



School of Computer Science and Software Engineering
Faculty of Information Technology

Student Handbook
CSE4002
Software Engineering Studio Project

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1 Introduction

1.1 Welcome

In this subject, you will build real-world software for real-world clients. For most of you, this will be a somewhat of a challenge. The project work of this subject is far less structured and far less predictable than the other subjects you are used to. You may find that you are working long hours ¹on novel tasks. But take heart! When you look back on your time here at Monash, hopefully you will remark that this Software Engineering studio subject was a very worthwhile and practical subject. And, the one that made you apply the various SWEBOK areas and prepared you for a career in the information technology industry as a software engineer.

The rest of this handbook describes the structure of the subject, its deadlines, and all its associated paperwork. Before we go all formal and official, we just want to say that we hope that this subject will be an exhilarating experience for you.

By the way, if you think that there is too much paperwork and reports associated with this subject, then consider:

- What we ask you to do here is *much less* than you would be required to do in most real-world projects.
- All these reports are our safety net for catching out-of-control projects. We want you to have the satisfaction of building useful software for real clients. We need to help you avoid certain pitfalls of software development. We therefore ask you to fill in these reports since that will let us carefully monitor your progress.

Please note that CSE4002 is only available for Monash Bachelor of Software Engineering final year students. The subject coordinators and supervisors for 2004 projects commencing in semester1 2004 are Dr. Sita Ramakrishnan and Prof. Heinz Schmidt.

Sita Ramakrishnan

¹ In Section 7.2.3 **we guess-timate that each student will spend, on average, up to 12 hours per week on this subject from now right through to the end of semester 2.**

2 About This Subject

2.1 Aim

To give final year software engineering students the opportunity to apply the skills which they have learned so far in the course to the development of real world systems. Students will undertake a large project and work in groups on a software project for a client. The client may be internal to Monash or from the industry or research organisation. In general, projects involve all aspects of the system development lifecycle. Groups are responsible for their own project management, with guidance from a supervisor.

2.2 Objectives

On completion of this subject students will have knowledge of :

- all stages in the process of developing a SE project
- the roles and responsibilities of clients, system users and developers in a SE project;

have an understanding of:

- the way in which computer systems are designed, developed and implemented
- the levels of abstraction at which a system can be described
- the role of tools, techniques and methods in the development of a software system
- the processes and components of a quality system

have the skills to:

- plan and manage the full range of activities in an SE project
- work productively in a team and individually
- communicate effectively with clients and system users
- developing and delivering on time a computer system that meets the specified requirements

and have developed attitudes, which allow them to:

- work productively in a team and have an enquiring mind
- adopt a systematic and professional approach to the production of quality computer systems

- recognise the applicability and limitation of using particular approaches to certain problem areas
- appreciate their social, ethical and professional obligations in designing, maintaining or advising on software systems.

In meeting the above objectives, emphasis will be placed on the quality of the product. This entails the use of proper techniques and tools that enhance product quality including appropriate analysis and design tools, quality reviews, appropriate software testing and a high level of user involvement.

The quality of the product is not judged solely on the merits of the software but also is dependent on packaging. This means producing all necessary documentation. The documentation must be well written and professionally presented. Further, it must be produced at the appropriate point in the development of the product. The development of products will be oriented to computer solutions. However manual operations and/or organisational issues must be adequately addressed.

In addition to the products produced by the project the process by which these products are produced is an important aspect of the subject. These processes relate to how/when/why certain actions are undertaken by the group. It is important for the group to observe their process with the aim of improving it. For example, the meeting process (group meetings, supervisor meetings and client meetings etc) - the products of these meetings relate to minutes, action lists and information for further work. The process relates to how you identified and recorded information, how you involved all people present, why you took a certain approach to an interview and whether it was successful. It relates to the group reviewing not just the products but also reviewing the process by which the product is produced.

2.3 Subject Requirements

2.3.1 Prerequisites

Completion of CSE3302 and BUS2176

It is expected that students have completed all of the 2nd & 3rd year level core units (CSE2303, CSE2304, CSE2201, CSE2302, CSE2305, BUS2176, CSE3324, CSE3308, CSE3391/3395, CSE3302, CSE3325, CSE3322, CSE3323) before enrolling in this student. CSE4002 is a capstone project in the final 4th year of BSE.

(We are considering the possibility of allowing students to complete BUS2176 or CSE2203 as part of the core requirements for BSE. TO BE CONFIRMED LATER).

2.3.2 Duration

The project runs for two semesters, **inclusive** of all non-teaching periods. Most students will begin the project in Semester 1 and complete it in Semester 2 as CSE4002A. This is the normal mode of offering. The projects may be available from 2002 as - CSE4002A: S1 and S2, 6CP each CSE4002B: S1 only, 12CP CSE4002C: S2 only, 12CP CSE4002D: S2 and S3, 6CP each. To begin the project in semester 2 or summer semester or as a 12 point option in one semester, you must obtain specific permission FROM Sita Ramakrishnan, or Heinz Schmidt. Seminars will be held in first Semester during teaching weeks. It should be stressed that these are seminars and not lectures and hence groups and individuals are expected to actively participate by contributing experiences and asking questions. Group Presentations and Walkthroughs will take place during the scheduled seminar time in both semesters.

2.3.3 MUSE Portal

More details will be given in class.

3 Subject Structure

3.1 Assessment Grades

The final result for the project is published as a Grade only, with no mark attached. So you can get HD, D, C, P, NP (Conceded Pass) or N (fail).

Students will receive an "N" for this subject if they fail to satisfy the following requirements:

- Attendance at group, client, supervisor meetings, presentations
- Preparation of a relevant entry for the WWW.
- Handover of project deliverables as agreed with the client.
- Submission of a Project sign off document, signed by the Client
- Production of a client software system with Acceptance testing signed off by the Client.
- Revision of software as per reasonable client request (see Section 3.2).
- Demonstrable participation and input to project work and activities.

See Section 6 for details on how to get a Pass grade and higher.

The usual case is that all students in a group will get the same mark in Group assessment tasks. However, it is possible for a coordinator and/or supervisor (see Section 5) to vary marks for individual students. For 'Personal' assessment (see Sections 6.2, 6.3), the supervisor and the subject leader will award marks to individual students according to merit.

The progress and work done by each group and individual student is closely monitored by the supervisor through weekly meetings, and by the coordinators through progress summaries, presentation, walk through etc. If a student or a group is performing below the standard set as per the various requirements, they will be advised of the need to improve their performance. If the student or group does not improve their work based on the advice given by the coordinators/supervisors, then that student will be withdrawn from the unit and the subject result will be recorded as Fail (N). This can occur at any time during the project year.

