/policy/docs/grievance_management/policy.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

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).

Special consideration policy of the Department of Computing:

[http://comp.mq.edu.au/undergrad/policies/special\\_consideration\\_policy.htm](http://comp.mq.edu.au/undergrad/policies/special_consideration_policy.htm)

### Plagiarism

Please refer to the Department of Computing [Plagiarism Policy](#) for the definition of plagiarism, advice on avoiding it and the penalties in place if you are found to have submitted plagiarised work.

## 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://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use 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

- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

### Assessment tasks

- Feasibility Study
- Increment 1
- Increment 2

### Learning and teaching activities

- COMPULSORY - groups allocated, project management introduction
- COMPULSORY - location E5A 110 (To be confirmed)
- on project plans, requirements documents, UML, Design and testing
- COMPULSORY - Guest Lecture by Dr Asif Gill (UTS)(confirmed)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate

material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## 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

- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)
- Recognise and address ethical issues when they arise based on an understanding of professional ethics

### Assessment tasks

- Project Plan
- Presentation/Demonstration
- Delivery of Product to Sponsor
- Final Examination

### Learning and teaching activities

- Exam preparation and ethics module (examinable)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## 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 outcome**

- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

## **Assessment task**

- Feasibility Study

## **Learning and teaching activity**

- Exam preparation and ethics module (examinable)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## **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**

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering
- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)

## **Assessment tasks**

- Project Plan
- Increment 1
- Increment 2
- Final Examination

## **Learning and teaching activities**

- on project plans, requirements documents, UML, Design and testing
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## **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 outcome**

- Critically analyse, describe and apply principles and models of software development and how they fit within the larger context of systems engineering

## **Assessment tasks**

- Feasibility Study
- Increment 1
- Increment 2
- Final Examination

## Learning and teaching activities

- on project plans, requirements documents, UML, Design and testing
- Exam preparation and ethics module (examinable)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## 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 outcome

- Understand and perform the stages of the software development life-cycle (requirements analysis, design, construction, testing) and its different process models in an authentic context

## Assessment tasks

- Feasibility Study
- Increment 1
- Increment 2
- Final Examination

## Learning and teaching activities

- on project plans, requirements documents, UML, Design and testing
- Exam preparation and ethics module (examinable)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills

needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## 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 outcomes

- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)
- Effectively Communicate results of the software development process (in both written and oral form)

### Assessment tasks

- Feasibility Study
- Project Plan
- Increment 1
- Increment 2
- Presentation/Demonstration
- Delivery of Product to Sponsor
- Final Examination

### Learning and teaching activities

- COMPULSORY - groups allocated, project management introduction
- COMPULSORY - location E5A 110 (To be confirmed)
- on project plans, requirements documents, UML, Design and testing
- COMPULSORY - Group presentation of system (date to be announced in second half of semester)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills

needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## 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 outcomes

- Understand and make use of the basic principles of project management, teamwork, the roles and responsibilities of the project manager and appreciate the importance of working closely with the project's customer and the delivered system's end-user(s)
- Recognise and address ethical issues when they arise based on an understanding of professional ethics

### Assessment tasks

- Presentation/Demonstration
- Delivery of Product to Sponsor

### Learning and teaching activities

- on project plans, requirements documents, UML, Design and testing
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## 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

- Recognise and address ethical issues when they arise based on an understanding of professional ethics

## Assessment tasks

- Presentation/Demonstration
- Delivery of Product to Sponsor

## Learning and teaching activities

- Exam preparation and ethics module (examinable)
- To be successful you should: Meet with your group regularly, ideally weekly. Make sure you take notes, set agendas and action items and at the start of each meeting check the status of all action items. Attend the compulsory class sessions. Read appropriate material to support the technical and management aspects of your project. Perform the tasks assigned to you. Undertake self-study to acquire missing knowledge and skills needed for your particular project. Continually review and revise your project plan and ensure you are working to meet delivery of milestones by the specified time.

## Grading and Passing

Your final grade will depend on your performance in the project and exam. In particular:

- You must perform satisfactorily in the examination in order to pass this unit.
- You must contribute to all parts of the project (and your team members should agree) in order to pass this unit.
- You must attend all compulsory class sessions or have been given prior approval not to attend or provide medical evidence of why you could not attend.
- At the end of the course, in rare circumstances and at the discretion of the unit convenor, a bonus mark of up to 5% will be awarded to any student who repeatedly demonstrated exceptional performance, dedication and engagement with the unit. This attainment will typically be identified by comments from the client, other team members and/or my observation of the student.

All work submitted should be readable and presented in a business-like and professional format.

Late work will not be accepted. As you are working in a team and also are expected to perform risk management, sickness or other misadventure needs to be planned for and managed.

If a Supplementary Examination is granted as a result of the Special Consideration process the examination will be scheduled after the conclusion of the official examination period. For details of the Special Consideration policy specific to the Department of Computing, see the

Department's [policy](#) page.

## Grade Assessment Standards

---

P	Has participated in group-based projects which delivered satisfactory outputs throughout the semester and has demonstrated this participation in the final examination.
CR	Has participated in group-based projects throughout the semester which delivered quality outputs and demonstrated in the exam a high degree of contribution to those outputs and good grasp of the concepts relating to working in groups, managing projects and the development of software.
D	Has participated in group-based projects throughout the semester which consistently delivered high quality outputs and demonstrated in the exam a high degree of contribution to those outputs and strong grasp of the concepts relating to working in groups, managing projects and the development of software. All the assignment, practical and tutorial tasks (programming and written) completed to a very high standard. Excellent performance in the written examination.
HD	Has participated in group-based projects throughout the semester which consistently delivered high quality outputs and demonstrated in the exam a high degree of contribution to those outputs and strong grasp of the concepts relating to working in groups, managing projects and the development of software. Students achieving this grade are often distinguished by a high level of effort, enthusiasm, competence and often leadership in their project groups as well as by excellent performance in the written examination.