This manual should be read in conjunction with the University’s staff and student handbooks or orientation manuals. Detailed unit information can be obtained from members of the Studio Teaching Team, or the University handbook.

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1 Overview of the studio teaching and learning model

In the past, tertiary courses have maintained an emphasis on ‘front-loading’ students with high level knowledge. They have not generally provided meaningful environments or activities in which students can realistically utilise and integrate this knowledge and so practise and develop the interpersonal, management and design/problem solving skills that employers and clients regard as essential. Graduates have found it necessary to acquire these skills in the workplace, and from their experiences therein. However this situation is changing as educators respond to the identified needs of industry (AC Neilson, 1998)

The BIS studio units are designed to provide a broader and more realistic learning experience than straightforward knowledge/skill acquisition (which is nevertheless a critical foundation). Thus in addition to the latter, the studio units have been designed to foster insights and capabilities which reflect the demands of working environments that graduates are likely to encounter.

Studio-based teaching is well established in creative disciplines such as architecture and the arts, but it has been rarely used in the teaching of IT at a tertiary level. The wider use of the studio model for teaching originally proposed by Schon (1983), identified teaching innovations such as problem-based learning, the practicing of skills and techniques, and learning new concepts whilst working in an environment that encourages learning by doing. In a studio environment students work together and seek advise or assistance from mentors. The studio is an environment that attempts to simulate the workplace in which the discipline is situated.

The studio-based approach adopted for use in the BIS program is based on the Bauhaus school of design’s model for teaching and learning. Though the Bauhaus was established in the early 1920s, a number of its educational concepts and underpinning aims together with the industrial style of the Bauhaus design have had a strong influence on the design of the teaching and learning space, the curriculum design, the pedagogy, and the supporting IT infrastructure of the BIS program at Monash University.

2 Educational Objectives

The general aims of the degree are:

a) to educate information professionals to meet the needs of business and society for information systems, services and products in all media.

b) to produce self-reliant professionals able to work in a range of roles, as an employee, team member, contractor or self-employed practitioner.

2.1 Characteristics of the BIS degree

The following characteristics have been identified as appropriate to the BIS:-

a) Development focus: The principal focus of the course should be on the development process, and all subject material should be oriented towards the problems of identifying appropriate areas of application for information management & systems, and developing products, services and systems to meet the different information requirements of users.

b) Vocational focus: The course should be vocationally-oriented in that it should aim to produce graduates who will work in both the public and private sectors developing and managing information services, products and systems.

c) Application focus: The course should not be application-specific, in that no single application area should be specified as a compulsory area of in-depth study. The course should try to provide students with exposure to as broad as possible a variety of applications of information services, products and systems in business and government, while enabling them to develop specialised expertise in areas of greatest interest to them.

d) Practical focus: The course should have a very strong practical focus which emphasises learning by doing; students should be required to carry out the practical development of ‘real’ systems, products and services to reinforce the theory covered in formal lectures and tutorials. The ideas behind the introduction of the learning by doing or studio component of the BIS have been developed over many years, and has been subject to international peer review.1

The course will educate information professionals to meet the social and business needs of the community for information systems, services and products in all media. It aims to produce independent, self-sufficient professionals able to work in a range of roles, as an employee, team member, contractor or self-employed practitioner.
3 Teaching and learning

3.1 Studio teaching team

The teaching team consists of academics and tutors, with the amount of time each spend in the studio unit depends on the year level.

The Studio Manager oversees the progression of studio from one year to the next, and is responsible for the smooth operation of the environment. In consultation with the Studio Leaders develops curriculum, pedagogy, student centred approach to learning, and assessment.

The Studio Leaders, one for each year level, are responsible for the day-to-day operation of the studio units.

Studio Academics, a number for each year level, together with the studio tutors deliver the content of the unit.

Studio Tutors work with the academics to deliver the curriculum. The number of tutors per studio, or if a tutor is allocated to a studio class at all, is at the discretion of the studio teaching team.

3.2 Pedagogy

In constructing the studio experience, it makes sense to integrate, as far as possible, the workplace and the learning rationales, especially as, by their nature, they complement each other. When the rationales are considered together, three foci that can guide learning and teaching, emerge: Collaboration, Integration, and Problem Solving/Design. These foci are explained briefly below.

3.2.1 Collaboration

This has three aspects:

(i) Collaboration between students when they work together in small groups on projects that incorporate problem solving/design, or in developing foundation skills.

(ii) Collaboration between staff and students as staff model effective practise, provide IT assistance, and induct students into the planning and conduct of projects; ie. staff effectively act as mentors and exemplars for students.

(iii) Collaboration amongst staff; academic, administrative and technical to model the practise they wish their students to follow.

3.2.2 Integrated curriculum

Twenty-five percent of the course is devoted to teaching in the studio space, therefore the effective educational use of studio time is critical. As well as introducing new content, the studio unit draws on content, concepts and skills learnt in the other core units, with the integration of these aiming to develop sound and diverse IT capabilities. Constant attention is required to maintain, and in some cases establish, threads between the core subjects.