3.2 Revisions to Software

Students are expected to deliver their software and final documentation (see Section 6.1.5) to their users by the beginning of October. After delivery, users may request changes. After consultation with the supervisor, some of those changes will be termed "reasonable changes" which students must complete before the start of semester two exams.

Semester	Week	Area	See Sections
----------	------	------	--------------

1	1	groups, members and project choice finalised	
	2	groups contact their supervisor	
	3	progress summary – fortnightly	6.1.3
	5	legal documents signed and delivered	6.1.4
	5	Business case, technical requirements & progress summary documents delivered	6.1.1, 6.1.3
	9	functional specifications signed off	6.1.1
	9	group peer assessment	6.2
	9,10	presentation of user requirements	6.6
	11,12,13	walkthrough #1	5.2, 6.1
	13	incremental release demonstration to client	
2	1	Vers.1 of system - demo to client	6.2
	4	group peer assessment	
	4	client begins acceptance testing of system	5.2, 6.1
	5,6,7	walkthrough#2	
	9	client sign-off for acceptance of system	6.6
	11,12	presentation of system	6.5
	12,13	product assessment by supervisor	6.3
	12,13	individual interview	
	13	Project CD	3.4

Figure 1: Schedule of Milestones

3.3 Schedule

Students in this subject must:

- Build a piece of executable software;
- Attend regular meetings with their group, client and supervisor;
- Assess other members of their group, and be interviewed/assessed by their supervisor.
- Present their project work twice to the SE Studio Supervisors and other groups
- Participate in two Project Walkthroughs, led by the Subject leader.

Students are also required to attend a set of seminars on topics specifically chosen to be of guidance in the course of their project.(see Section 3.5).

The subject schedule is shown in Figure 1. Note that the project should be completed and handed over to the client **before the end-of-semester examinations.**

3.4 Web Page Entry

In order to advertise their work to as wide an audience as possible, each group will prepare a Web Page Entry describing their project. The entries will be linked to the Computer Science and Software Engineering Home Page and can include contact details of group members. Future clients, employers and current students can thus see at first hand what project groups are capable of developing.

3.5 Seminars and Lab sessions

Weekly Project seminars and lab sessions are scheduled - see BSE timetable for venue/time
See Figure 2 for the seminar topics.

3.6 Insurance

The University's Insurance does not cover personal accidents for students engaged in "practical placement". Project work undertaken in CSE4002 would fall within the term "practical placement". The Student Union does, however, carry such insurance cover, and students need not arrange separate cover for the SE Studio Project. Information on the insurance policy is available from the union reception.

4 The Subject Coordinators

The subject coordinators have a background watching brief on all the groups. They will also run the seminars, walkthroughs and presentations. The subject coordinators and supervisors for 2004 projects commencing in semester1 2004 are Dr. Sita Ramakrishnan and Prof. Heinz Schmidt.

Semester	Week	Topic	Room
1	1	Subject introduction, formation of groups and Choosing of projects, Assessment Details	Check BSE timetable
	2	Project management; Conducting meetings, Group Dynamics, Conflict resolution	
	3	Documents, Standards, Quality Assurance, Professional ethics	
	4	Methods and Tools	
	5 6,7,8	Testing, Installation, User Acceptance NO SEMINAR	
	9,10 11,12,13	Group Presentations #1. Schedule TBA Walkthrough #1. Schedule TBA	
2	1	Overview of semester 2, submission details, students to report on progress	
	2,3	No seminars, students to work on their project In the lab, supervisor may review work	
	4	Group peer mark/SWEBOK assessment	
	5,6,7-10	Walkthrough #2. Schedule TBA	
	11,12	Group Presentations #2. Schedule TBA	

Figure 2: Seminar/Presentation series

5 The Supervisor

5.1 Role of the Supervisor

Each group will be assigned a supervisor for the whole year. The role of the supervisor is *NOT* to act as analyst or designer of the project. That is the responsibility of the group. The role of the supervisor is to:

- Advise and assist the work flow of the group.
- Review the work produced by the group and suggest changes/improvements as necessary.
- Detect significant deviations from the project scope and time estimates.
- Provide an official high-level liaison point between the client and Monash University.
- Award marks to the group and to group members (see Section 5.2).
- Ensure that the groups are aware of how deviations from the subject requirements described in this document can affect their marks.
- If appropriate, the supervisor may:
 - Attempt to manage conflict resolution between group members and the client.
 - Make suggestions about down-sizing the initial project scope.
 - Assist with complex negotiations with the client. However, for the most part, client liaison is the group's responsibility.

5.2 Marks Awarded by the Supervisor

At the end of semester 2, the supervisor awards up to 10 marks to each group member based on an interview which establishes what they have learned from the subject. In addition, up to 5 marks is awarded to each group member based on their contribution to the project. The structure of these interviews is discussed in Section 6.5.

In semesters 1 and 2 the supervisor, together with the subject coordinators and supervisors from other projects, will conduct a walkthrough of the group's work, and award up to 10 marks to the group, and up to 5 marks for each group member. This forms the progress monitoring mark and reflects the quality of the development work, the extent to which the project schedule is on track, and how complete/accurate the project paperwork is to date i.e.

- Each fortnight, a set of progress summary documents (defined in Section 6.1.3) must be prepared and placed in the pigeon holes of your supervisor and the IE project coordinator.
- The design documents (see Sections 6.1.1 & 6.1.2) have been maintained diligently.
- The legal and final documents (see Sections 6.1.4 & 6.1.5) have been delivered at the appropriate times.

At the end of the project, the supervisor awards up to 20 marks at a live demonstration of the software. The client may also be involved in this demonstration, and up to 5 of the 20 marks will be determined by the client's view of the project. In addition, the supervisor and subject coordinators award up to 5 marks as the Project Management mark (see Section 6.3-6.4).

Panels of supervisors will award a combined total of up to 20 marks for the presentations in semester 1 and semester 2.

