



**UNIVERSITY *of* BALLARAT**

**School of Education**

**Proposal for a New Course**

**Bachelor of Education /  
Bachelor of Technology**

**Commencement Date**

**Semester 1  
2002**

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## **Executive Summary of New Course**

**It is proposed that the Bachelor of Education/Bachelor of Technology be introduced in 2002. The course will help address the anticipated shortage of mathematics, science, materials and systems technology and vocational education and training teachers in Victorian schools, as well as providing career pathways in science and technology industries.**

**The course was funded under the Backing Australia's Ability program, a Commonwealth Government initiative to provide new university places for training scientists and technologists.**

**The proposed new course will incorporate:**

- **Education studies**
- **Discipline studies in mathematics, science, materials and systems technology, and vocational education and training programs**
- **Innovation and entrepreneurial studies, and**
- **Industry – workplace experience**

# 1. Course Summary

## 1.1 Title

Bachelor of Education / Bachelor of Technology

## 1.2 School

Education

## 1.3 Course Coordinator

Associate Professor Helen Hayes

## 1.4 Course Development Team

Associate Professor Helen Hayes – Course Coordinator

Mr Gary Allen

Mr Kelvin Jarvis

Professor Julian Lowe

Mr David Manterfield

Ms Joy Nunn

Ms Jackie Tuck

Professor Martin Westbrooke

## 1.5 Admission Requirements

### 1.5.1 School Leavers

- a grade average of at least 25 in Units 3 and 4 of VCE English
- a pass in Units 1 and 2 in any VCE Mathematics
- a satisfactory interview
- at the discretion of the Course Coordinator
- a satisfactory police check is required for confirmation of enrolment

### 1.5.2 Mature Age

- applicants who have not undertaken Year 12 or tertiary study in the previous three years may be required to sit a mathematics and/or English or general aptitude test
- a satisfactory interview
- at the discretion of the Course Coordinator
- a satisfactory police check is required for confirmation of enrolment

### 1.5.3 Trade Qualified

- a Certificate of Proficiency of the Victorian Industrial Training Commission or equivalent and substantial relevant work experience such that the period of apprenticeship and work experience totals not less than eight years, or
- a Certificate of Technology or other approved two year full time post Year 11 TAFE certificate or equivalent, plus at least six years relevant work experience, or
- a diploma or other approved two year full time post Year 12 diploma or equivalent, plus at least two years of relevant work experience, or
- other such vocational qualification and occupational experience as may be deemed by the University and the Department of Education, Employment and Training to be at least equivalent to one of the above.
- a satisfactory interview
- at the discretion of the Course Coordinator
- a satisfactory police check is required for confirmation of enrolment

## 1.6 Advanced Standing

Credit transfer, recognition of prior learning and complementary credit will be given according to the University of Ballarat regulations.

### 1.7 Credit Points

The Bachelor of Education/Bachelor of Technology (BEd/BTech) course will be 540 credit points.

### 1.8 Duration

Four and a half years (normally) or part time equivalent after the first year, following consultation with the Course Coordinator.

### 1.9 Mode of Delivery

Semester (day)

### 1.10 Planned Enrolment

The anticipated EFTSU profile load as per the funding model for 2002 is:

	2002	2003	2004	2005	2006
Year 1	35	35	35	35	35
Year 2		26	26	26	26
Year 3			20	20	20
Year 4				15	15
Year 5 (0.5)					6
<b>TOTAL</b>	35	61	81	96	102

### 1.11 Award Entitlement

Successful completion of the course will entitle a student to the award of Bachelor of Education/Bachelor of Technology, and qualify him/her to seek registration as a teacher in secondary schools.

### 1.12 Relationship with other University of Ballarat Courses

The course includes units from the Schools of Business, Science and Engineering, Information Technology and Mathematical Sciences, Education; and Construction, Manufacturing and Technology.

### 1.13 Articulation and Pathway Arrangements

The Bachelor of Education/Bachelor of Technology has been introduced for students from VCE and direct application, particularly from people working in industry.