The studio units aim to provide an integrative function in two ways: Firstly, they offer a teaching/learning framework that integrates and links the knowledge and skills of the other core units in fairly broad project-type activities. Secondly, the studio teaching/learning environment (the studio precinct) encourages a holistic approach to IT through an alliance between the teaching methods and the supportive IT infrastructure.

3.2.3 Problem-based learning

The descriptor ‘problem solving’ can be used diversely, from narrow, strictly defined problems (eg. a maths or software problem), to very open problems (eg ethical issues or system design). A range of ‘problems’ in the studio units are encountered. Responses to these problems may contribute to the students’ portfolio.

3.3 Student engagement

School and university students regularly criticise teaching and learning environments that focus largely on theoretical knowledge in transmissive (‘teacher telling’) class or lecture settings. Within the primary focus of ongoing growth in subject understanding, students consistently identify key aspects of learning environments that can contribute to learning becoming meaningful, interesting and satisfying. Some of the significant key aspects are:

• Control - students having (sharing with the lecturer) a realistic degree of intellectual and practical control over their engagement with the content and processes of learning and assessment, (in contrast to having to respond completely to the dictates of staff or subject structure).

• Relevance - becoming aware of the relevance, outside the educational environment, of subject knowledge/skills, and having an opportunity to use such knowledge/skills for personally relevant purposes,
contrast to uncontextualised ‘theoretical’ learning whose relevance may not be apparent, and for which opportunities in applications are not provided).

- **Integration** (where appropriate) - of knowledge/skills from several subjects, and linking relevant aspects of topics and subjects.

- **Importance** - learning that is perceived as important to individual students, who can understand where it is leading and how it can contribute to their goals and aspirations.

- **Variety and Novelty** - as well as appreciating variety within the daily/weekly learning experiences, students also value new ways of engagement, (in contrast to the steady diet of standard lectures and tutorials).

- **Active Involvement** in the learning, (in contrast to passively 'receiving' knowledge).

- **Interesting and Meaningful Processing Tasks** - associated with knowledge that is 'delivered' transmissively.

- **The Amount and Difficulty** of the work - learning that is interesting and challenging, and yet reasonably within the scope of student experience, expectations, available time and knowledge/skills, (in contrast to being too easy, too difficult, or excessively time consuming).

- **Good Personal Relationships** - both with staff and other students, and a friendly, supportive environment.

### 3.4 Seminar/studio

The studio classes are delivered using a teaching approach that is not traditionally used for the delivery of IT undergraduate courses. A teaching and learning model based around the development of collaborative learning environments replaces the traditional lecture theatre/tutorial room/laboratory environment. Students are learning and practicing the skills and techniques required in the discipline in a working environment which encourages learning by doing, and which progressively over the three year program increasingly simulates the working environments that they will encounter subsequently in their professional careers. It is anticipated that the teaching of a traditional IT degree within the non-traditional studio-based environment will produce graduates that have more than academic knowledge and skills, but also the ‘hidden’ employability skills of communication, cooperation, collaboration, and self-direction that industry is demanding (Carbone, et al, 2000).

A seminar class is more like a forum than a formal lecture. Students are encouraged to participate in discussion and activities conducted during the seminar. During the seminar, guest speakers are invited to address the BIS cohort or a specific year level.

The studio class is where the students have the opportunity and support to practice what they are learning (Schon’s ‘learning by doing’ concept). There is a range of content experts available to the students during the studio class. These are studio academics, tutors and specialists (academics or external people), and consultants.

The number of scheduled hours and the ratio of seminar to studio may differ between year levels, and over a period of time. For example, each week the first year studio unit may have one hour seminar and a three hour studio class, second year may have a seminar every second week and a three hour studio class every week, and the third year studio unit may have a four hour of studio class each week and a seminar as required.

### 4 Assessment

#### 4.1 Portfolios

Portfolios have been defined by numerous researchers, for example Paulson, Paulson & Meyer (1991), who describe portfolios as “a purposeful collection of student work that exhibits the student's efforts, progress, and achievements in one or more areas of the curriculum.”, and “a collaborative, self-reflective collection of student work generated during the process of instruction”.

#### 4.2 Examinations

The examination method may differ at each year level, and each year as it is up to the year level studio teaching team to decide on the most appropriate examination method. An examination is supervised, and could be any of the following:

- a formal written response to specific questions
- an individual oral presentation of individual work
- an group oral presentation of a group project
- an interview.
5 Studio Environment

5.1 Studio precinct

The studio precinct includes a number of spaces; the studios themselves, an Internet café, a meeting room, a ‘quiet area’ and an area for technical support staff.