Assessment Item	Group Mark	Personal Mark	See Section
Presentation #1	5		6.6 - sem1/week12
Walkthrough #1	10	5	5.2,6.1-s1/ week10
Group Peer Assessment #1		2.5	6.2 - s1/week10
Presentation #2	15		6.6
Walkthrough #2	10	5	5.2, 6.1
Group Peer Assessment #2		2.5	6.2
Product Assessment	20		6.5
Project Management Mark	5		6.4
Interview		5	6.3
SWEBOK areas assessed in the studio Lab		15	6.7 - partly incl. In wk10,walkthru#1
Total	65	35	

Figure 3: Marking

5.3 Agenda at Supervisor Meetings

Groups will meet their supervisor on a schedule agreed on by themselves and the supervisor (usually every week). Each such meeting will have at least the following agenda:

- Record which students attended the meeting as well as any apologies for non-attendance;
- Review the action list from last meeting, with particular attention to the tasks that were allocated to each group member.
- Discuss the progress of the project. This will include:
 - A general discussion of the current state of the project;
 - Reviewing any changes to the scope as agreed with the client;
 - Reviewing any documents that are currently due

- Prepare an action list of tasks that should be attempted for the next meeting. These tasks will be assigned to various people, and reviewed at the next meeting.
- Decide a time for the next meeting (planned at this stage for the same time every week)

6 Assessment

Students will normally work in groups of five or seven. A student will receive up to 65 marks (of 100) from assessment of the group's work (see Figure 3).

The remaining 35 “individual” marks will be assessed from the walkthroughs held in Semester 1 and Semester 2 (5 marks + 5 marks), the group peer assessments (5 marks + 5 marks), an interview (5 marks), and supervisor assessment of each student's contribution to the project (5 marks).

To obtain a Pass in this subject, it is required that:

- Students satisfy all the hurdle requirements (see Section 3.1) **AND...**
- Students have an overall mark of 50 or more, **AND...**
- Students have earned **at least 50%** of the possible “individual” marks; i.e. at least 17.5/35 **AND...**
- Students have earned **at least 50%** of the possible “group” marks; i.e. at least 32.5/65.

The individual and group marks are shown in Figure 3.

Under special circumstances, the subject leader may recommend a grade of “NP” if a student’s marks fall just below a Pass. Otherwise, a “N” (fail) mark will be awarded.

6.1 The Progress Monitoring Mark - Walkthroughs #1 and #2

Walkthroughs in Semester 1 and Semester 2 are used to monitor and assess the progress of the project. The subject leader, together with other supervisors review each group and assess the individual contribution of each group member, the extent to which the project schedule is on track, the quality of the development work and how well the group has prepared and maintained the project-related documents. In 2004, Sita Ramakrishnan and Heinz Schmidt will perform this role. The project documents are divided into:

- The *documents* (see Section 6.1.1) which will probably only need to be written once; (week 9 to supervisor/client)
- The *documents* (see Section 6.1.2) which will probably need to be revised regularly; (vers.1 - week 9-10 - design)
- The *progress summary documents* (see Section 6.1.3) which will be revised fortnightly.
- The *legal documents* (see Section 6.1.4) - (all in by week 9/10).

- The *final documents* (see Section 6.1.5).
- And any other documentation as negotiated with by the user.

6.1.1 Milestone Documents

When:	Version 1 (Docs 1,2,3,4) due by week 5, Semester 1 Version 1 (Doc 3&6) due by week 9, Semester 1
Copies to:	Supervisor, client, subject coordinator (final version)
Revised:	As required. It is anticipated that these documents will not be revised very often.

These documents comprise:

- (1) A short description of the business case for the system. The business case is like the executive overview of the system for the board of directors.
- (2) Statement of technical requirements of the project; e.g. hardware, software, memory requirements.
- (3) Functional Specifications document. This identifies project scope, deadlines and deliverables, and includes analysis and design documents such as database design, data dictionary, data-flow diagrams, entity-relationship diagrams, UML diagrams, preliminary screen designs and a quality plan. The documents may vary depending on the type of the project and the development approach. **THIS IS A KEY DOCUMENT IN YOUR PROJECT.** Effectively, it becomes the 'contract' between the project group and the client, specifying clearly and comprehensively exactly **WHAT** will be developed, **WHEN** deliverables will be available, **WHO** is involved, **HOW** the software will be designed, built, tested and installed, and documenting any special conditions/restrictions/requirements. The Functional Specifications should identify the minimum requirements of the system as well as features that may be included if circumstances permit.
- (4) A Quality Plan and Standards document should also be provided as part of the Functional Specifications. The Quality Plan identifies the particular quality features that the group intends to incorporate into their project, then defines the people responsible and the processes that will be followed to assure the final quality of the product. The Standards document defines all the standards that the group will follow including document formats, coding and design standards, and any particular standards specified by the client.
- (5) Each group is required to provide a Function Point count of their proposed system, using the counting technique presented in the subject CSE2201 Software Engineering Practice. Both the client and the project group sign-off the Functional Specifications.

NOTE: Completion of the functionality as defined by the scope of the Functional Specifications document is the minimum requirement for a Pass grade. Higher grades will depend of the quality of the final product and the development process followed.

6.1.2 Fast-Moving Documents

When:	Version 1 due by week 9, Semester 1. However, preliminary versions should be developed from week 4.
Copies to:	Supervisor, client
Revised:	As required. It is anticipated that the “fast-moving” documents will be revised often.

The fast-moving documents comprise:

- **Screen, Web Page designs**, if applicable.
- **Low-level System and Implementation Design documents** in some agreed notation.
- **Loans list**: all materials on loan from the user.

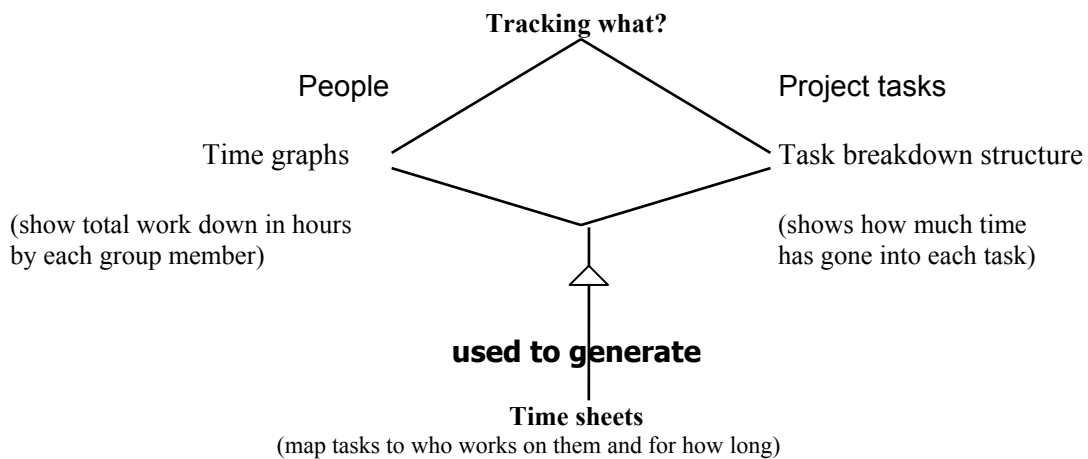


Figure 4: How to track a project

6.1.3 Progress Summary Documents

When:	Version1, Week 4 of Semester 1
Copies to:	Subject coordinator and supervisor.
Revised:	Every fortnight

The progress summary documents comprise:

- **Risk list** (see Section 7.1).
- **Task breakdown structure** (see Section 7.2) showing the tasks and their allocated time.
- **Time graph** (see Section 7.3) showing the cumulative hours spent by each team member. Note that all members of a group must sign the submitted time graphs to certify that they all agree that this graph represents how much work each group member has put into the project.