In conjunction with the University-wide emphasis for developing coherent pathways through TAFE and Higher Education, the Bachelor of Education/Bachelor of Technology has been developed with the intention of allowing entry points from a wide range of educational and industry backgrounds, as well as allowing students to exit to a range of careers both in education and industry.

The course has the potential for pathways to be developed from TAFE course to Higher Education, and vice versa, and from one Higher Education course (e.g. Education) to another (e.g. Science).

### 1.14 Bachelor of Education/Bachelor of Technology Impact

The proposed Bachelor of Education/Bachelor of Technology is funded under the Commonwealth Government's program "Backing Australia's Ability". This course will have an EFTSU impact on the Commonwealth Department of Education, Science and Training (DEST) funded teaching load of other teaching Schools. The course has been developed in response to growth places allocated by DEST and is an additional load to that funded through the 2002 funding model. In 2002 funding for the course will be

delivered to Schools independent of the funding model and budgets that have already been approved.

The course design allows for up to fifty-five per cent (56 EFTSU) of the total course load to be taught by a teaching school other than Education. Fifty per cent of the first year load (17.5 EFTSU) can be taught outside the School of Education so there could be staffing issues to be resolved if all students choose to study a particular major.

The Education units and teaching experience units will require additional staffing of up to four 2-hour tutorials per week, or liaison with and visits to schools during teaching experience. The staffing required by the course can be estimated to be about 40% of a full-time staff member. In 2002, the School of Education can accommodate this within established staff levels.

The School of Science and Engineering units are existing units and it is anticipated that current staffing will cope with the increased load, whilst four out of the five Business units are new subjects. The School of Business estimates an EFTSU of 21 by the end of Year 3. The extra EFTSU will be required to finance a new appointment in innovation to complement their existing staff resources. In addition to this the School of Business will invest \$2,000 per unit (total of \$10,000) for course material development. In light of these comments it is requested that the School of Business receive a special establishment grant to provide initial resource requirements.

In order to deliver this course extra tutorial space is required. It is envisaged that some students will be able to participate in existing classes (such as Science and Engineering units), whilst additional space may be required for units offered by other schools, specifically Education and Business units.

It is expected that the allocated number of 35 new students will be enrolled in the course for the first year, with a follow on in subsequent years. This would impact on Library Services, but it has been indicated that the resource implications can be met. It has, however, been suggested by the Information Services Branch that a significant upgrade of 24 hour access computer laboratories be considered as the demand for these laboratories is increasing. After hours technical support and supervision should also be reviewed as a University-wide concern.

## 2. Context of and Rationale for the New Course

### 2.1 Background And Rationale For The New Course

Australian industry, to be competitive in the world economy and responsive to our domestic market demands, must implement innovative responses to business opportunities; while business, in turn, is reliant upon having a motivated and skilled workforce, capable in mathematics, science and technology. At the same time, Australian schools are rapidly losing their expert and innovative teachers in these areas, largely through retirements – these teachers are among the oldest in the workforce – with rural and regional Victorian schools currently experiencing such shortages even more acutely.

Industries wishing to decentralise, who see regional Victoria as an attractive place to establish or expand business opportunities, are partly influenced by the availability of a skilled workforce; we would be sending them the wrong message if we are unable to staff our schools in science, mathematics and the range of technology areas.

The School of Education responded to the anticipated shortage of teaching expertise in science and technology and related areas including mathematics and vocational education and training (VET), particularly in rural and regional Australia, by developing this degree in partnership with industry, government and the regional secondary school communities.

The new degree has strong themes in entrepreneurship and innovation. These two themes underpin the multi-sectoral and multi-disciplinary nature of the course. Students will take an entrepreneurial view of business venture creation and technological change, which in turn will better equip them to make student learning more relevant and their teaching approaches more responsive to innovation and change. This initiative is in line with the University of Ballarat's strategy to foster links with regional communities and to assist regional and national industries to implement innovative modern practices. The University is well placed to bring together the innovative, multi-sectoral team necessary for new approaches to science, mathematics and technology education and teacher training.