The main teaching space for the studio subject is the ‘studio’. The studio is also the place where students constantly interact within a group, their peers, and mentors. There are currently two studio spaces. Studio 1 (see Figure 1) was conceived as the space where IT literacy and didactic teaching would occur. It is the foundation space where basic critical skills could be acquired and developed. Students commonly work in groups of three, share ideas between the other group at the same table or with groups in close proximity to them, or less frequently, work individually.

Studio 2 (see Figure 2) was designed as a space for more intense teamwork. The large conference-type table in the centre of the room is used for discussions of up to 25 students, where the smaller ‘D’ shaped tables on the room’s perimeter is used for groups of five students.

The Internet café (see Figure 3) is an informal meeting place and social centre of the BIS studio precinct and its design and location reflect this. The café is also a space that students and staff can go for relief from intensive studio activity. As the studio precinct is accessible twenty-four hours a day, seven days a week, the café is equipment with a kitchenette.

The meeting room (see Figure 4) has been designed as a professional space with high quality furniture and facilities. It is used for consultations, studio group meetings, student meetings, presentations, and ad hoc purposes.

5.2 IT infrastructure

One of the basic ideologies behind the BIS studio-approach is to simulate professional practice. With this in mind, the IT infrastructure has been designed to support the students whether they are within the physical space, or outside it, on or off campus.

The IT infrastructure can be divided into four areas; network, computers, peripherals, and electronic community.

5.2.1 Network

All BIS computers are connected to the Internet, the university student network, and the SIMS network. Connectivity to each of these networks allows students to become familiar with complex computer systems, and enables them to select the most appropriate system for the task at hand. The university student network provides shared server space that can be accessed from anywhere within the university.

There is also a radio frequency (RF) network throughout the studio precinct. There are two Base stations installed in the studio precinct. The network uses radio signals to communicate through solid objects, have a range of approximately 45 metres and run at 11 Mbps. The RF network is accessible throughout the studio precinct and within its perimeter – including the grassed areas adjoining the building. The versatility of this network allows laptops equipped with a radio frequency network card to access a variety of networks without being confined to the ‘classroom’. Tutors, students and staff can have their private laptops configured to use the Studio RF network.

5.2.2 Hardware

The student computer network run under Windows 2000 operating system and the Macintosh computers operate under OS9. There is two configurations for the studio computers ranging from a standard multimedia computer configuration (128 Meg RAM, 17”monitor), and floppy ‘drive-less’ computers. The decision to have one studio without internal floppy drives was to made to encourage students to think and work electronically. There are USB floppy drives available for loan.

To enable the students to explore other computer environments, an Apple iMacDVD is in located in the Internet cafe and numerous Apple iBook notebooks are available for student use. A Windows laptop is also available for use within the studio precinct or off site. All notebooks/laptops have RF network cards installed and configured for use in the Studio RF network.
5.2.3 Software

In addition to the University standard applications, specific software as determined by academic staff and suggestions by students, is installed on the network. Some software is installed on the individual computers’ harddisk, but this is kept to a minimum due to high level of maintenance. A software image of the Studio computers is made every semester, or more regularly if required. This image ensures that any one computer can be re-built in as short a time as possible.

5.2.4 Peripherals

In tune with the overall philosophy of the BIS studio-based teaching and learning environment, equipment has been purchased for students and staff. A loan system administers the movement of the peripherals. Most of the equipment can be borrowed for use on or off campus, though borrowing is limited to overnight unless special arrangements are made. The equipment includes digital cameras, desk-top video conferencing cameras, Windows notebook computers, USB floppy drives, USB/parallel scanner, microphones, headphones, and a variety of copyright free clipart/image CD-roms. A small, high luminance data projector is also available for student in-precinct loan, or staff loan. Each studio contains printers and photocopiers, which can be used on a cost-recovery basis.

6 Studio access

To access the studio environment staff/student card needs to be ‘registered’ with Faculties and Services. This is organised in the first week of semester. Only registered staff and students are allowed to access the studio facilities.

7 General information for students

In undertaking this subject, you are expected to:

- Become familiar with the use of IT to record, store and manage information for business purposes.
- Develop and maintain skills in the use of IT tools for project work that involves the planning and preparation of information system components and information management products.
- Gain fruitful practical experience within a realistic working environment that is oriented to the development of information systems for business purposes.
- Practise and develop interpersonal and communication skills that are important for working with clients and in teams.

Within a business framework, these four aims may be summarised as:

- Foundation and advanced skills in IT and applications.
- Selection and use of such competencies in specific projects.
- Integration of capabilities to fulfil design briefs and solve problems.
- Soft skills for teamwork and client satisfaction.
8 References


8.1 Additional References and Readings

8.1.1 Hardware


8.1.2 Integrated Curriculum


http://vocserve.berkeley.edu/ST2.1/LookingatCurriculum.html [Accessed May 2000]


8.1.3 Problem Based learning


8.1.4 Bauhaus


8.1.5 Studio-based teaching