Maintaining these documents implies that **students must keep individual time sheets**. These timesheets map into the task breakdown structure and the time graph as follows:

- A project can be divided into *what* is done and *who* does it (see Figure 4).
- The task breakdown compares the time estimated and the time taken for the tasks of the project. The task breakdowns can be used to detect if the project is behind schedule.
- The time graphs shows how much time each student has put into the project. The time graphs can be used to detect if certain group members are doing more, or less than their fair share of the work.

The progress summary documents will be used by the subject coordinators to compare the progress of the different groups. It is therefore **very important** for the groups to produce these documents in a standard format. Sample formats used in 2002 & 2003 are shown in Section 7. Note that groups jeopardise their marks for progress monitoring if they deviate significantly from the formats of Section 7. From 2004, we plan to use the MUSE Portal for Task Tracking.

6.1.4 Legal Documents

When:	Week 5 of Semester 1
Copies to:	One original to subject leader. One copy to supervisor.
Revised:	Never
Signed by:	The client signs the Legal Agreement..(see Section 9) After the client signs it, the original is passed back to the subject coordinator, who organises for it to be signed by an authorised official of the University from the solicitors office. The students DO NOT sign the legal agreement. All students are to sign and witness the Deed (see Section 10)

The legal documents comprise:

- An agreement with a schedule
- A deed.

Each team should complete the agreement including the schedule and organise for it to be signed by the client in the presence of the project group. The supervisor is responsible for explaining the need for such a form to the client and arrangement for the signatures. All signed forms should be passed on to the subject coordinator. Where Monash University staff and students develop a system under the SE Studio project program, full ownership and copyright are granted to the client organisation. However, Monash University is granted a perpetual licence to use the system for its educational and research purposes.

It is the policy of the Faculty of Information Technology that staff and students should not be paid for the SE Studio project work. Students are therefore not considered employees of the client organisation. To grant the client organisation ownership of all intellectual property in the system, Monash University requires all students to sign the deed in Section 10 acknowledging that they have no intellectual property rights over the software developed in this subject.

IMPORTANT NOTE: One deed must be signed by EACH student.

6.1.5 Final Documents

When:	On system handover
Copies to:	Client and Supervisor (CD copy as well)
Revised:	Never

The final documents comprise:

- Listings of all source code (if requested), source and object code in a machine readable form.
- Test plans, data and results.
- Complete user documentation for all functions delivered.
- All letters, memos, agreements and any other formal correspondence.
- Project sign off document, signed by the Client

6.1.6 The Project CD

When:	Week 13 of Semester 2
Copies To:	SE Studio Subject Leader

The CD contains **all** the documents, which the group has produced for the project, the source code, an executable version of the system, and the Web Page for the project (See Section 3.4). The CD **MUST** have the following format:

```
/          /* root directory */
System    /* executable files */
Source    /* all source files */
Doc       /* all documentation, including design, test plans, user manual */
Data      /* all data used by the system whether in files of DBMS */
Images    /* all images */
MonashWEB /* web page information for the group on CSSE server*/(TBD)
Reuse module /* contains the source code for the reuseable module*/
ReadMe / Installation Notes / Hardware/Software/ internet service providers/
```

6.2 The Group Peer Mark

When:	Week 9 of Semester 1, Week 4 of Semester 2
-------	--

- Twice during the project, each project team member will anonymously review and assess all members of their own team, themselves included.
- Assessment is based on commitment/involvement in the project, contribution to the work and quality of the tasks performed.

- Peer mark awards up to 5 marks (2.5 marks + 2.5 marks).

6.3 The Personal Interview Mark

When:	Weeks 12,13 of Semester 2
-------	---------------------------

In the final weeks of semester 2 supervisors will conduct an interview with each student. The interview will contribute up to 5 marks to the student's final grade for the subject.

The interview helps the supervisor to establish:

- what the student has learned from doing the subject
- how well the student worked as a member of the project team

Areas to be explored can come from, but are not limited to the following:

- Project Management
- Product Design, Implementation
- Communication with the Client, and the rest of the team
- Product Quality
- Technical skills learned
- Commitment, consistency, quality of project work

The Interview awards up to 5 marks to each student individually.

More Details on Walkthrough #2 in Week 12-13, Sem. 2 2003

Individual Assessment Schedule in the MUSE Studio TBD
(Check your times and be there ON TIME).

Each group needs to hand in their final work on a CD as well as put all the resources of their project on a Server in the MUSE Studio Lab. Each group should have installed the system on the client site. The client should have run acceptance testing and signed off on the project. Each student will be assessed individually. You will be asked specific questions with respect to

- your contribution in the group studio project
- SWEBOK
 - Software Process/Product
 - Method/Tools/Patterns
 - Team work/Environment/Collaboration
 - Conflict Resolution
 - SE Environment/Testing Tools
 - Configuration Management
 - Software Assets (Reuse)
 - Documentation

- Other

Groups 1 - xxx - check your individual time closer to date

Note: Since this final assessment will take place in the MUSE Studio, I urge you to treat the MUSE Studio as an exam venue during that period. If you need to use the machines in the Studio during that time, please do so quietly and please hold any group meetings elsewhere during this period.

6.4 The Project Management Mark

When: Weeks 12, 13 of Semester 2

The supervisor, together with the project coordinators review the way the group have managed the project, taking into consideration such things as:

- group communication, interaction and cooperation
- management of deadlines and timelines
- liaison with the client and supervisor
-

6.5 The Product Mark

When: Weeks 12,13 of Semester 2

Students will demonstrate the working system to their supervisor (and client if available). The demonstration will apply user acceptance criteria to the system. The criteria are based on the agreed functionality of the system as specified in the Functional Specifications document (or an agreed sub-set of same).