There are extensive changes occurring in the area of schooling generally, with a number of key reports (e.g. 'The Adelaide Declaration'; *Public Education: the Next Generation* – The report of the Ministerial Working Party, and Kirby: *Ministerial Review of Post Compulsory Education and Training Pathways in Victoria*.) documenting changing community expectations of schooling, as well as changes occurring within schools to respond to these challenges. Currently, much research centres on the need to improve student engagement in the middle years of schooling and senior retention rates. Central to both of these issues is the quality of teaching in our schools. The University is responding by taking a new approach to teacher training, providing graduates with business experience and extensive teaching experience linked to innovation and change.

The current state government is actively encouraging the growth of partnerships in the broader community and in learning centres in particular. The new degree will foster such partnerships in the development and refinement of the course and through its extensive practicum elements. The students will spend close to three semesters in industry and schools, undertaking teaching and technological training; being mentored by professionals and exposed to innovative business initiatives. Through the multidisciplinary team project they will actively contribute to the linking of ideas and action around the planned implementation of a new technology-based venture or process in local industries. The team enterprise project aims to link the school, university, business and the community around a change-centred issue. This will also

enable schools to expand upon the links with industry begun with VET and work experience programs.

The course structure will allow entry for VCE students through the normal VTAC process (after 2002), and for trade qualified applicants who will be given recognition for prior learning. The latter group may complete the degree in three years. All students will complete two semester blocks of teaching experience with an additional unit of industrial experience for VCE entry students.

The course development team has consulted with various stakeholders; including staff, school principals, industry representatives, union officials and the Department of Education, Employment and Training personnel. This was undertaken to gauge support for the nature of the course, to have industries and schools willing to accept students for their industrial and school experience, to allow input from the employers of the graduates and to seek union support for some unique elements of the teaching practicum.

In particular, the course will:

- a. Better prepare teachers for the changing nature of schooling by developing enterprising teachers able to engage young people with their learning.
- b. Establish a new pathway, in the region, for qualified tradespeople into higher education.
- c. Strengthen learning communities by building enterprise and multidisciplinary teams.
- d. Strengthen existing partnerships between TAFE, higher education and industry-based learning.
- e. Enhance the standing of the University in the community.
- f. Expand the employment options for our education graduates.
- g. Provide entry for non-traditional higher education students.
- h. Provide a channel for school-based personnel to have an input into teacher education.

As part of its charter the University of Ballarat looks for ways of enhancing its connections with local and regional industries, schools and communities. Students will be assisting industry with the implementation of new technologies in either a product or a process context. The graduates will enter our schools with contemporary education training and experiences in business and industry innovation and entrepreneurship.

## **2.2 Course Objectives**

The Bachelor of Education/Bachelor of Technology is a course aimed at developing professional educators for mathematics, science, technology and vocational education and training in a number of settings: regional and rural schools, TAFE colleges and private enterprise. The course provides a strong balance of *professional studies in education, curriculum studies, practicum studies* and introduces into an education degree studies in *innovation and entrepreneurship*. It incorporates academic studies with industrial experience and learning based projects with an aim to enhancing links between the University, school community and business settings.

## **2.3 Graduate Characteristics**

The graduate characteristics associated with the Bachelor of Education/Bachelor of Technology should be viewed in conjunction with the generic University of Ballarat characteristics. It is anticipated that graduates will demonstrate qualities which reflect “self reliance, communication skills, information technology literacy, critical awareness and problem solving, cultural sensitivity, scholarship, global perspective, capacity for enterprise development, information literacy, personal confidence, practical application of theory and the ability to work in teams” (Candy,1998, *Strategic Planning Framework*).

It is anticipated that graduates will have approximately equal opportunities for employment in science and technology industries; and mathematics, science, technology and vocational education and training teaching positions.

### **2.3.1 Personal Attributes**

- 2.3.1.1 Be a lifelong learner and view learning as a process involving partnership, dialogue and participation;
- 2.3.1.2 Understand issues associated with making sustained contributions to learning communities;
- 2.3.1.3 Be resolved to engage in professional learning throughout his or her career, to embrace change thoughtfully, and to keep up to date with relevant theory and changing educational practice;
- 2.3.1.4 Be committed to personal learning that is demonstrated through an openness to ideas, have a reflective, analytical, flexible approach to their practice and be future orientated as continuing learners;
- 2.3.1.5 Have well developed communication and information literacy skills which are demonstrated in an ability to access and conceptualise information, develop a coherent theoretical understanding, and to communicate with diverse audiences utilising a variety of communication modes;
- 2.3.1.6 Have a global perspective that is reflected in an understanding of, and respect for, the economic, social, and biological interdependence of global life as it is experienced in schools, and other educational environments.

### **2.3.2 Professional Skills and Capabilities**

- 2.3.2.1 Be capable of making sustained contributions to learning communities;
- 2.3.2.2 Have a sense of him/herself as a teacher-learner and a teacher-researcher;
- 2.3.2.3 Facilitate learning by developing and maintaining classroom and educational environments which promote self expression, respect, collaborative teamwork and effective communication;
- 2.3.2.4 Understand the learning needs of individuals and groups of students and provide enriching, stimulating and motivating learning environments to cater for diverse needs;
- 2.3.2.5 Be skilled to competently, confidently and creatively monitor, assess, evaluate and maintain accurate records of progress, and to communicate effectively with students, staff, parents and others;
- 2.3.2.6 Have a well-developed understanding of the curriculum requirements of schools, be forward thinking in curriculum development and successfully integrate curriculum within the learning environment.

### **2.3.3 Educational Trends and Issues**

- 2.3.3.1 Understand the ways in which the role of the teacher has changed and continues to change;
- 2.3.3.2 Be conversant with ongoing research and theorising about professional frameworks such as ways of knowing and the nature of learning;
- 2.3.3.3 Be an observant and responsive adult in relation to the experience of change in students’ lives, eg entering school, moving to another school;

- 2.3.3.4 Be ready to judiciously embrace innovative and entrepreneurial practices in schools and other educational environments;
- 2.3.3.5 Be knowledgeable about their professional responsibilities and of the agencies and individuals who can offer them help and support;
- 2.3.3.6 Be thoughtful, skilled, imaginative, enthusiastic and responsive in order to foster an effective learning environment;
- 2.3.3.7 Be committed to students' learning that is demonstrated through an openness to ideas, have a reflective, analytical, flexible approach to their practice and be future orientated as continuing learners.

#### **2.3.4 Understanding Social and Cultural Issues**

- 2.3.4.1 Be culturally sensitive and have an appreciation of the value of cultural and disciplinary diversity and tradition, manifested through a commitment to action, interpersonal respect and social responsibility;
- 2.3.4.2 Understand and appreciate the broader contexts of education and other professional environments and be aware of the complex issues associated with communities, schools, families and individuals;
- 2.3.4.3 Understand and respond sensitively to the emergent trends in the use and incorporation into personal, social, ethical and professional environments of learning technologies.

### **3. Structure of the Bachelor of Education/ Bachelor of Technology: Strands and Themes**

#### **3.1 General**

The structure of this course reflects the complex set of professional and personal skills, knowledge, attitudes and values associated with mathematics, science, materials and systems technology, and vocational education and training, needed for graduates to work in contemporary learning environments, particularly those involving Year 5-12 groups in schools; and for graduates to be employed in science and technology industries.

The course has a strong focus upon integrating the traditional disciplines of mathematics, science, materials and systems technology and vocational education and training; with the need for learners to be innovative and entrepreneurial. It places great emphasis upon industry experience and innovative teaching practices.