- Starting at 10 marks, 1 mark will be deducted for each major bug found and 0.5 marks will be deducted for each minor bug found.
- Supervisors will award another 5 marks for the quality of the system:

5	Exceptional
4	Very Good
3	Satisfactory
2	Improvement required
1	Unsatisfactory

Note that the “quality” mark is subjective. If the supervisor feels that the software would not be useful to the client, then the quality mark may be very low.

- The final 5 marks will come from the client’s opinion of your project.

6.6 The Presentation Mark

--

When: Weeks 9-12 of Semester 1 and Weeks 11, 12 of Semester 2

Students must present their project twice: semester 1, starting week 9-12 and semester 2, starting week 11. The first presentation gives a group a maximum of 5 marks while the second presentation gives a group a maximum of 15 marks. Presentation #1 presents the Business Case and preliminary design. Presentation #2 is close to the end of the project and includes:

- A live demo of the working system or screen dumps if a demo is not possible
- An evaluation of the final system.
- In particular, can it be shown that the project has not failed (i.e. has meet some minimal requirement(s)) and/or has actually succeeded (i.e. has excelled in some demonstrable manner).
- A critical review of the project, including group and client interaction, project management, and final outcome.
- Marks will be awarded by a panel of supervisors attending each presentation.

6.7 SWEBOK Assessment Mark

When: After completion of tasks set in the lab in Semester 1 and Semester 2 Weeks of assessment - TBA (closer to date)

SE Studio lab will be equipped with SE development Environments, method tools, testing tools and configuration management tools. Students will be set tasks to be done during weekly lab sessions to familiarize with industry standard SE tools and processes. Students will be assessed ****individually**** (in week 13) to check their proficiency in these areas.

Assessment of SWEBOK areas awarded up to 15 marks to each student individually.

6.8 Final Assessment, Semester 2 Week 13 in MUSE Studio

Group Assessment

- Assessment of the Software System (Product)
- In-depth Evaluation
- Including a discussion on installation and acceptance testing at client site, project's success rating and problems encountered (would have touched on this in your presentation in week 12 as well)
- Client should have signed off by week 13 -
(Refer to Pages15-18 in the Studio Handbook re: final documentation and project CD)

Individual Assessment

- Personal interview mark, project management mark, product mark and SWEBOK assessment mark (Refer to p. 16-18 in the Handbook for details)

7 Example Documents

7.1 Risk List

7.1.1 About Risk Lists

Risk is everybody's business. Risks should *not* be hidden from the supervisor or the client. The risk list should be updated and distributed to the client, supervisor and coordinator.

The risk list contains up to **ten** problems that the project has or may encounter in priority order (most worrying on top, least worrying on the bottom). A risk may be identified but may not currently be active. Such risks are called *passive* risks. Each risk is augmented by the action taken to minimise the project's exposure to this risk.

If you do not hunt for risks, then risks will come hunting you. The risk list serves to make team members aware that risks can and should be monitored and managed.

7.1.2 Skeleton Risk List

Priority	Active or Passive?	Notes
1-10	P or A	<i>Risk name</i> Action to minimise this risk

7.1.3 Example Risk List

Priority	Active or Passive?	Notes
1	A	<i>Team has never built a Visual Basic/Excel connection before.</i> A working prototype is to be developed ASAP.
2	A	<i>The west coast division may not supply the 1994 historical data by the time we needed it.</i> Organise a tele-conference with the west coast manager immediately to ensure they are aware of our requirements.
3	A	<i>Team unfamiliar with the software being used.</i> Relatively small and relatively unimportant modules have been identified within the current design. Team members are developing their skills in the software by coding these small sections.
4	P	<i>Interface may not be what client wants.</i> Paper mock-ups of interface will be built. Typical business scenarios will be documented. In a session with the client, the proposed interface will be exercised by walking through the scenarios.
5	P	<i>Other subject commitments may hinder development of system.</i> Team leader will collect information of exam and assignment deadlines from all students. Lots of work is planned for the non-teaching weeks.
....

7.2 Task Breakdown Structure

7.2.1 About the Task Breakdown Structure

The task breakdown structure divides the total project into trackable portions. Each line in a table can break down into a sub-table. For example, in Figure 6, see how the 2. *Design* line in the first table expands into a whole table in its own right (see Figure 7).

With each entry, groups must make an initial estimate for how long each task will take (measured in hours). This initial estimate is never changed. However, if the group re-estimates that task, then the new figure is entered into the current column. At the end of the project, students can get a feel for what aspects of their initial estimates were incorrect.

Based on **time sheets that every student will maintain**, the *To date* column can be maintained and reported as a percentage of the current estimate column. This percentage is shown in the *% completed* column.

A review of the *% completed* column can be used to quickly identify a project that is off course. In particular, when the *current* estimate is much larger than the *initial* estimate, and the *% completed* column is very low, then some task is clearly out of control.

Groups may be asking themselves, how can novice software engineers complete such tables? Well, the short answer is that students are not expected to be totally accurate in these estimates. However, only by committing to an initial estimate, then tracking how it changes, can student software engineers refine their estimation skills. Further, towards the middle of semester two, these tables will provide a very clear picture of who is nearly finished and who is in trouble.

Note that these task breakdown tables will most almost certainly change over the period of the project. New tasks will appear and the time required for existing tasks will change. The key thing is *not* to estimate correctly initially, but to react appropriately to the inevitable changes in the project structure.

7.2.2 A Skeleton Task Breakdown Structure

ID	Task Name	Estimates		Actual	
		Initial (hours) A	Current (hours) B	To date (hours) C	% completed D $D=(C*100)/B$
number	string	number	number	number	0-100
	Total				

Figure 5: A Skeleton Task Breakdown Structure

7.2.3 An Example Task Breakdown Structure

Sample task breakdown structures are shown in Figures 6, 7, and 8. Note that Figures 7 & 8 are expansions of the activities associated with the *design* task of Figure 6. The task names and the times allocated in these figures may not be applicable to your project. For example:

- Figure 8 shows task 2.1.1 which divides task 2.1 shown in Figures 7 which, in turn divides up task 2 shown in Figures 6. Note that all tasks do not need to be divided up into three levels.