In particular, the course will:

- provide students with qualifications to teach in one or two of the following areas: mathematics, science, materials and systems technology and vocational education and training programs
- develop unique multi-level partnerships between the University, schools and innovative technological and manufacturing industries, and
- establish for teachers contemporary education training and experiences in dynamic and innovative industries.

The course comprises five broad strands that flow through the four years of the course. These are: education studies, discipline studies; innovation and entrepreneurship studies, practicum studies and industry – workplace experience.

#### **3.2 Description of Course Strands**

##### **3.2.1 Studies in Education**

Studies in Education provide a major study in the education discipline through a compulsory eight unit sequence (120 credit points). They provide participants with the core understandings, capabilities and value systems necessary to facilitate and eventually take leadership roles in establishing lifelong learning for individuals and learning communities. These studies take a broad view about where and how learning happens in contemporary society, the contextual influences and the potential pervasiveness and power of learning communities.

The preparation for professional practice considers diverse learning environments and communities, including regional communities and workplaces other than schools. There is a particular focus on facilitating learning in the 7-12 range in schools and school communities; in mathematics, science, materials technology, systems technology and vocational education and training programs.

Studies in education are integrated with two extended practicum experiences and a cadetship in a business setting. Both practical settings use a team project to link education and discipline studies with an understanding of innovation and entrepreneurship.

Units in the studies in education strand are:

TT511	Introduction to Learning and Teaching
TT512	Young People and Learning Environments
TT513	Designing for Learning
TT514	Assessment and the Promotion of Learning

Two of:

TT611	Mathematics Curriculum
TT612	Science Curriculum
TT613	Technology Curriculum
TT614	VET Curriculum

and

TT815	Collaborative Research and Evaluation
TT816	Global Perspectives on Education, Technology and Enterprise

Studies in education will provide students with an understanding of how young people learn, what motivates them, how to present them with age-appropriate material, how to prepare them to become lifelong learners and how to assess and report their learning progress.

There is also a close relationship between education and discipline studies that ensures iterative development of students' understandings and capabilities in each. The same set of concepts, principles and capabilities in education studies also inform and are informed by discipline studies – like the professional undertakings and practices associated with what constitutes knowledge and learning in particular areas, and how a professional can facilitate learning, assessment and evaluation in the key areas.

This relationship will become apparent in education units that focus specifically on the pedagogy in the key learning areas of mathematics, science, material and systems technology and vocational education and training programs.

### **3.2.2 Discipline Studies**

Discipline studies comprise a six unit sequence (Major Study: 90 credit points) and a four unit sequence (Minor Study: 60 credit points), drawn or selected from the areas of mathematics, science, materials and systems technology and vocational education and training programs. These studies provide the student with a sound knowledge of academic disciplines and the skills and knowledge in key learning areas appropriate to teaching.

#### **3.2.2.1 Mathematics**

##### **The concept:**

Units will be developed around a theme, or area of application. The necessary mathematical skills will be introduced in the thematic context.

All units will be available at more than one level:

- Introductory level (unit codes MA5xx)
- Intermediate level (unit codes MA6xx)
- Advanced level (unit codes MA7xx)

Students will need to demonstrate the skills relevant to the unit theme at the appropriate level as specified in the unit description.

Units offered are in the following seven thematic contexts:

Topic	Code	Levels
Upon the Shoulders of Giants	MA x50	Introductory, Intermediate
Modelling and Change	MA x51	Introductory, Intermediate
Bits, Bytes and Algorithms	MA x52	Introductory, Intermediate
Profit, Loss and Gambling	MA x53	Introductory, Intermediate, Advanced
Shape, Space and Design	MA x54	Introductory, Intermediate
Logic and Imagination	MA x55	Intermediate, Advanced
Modelling Reality	MA x56	Intermediate, Advanced

The rules for sequencing are:

Rules for sequencing within particular courses will be negotiated with Schools concerned. In general, the following rules are proposed:

- Six-unit mathematics major sequence for BEd/BTech
  - No more than three units at introductory level, and at least one unit at advanced level. Each unit must be taken from a different theme
- Four-unit minor in mathematics
  - No more than three units at introductory level, and at least one unit at intermediate level. Each unit must be taken from a different theme.

### 3.2.2.2 Science and Engineering

The following majors and minors are offered:

- Physics Major  
A sequence of 6 units will be taken from the following:
  - EK511 Fundamentals of Engineering (Calculus and Physics)
  - EK565 Fundamentals of Engineering (Statics)
  - EK566 Fundamentals of Engineering (Dynamics)
  - EK580 Fundamentals of Engineering (Electricity and Magnetism)
  - EK691 Fundamentals of fluid mechanics
  - EK762 Instrumentation and Experimental Methods
- Physics Minor  
A sequence of 4 units will be taken from the following:
  - EK511 Fundamentals of Engineering (Calculus and Physics)
  - EK565 Fundamentals of Engineering (Statics)
  - EK566 Fundamentals of Engineering (Dynamics)
  - EK580 Fundamentals of Engineering (Electricity and Magnetism)
  - EK671 Electrical circuits
  - EK672 Engineering Thermodynamics (if Systems major)
  - EK691 Fundamentals of Fluid Mechanics

- Geology Major  
A sequence of 6 units will be taken from the following:
  - SX511 Earth Science
  - SX522 Landscape Evolution
  - SX521 Planet Earth
  - SX523 Earth's Living History
  - SX619 Fieldwork (Flinders Ranges)
  - SX627 Economic Geology
  - SX628 Hydrology
  
- Geology Minor  
A sequence of 4 units will be taken from the following:
  - SX511 Earth Science
  - SX522 Landscape Evolution
  - SX521 Planet Earth
  - SX523 Earth's Living History
  - SX619 Fieldwork (Flinders Ranges)
  
- Chemistry Major
  - SF511 Chemistry I
  - SF512 Chemistry II
  - SF514 Nature of Food
  - SF641 Food Analysis
  - SF642 Food Chemistry
  - SF721 Food Processing Systems III
  
- Chemistry Minor
  - SF511 Chemistry I
  - SF512 Chemistry II
  - and either SF641 Food Analysis and SF642 Food Chemistry  
or SF651 Applied Biochemistry and SF653 Nutrition & Metabolism
  
- Environmental Major
  - SE522 Environmental Management
  - SE520 Australian Biota
  - SE560 Australian Ecosystems
  - SE622 Environmental Ethics & Philosophy
  - SE640 Australian Fauna
  - SE680 Australian Flora
  
- Environmental Minor
  - SE522 Environmental Management
  - SE520 Australian Biota
  - SE560 Australian Ecosystems
  - SE622 Environmental Ethics & Philosophy
  
- Materials Technology Minor  
A sequence of 4 units will be taken from the following:
  - EK570 Fundamentals of Engineering (Materials)
  - EK636 Introduction to Infrastructure Engineering
  - EK676 Mining Technology
  - EK882 Mineral Technology
  - SM401 Mineral Processing
  
- Food Science Major
  - SF511 Chemistry I
  - SF552 Food Science & Nutrition

- SF621 Food Processing Systems I
  - SF622 Food Processing Systems II
  - SF721 Food Processing Systems III
- and either SF722 Product & Process Development  
or SF732 Malting & Brewing Science

- Food Science Minor

- SF552 Food Science & Nutrition
- SF553 Food in Society
- SF553 Food Processing Systems I
- SF622 Food Processing Systems II

- Systems Technology Major

A sequence of 6 units will be taken from the following:

- EK502 Engineering Computing
- EK511 Fundamentals of Engineering (Calculus and Physics)
- EK580 Fundamentals of Engineering (Electricity and Magnetism)
- EK671 Electrical Circuits and Systems
- EK676 Mining Technology
- EK672 Instrumentation and Experimental Methods

- Systems Technology Minor

A sequence of 4 units will be taken from the following:

- EK502 Engineering Computing  
(or CP510 Introduction to Operating Systems)
- EK511 Fundamentals of Engineering (Calculus and Physics)
- EK580 Fundamentals of Engineering (Electricity and Magnetism)
- EK671 Electrical Circuits and Systems
- EK676 Mining Technology
- EK762 Instrumentation and Experimental Methods

Additional units may be developed and offered as required.