However, the numbers in these tables can demonstrate several things:

Groups that record their time generally report that they spend between 1000 to 2000 hours on the project. Assuming 4 people in a group and 28 weeks working on the project, which takes about 1350 hours, then each group member averages 12 hours per week on CSE4002. We may have from groups of four or five depending on the SE Studio project size, class size etc. Note that unless this workload is spread out effectively throughout the year, then the SE Studio project can take over a student's life in the second half of semester two. **You have been warned.**

ID	Task Name	Estimates		Actual	
		Initial (hours) A	Current (hours) B	To date (hours) C	% completed D $D=(C*100)/B$
1	Analysis	150	150	150	100
2	Design	200	200	50	25
3	Code	250	250	0	0
4	Test	200	200	0	0
5	Changes	180	180	0	0
6	user-training	100	100	0	0
7	progress documentation	60	60	5	0.1
8	presentation preparation	20	20	0	0
	Total	1160	1160	205	17

Figure 6: Top-level task breakdown structure

ID	Task Name	Estimates		Actual	
		Initial (hours) A	Current (hours) B	To date (hours) C	% completed D $D=(C*100)/B$
2.1	excel/basic interface prototype	40	40	20	50
2.2	Report subsystem	20	20	10	50
2.3	Database design	40	40	10	25
2.4	Screen design	30	30	10	33
2.5	checking screens with users	30	30	0	0
2.6	trialing screens on users	30	30	0	0
2.7	word-processing	10	10	10	50
	Total	200	200	50	25

Figure 7: Task breakdown structure for the design task of Figure 6.

- These sample task breakdown have several commendable features:

-Testing is usually ignored in the task breakdowns of novices. However, note that a large portion of Figure 6 is devoted to *testing*. Further, this group has acknowledged in their plan that testing will inspire changes to the system. Hence the 180 hours allocated to *changes*.

-This group knows that there is lots of work involved in getting a good *progress monitoring* mark (see Section 6.1). Hence, they have allocated two hours a week to the task of updating the progress-monitoring documents (see Sections 6.1.2 & 6.1).

-This group has allocated nearly two days (20 hours) to the preparation of their final public presentation.

Note that task 2.1 *excel/basic interface prototype* is allocated 40 hours. This is a lot of time and should be further sub-divided into another table (e.g. Figure 8). As a rough rule of thumb, divide-up all tasks that are longer than twenty hours².

ID	Task Name	Estimates		Actual	
		Initial (hours) A	Current (hours) B	To date (hours) C	% completed D $D=(C*100)/B$
2.1.1	develop evaluation criteria document	4	4	4	100
2.1.2	do the "advanced excel" tutorial	8	8	8	100
2.1.3	do it (horrible version)	12	12	12	100
2.1.4	do it again, better	12	12	0	0
2.1.5	apply evaluation criteria	4	4	0	0
	Total	40	40	20	50

Figure 8: Task breakdown structure excel/basic interface prototype of Figure 7.

² And, on the other side of the coin, don't bother recording tasks that are very short, say less than 4 hours

Sophisticated spreadsheet programmers could set up all the above as a set of linked tables with the group member's own timesheets down the bottom of the file. This approach would simplify the data entry and the maintenance of the fast-moving documents. However, given the small size of the groups, this may not be necessary. In fact, a simple pencil and paper system might be simpler and faster in the long run.

A standard mistake beginners make with task breakdown tables is that they write one big table like Figure 8 and never see the “big-picture” shown in Figure 6. We encourage groups to identify useful high-level abstract phases of their software life cycle.

7.3 Time Graph

7.3.1 About the Time Graph

The time graph (e.g. Figure 9) shows:

- the cumulative time for each group member during the 30 weeks of the project;
- the cumulative total time worked by the entire group;

The graph should be sized so that the top border is at the current estimate for the entire project. For example, Figure 6 tells us that a project will take 1160 hours. Therefore, Figure 9's y-axis goes up to 1160 hours.

7.3.2 Example Time Graph

Figure 9 shows a sample time graph. That graph shows that the team members are putting different amounts of work into the project:

- The *rock star's* cumulative total is far greater than everyone else on the team. This member of the group is doing most of the work, perhaps because they have certain technical skills that are crucial to the project. Rock stars have to be managed very carefully and diplomatically:
 - The rock star may feel that they are carrying more than their fair share of the project.
 - Their extra experience with the system may mean that they make design decisions that the other team members do not understand.

When faced with a rock star, group communication becomes very important:

- The rock star must ensure that the rest of the team understands what they are doing.
- The rest of the team has to monitor the rock star so that the rock star does not waste time on technical irrelevancies to the project.

The *passenger* has worked far fewer hours than the rest of the group. We call them passengers since the rest of the team is carrying them along. There are at least two causes of “passengers”

-Incorrect project structuring. This group would need to assess its work to see if the “passengers” are somehow being cut-out of the decision making and work practices of the group. In this case, the group should look to methods to include all group members.

-Low motivation or low technical competency of the passengers.

This is a problem that **must** be discussed with the supervisors - passengers will FAIL the subject.

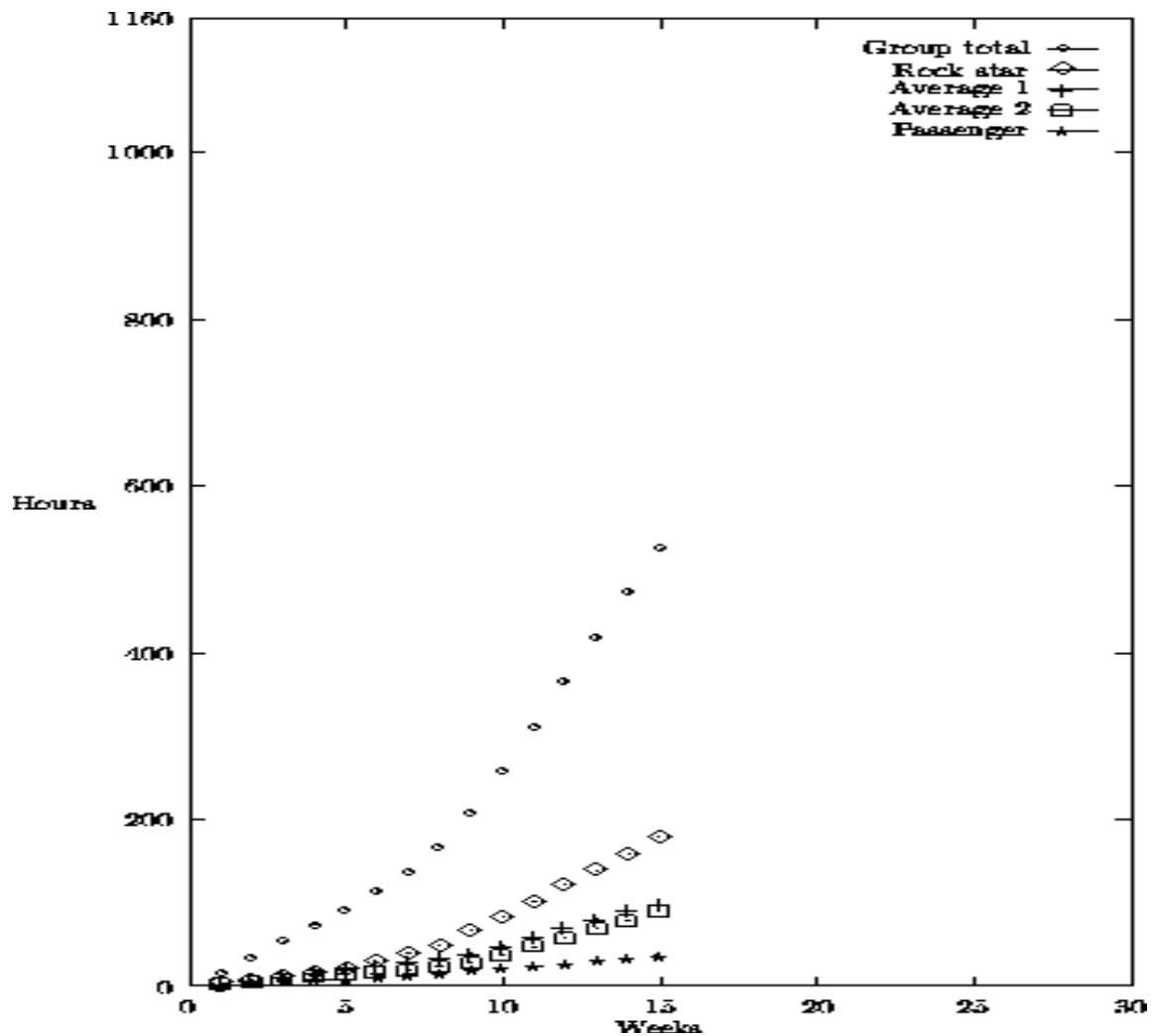


Figure 9 A Sample Time Graph

8 ACKNOWLEDGEMENT

This document has been derived from the IE Student Handbook prepared by the IE Coordinators, Sylvia Tucker and Jason Ceddia at Caulfield Campus, School CSSE. Sita gratefully acknowledges their generous contribution in making the IE handbook available to assist in the preparation of this document.

9 LEGAL DOCUMENTS

DEED OF ASSIGNMENT (External client)

DEED made this day of2004

RECITALS

- The Student is enrolled at Monash University in the Subject:
Software Engineering Studio Project for the degree of
_____.
- The Subject involves development of a system for a client in a simulated consultancy situation.
- Monash University has entered into an agreement with the Client under which intellectual property in the system will be owned by the Client.
- Monash Statute 11.2 – Intellectual Property provides that intellectual property created by a student must be assigned by the University if the intellectual property is prescribed under the Regulations made pursuant to the Statute.
- The following intellectual property is prescribed by the Regulations made pursuant to the Statute:

“intellectual property created by a student which is to be owned in whole or in part by a person other than the student under an agreement made pursuant to section 2.3 of the principle Statute”.

OPERATIVE PROVISIONS

1. Assignment

- 1.1 The Student assigns to Monash University ownership of all rights in any intellectual property arising from the Project including future copyright.

2. Confidentiality

- 2.1 The Student agrees to keep secure and confidential and not to disclose to any third party without the written consent of the Client, any confidential information concerning the Client’s activities, including software, circuit diagrams, hardware specifications, methods, systems, algorithms, and other elements created or developed in the course of the Project including future copyright.

3. Definitions

3.1 **Monash** means Monash University a body corporate established by the Monash University Act 1958, and located at Wellington Road, Clayton.

3.2 **The Client** means

3.3 **Intellectual Property** means any know-how, confidential information, copyright work, circuit layout, eligible layout, design, patent, invention, confidential information, trademark and any related right.

3.4 **The project** means the project for assessment in the subject
.....
being undertaken by the student for the degree of _____
at Monash University.

3.5 **The student** means

3.6 **The subject** means

In Witness whereof these presents have been executed as a **DEED** the day and year first herein written.

Signed Sealed and Delivered by
(the Student) }
..... }

in the presence of:
.....

DEED OF ASSIGNMENT (Internal client)

AGREEMENT made this..... day of2004.

BETWEEN:

Monash University of
Wellington Road, Clayton Vic.3800
("Monash")

AND

_____ of

("the Student")

- The Student is enrolled at Monash University in the Subject "Software Engineering Studio Project" for the degree of _____.
- The Subject involves development of a system for a client in a simulated consultancy situation.
- The Student has agreed to undertake a Project for _____ of Monash University. ("the Client")

OPERATIVE PROVISIONS

1. Assignment

- 1.2 In consideration of contributions made to the Project by _____ the Student assigns to Monash University ownership of all rights in any intellectual property arising from the Project including future copyright throughout the world.

2. Confidentiality

2.1 The Student agrees to keep secure and confidential and not to disclose to any third party without the written consent of the Client, any confidential information concerning the Client’s activities, including software, circuit diagrams, hardware specifications, methods, systems, algorithms, and other elements created or developed in the course of the Project including future copyright.

3. Definitions

3.1 **Monash** means Monash University a body corporate established by the Monash University Act 1958, and located at Wellington Road, Clayton.

3.2 **The Client** means

3.3 **Intellectual Property** means any know-how, confidential information, copyright work, circuit layout, eligible layout, design, patent, invention, confidential information, trademark and any related right.

3.4 **The project** means the project for assessment in the subject
.....
being undertaken by the student for the degree of _____
at Monash University.

3.5 **The student** means

3.6 **The subject** means

In Witness whereof these presents have been executed as a DEED the day and year first herein written.

Signed Sealed and Delivered

Signed Sealed and Delivered by)
Monash University)
in the presence of:) _____

Signed Sealed and Delivered by)
(the student))
_____)
in the presence of:

Legal Agreement (external client)

AGREEMENT dated this _____ day of _____, between **MONASH UNIVERSITY**, of Wellington Road, Clayton, (“the University)

AND _____ (“the client)

of _____

RECITALS

- A. The University wishes to simulate a commercial consultancy situation for third year students enrolled in the University’s degree of _____.
- B. The client has agreed to provide a project team with access to data and systems in order to facilitate development of a system which will form the basis of the students’ assessment in the subject _____.
- C. As the development is a simulation of a commercial situation, the University will not charge for the work done and will not offer any warranty as to the fitness of the system.

OPERATIVE PROVISIONS

1. System Development

- 1.1 A _____ (“the system”) will be developed during _____ for the client by students named in the Schedule to this Agreement.
- 1.2 The development will be completed by the date shown in the Schedule.
- 1.3 The students will be supervised by those persons named in the Schedule.
- 1.4 The system referred to in Clause 1 will form the basis of the students assessment in the subject _____ during _____.
- 1.5 The client warrants that it has the right and authority to grant the students and supervisors access to software used in developing the system.

2. Intellectual Property and Grant of Licence

- 2.1 The client will own all rights in any intellectual property in the system, including copyright.
- 2.2 The client grants the University a royalty free, perpetual licence to use the system for its educational and research purposes.
- 2.3 The licence granted in 2.2 is on condition that use will be confined to an executable version of the system with view-only access to 100% of the source code, but not more than 10% of the source code will be available to students for re-use.

3. Delivery

- 3.1 The University will deliver to the Client a copy of the software and manuals created by the project team for the Client. The Client will pay the University a fair price for the storage medium in which the software and manuals are contained, or the Client will supply the University with substitute storage medium of the same type.

4. Exclusion of Warranty and maintenance

- 4.1 The University makes no warranties, express or implied, and excludes all warranties, representations, terms and conditions, whether express or implied, oral or written, relating in any way to the System or to this Agreement, including any implied warranty of merchantability or fitness for a particular purpose.
- 4.2 The University shall not provide any maintenance or implementation support for the system beyond the completion date specified in the Schedule.

5. Confidentiality

- 5.1 All information concerning the client's business including but without limiting the generality of the foregoing, client lists, software, circuit diagrams, hardware specifications, methods, systems, algorithms, and other elements created or developed by the project team on behalf of or learned from the client is confidential and proprietary information, and the project team will not duplicate, use or disclose any such confidential information to any person unless prior written permission has been given by the client.

6. University's name

- 6.1 The client shall not without the University's prior written consent, use the University's name in any promotional material.

EXECUTION PAGE

Signed for and on behalf of)
Monash University)

by)
in the presence of:)
.....)

)
.....

Witness

Signed for and on behalf of)

.....)
by)

in the presence of:)

.....

Witness

Schedule to Systems Development Agreement

1. Project Title _____

2. Student Members of the Project Team

SURNAME	Given Names	Student No.

3. University Supervisor _____

4. Completion Date _____

10 Student Details



School of Computer Science and Software Engineering

CSE4002 Software Engineering Studio Project

Date _____

Group _____

STUDENT ID: _____

SURNAME: _____ Gender (M/F): _____

Given Names: _____

Local Name (if different from given name): _____

Residence Type: Aust.Citizen Overseas FFP Perm. resident

Previous completed Qualification _____

Term Address: _____

Postcode: _____

Phone: _____ Mobile: _____

Email: _____

Project Preferences: 1 2 3

Any Other Information?

11 RECOMMENDED READING

- Relevant Journal Articles and Conference Proceedings depending on the project chosen.
- Beck K, extreme Programming explained, Addison-Wesley, 2000
- Beck K and Fowler M, Planning Extreme Programming, Addison-Wesley, 2000
- Burke, Project Management, John Wiley & Sons, 2001
- Gilb T and Graham D, Software inspection, Addison-Wesley, 1993
- Humphrey W, Managing the software process, Addison-Wesley
- Humphrey W, Introduction to the Personal Software Process, Addison Wesley 2000
- Kotonya, Requirements Engineering, John Wiley & Sons, 2001
- Pfleeger S.L., Software Engineering Theory and Practice, Prentice Hall 2001
- Pressman R.S., Software Engineering, A Practitioner's approach, Fifth Ed., McGraw Hill, 2001
- Maciaszek, Requirements Analysis and System Design: Developing Information Systems with UML 2001, Prentice-Hall, 2001
- Sallis P, Tate G and MacDonell S, Software Engineering: Practice, Management, Improvement, Addison-Wesley, 1995
- Somerville I.S., Software Engineering Addison Wesley 2001
- Stiller, Project-based Software Engineering, Prentice-Hall, 2001

12 Peer Assessment

Year _____ Semester _____ Group No _____

CONFIDENTIAL: Once this form has been completed, its contents must not be revealed to other students or discussed with other students.

This assessment task asks you to give your considered judgement of the work you and your Project Team members have done so far this year. Since your answers are anonymous, we are relying on you to be both truthful and fair in your assessment.

INSTRUCTIONS

1. In Section A, write down the name of every team member **including yourself**.
2. In Section B, tick the column of your choice for each of the 3 criteria:
 - (i) Provides leadership, useful ideas
 - (ii) Does their share of the work well, and on time
 - (iii) Works well with other group members
3. In Section C you are assessing each member's **overall contribution** to the project. Here you have a total of 10 marks to distribute (12 marks for groups of 6). Divide up the marks between all the members of your team so that the total of the marks you give out comes to 10 (or 12 for groups of 6)
4. Hand your completed form back to your supervisor.

"A" Name	"B" Provides leadership, useful ideas			"B" Does their share of the work well, and on time			"B" Works well with other group members			"C" Overall Contribution
	Low	Av.	High	Low	Av.	High	Low	Av.	High	

13 ASSESSMENT SHEET FOR PRESENTATION 1

Group: _____ Project: _____ Your Name: _____

Please tick ONE of the boxes:

	Excellent	Good	Acceptable	Poor
Overview of the Project, Client, Team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Details of the Project, including 'The Business Case', technical requirements, current problems/proposed system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current state of project, possibly including screen designs, system design in a recognised notation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handling of the presentation, including use of visual aids, planned structure, team involvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Any other comments?

Final mark (out of 5)

Group: _____ Project: _____

Please tick ONE of the boxes:

	Excellent	Good	Acceptable	Poor
Overview of the Project, Client Team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Details of the Project, including "The Business Case, technical requirements current problems/proposed system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Current state of the Project, possible including screen designs, system design in a recognised notation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handling of the presentation, including use of Visual aids, planned structure, team involvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Any other comments?

Final mark (out of 5)

ASSESSMENT SHEET FOR PRESENTATION 2

Group: _____ Project: _____ Your Name: _____

Please tick ONE of the boxes:

	Excellent	Good	Acceptable	Poor
Overview of the Project, Client, Team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Critical review of the studio project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project management, Group & client interactions, SDLC, Lessons learned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demo / Screen Dumps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual aids, planned structure, team involvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other comments?				

Final mark (out of 5)

Group: _____ Project: _____

Please tick ONE of the boxes:

	Excellent	Good	Acceptable	Poor
Overview of the Project, Client, Team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Critical review of the studio project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Project management, Group & client interactions, SDLC, Lessons learned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demo / Screen Dumps	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual aids, planned structure, team involvement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Any other comments?				

Final mark (out of 5)