### 3.2.2.3 **Materials and Systems Technology** (offered from the TAFE sector)

- TT531 Materials and Processes
- TT532 Wood Construction Technology
- TT533 Plastics Fabrication Technology
- TT534 Electronics and Control Systems
- TT535 Engineering Graphics and Design Principles
- TT536 Technology Design and Development

Additional units may be developed and offered as required.

### 3.2.2.4 **Vocational Education and Training Programs**

Students who enter from a trade background, with qualifications listed in 1.5.3, will, with the addition of Certificate IV in Assessment and Workplace Training, be qualified to teach VET subjects.

Students who enter from Year 12 are not advised to undertake VET units in 2002. The Department of Education, Employment and Training will publish mid-year (2002) their minimum requirements for VET teacher qualifications. Until that time it is recommended that the University not offer these subjects to this group of students until the qualifications issue is clarified.

### 3.2.3 **Practicum Experiences**

Practicum experiences are structured to create sequential opportunities for students to reflect on and develop conceptual understandings, capabilities and values related to learning under the supervision of experienced professionals in

diverse professional and community settings. This will predominantly be in schools, but it may also be in a range of workplaces other than schools and in learning communities and related settings. Students will question and develop their attitudes to and value systems about a range of issues related to professional learning practices. They will progressively develop and reflect on a comprehensive range of professional competencies, and demonstrate capabilities described for schools in state and national guidelines.

Throughout the course students and staff will work in and with regional communities and professional groups to facilitate learning and the establishment of learning communities. The work will complement professional practices in urban settings, and will be informed by national and international best practice. Each student will be encouraged to develop a set of distinctive capabilities related to particular settings, potentially linked with their education studies and curriculum studies and specialisations. These opportunities include international locations, rural or isolated settings and indigenous communities.

Practicum experiences will occur in locations defined by professional relationships between the School of Education and/or University of Ballarat and the learning environment in which students work. This includes explicit understandings about the nature and mutual benefits of collaborative work, work requirements undertaken by students, and roles and responsibilities of university and placement staff.

### **Overview of Practicum**

Practical teaching experience is an integral component of the program. Over four years students progressively develop competence in four areas of teaching. The elements of competency may be summarised as :

- communicating, interacting and working with students and others for learning;
- planning and managing teaching processes and assessment of learning outcomes;
- developing and using professional educational knowledge and values; and
- reflecting, evaluating and planning for continuous improvement.

Developmental progression in these professional attributes takes place in two extended teaching experiences, plus initial observation placements in the first year.

In the **first year** students will undertake an observation round in both a 7-12 and a P-6 setting. In the P-6 setting they will observe the role of language and literacy in the classroom; paying particular attention to how P-6 teachers integrate writing, reading, speaking and listening into all aspects of learning. Their observations will be integrated into the education unit studies in semester one.

Working in schools and/or other educational or training contexts, students will gain the opportunity to:

- observe and interact with learners in a school or other educational setting;
- develop a growing confidence in relationships with learners;
- prepare effective teaching strategies for groups within a class and/or other learning setting;
- consider the structure and organisation of a school and/or other learning situation and begin to identify ways schools and/or learning institutions and society influence each other;
- apply knowledge of teaching skills and strategies gained from core university course units in a professional teaching situation; and

- commence collecting useful materials in a clearly indexed and organised resource file.

The **extended teaching experiences** will be four days per week over two semester periods.

TX620            Teaching Experience and Professional Practice Seminar 1  
TX820            Teaching Experience 2 and Team Enterprise Project

In the *first extended teaching experience*, it is expected that students will begin to observe, plan, teach and evaluate single lessons on a daily basis in rural and regional secondary colleges.

The practicum will cover most weeks in a University semester (approximately 16 weeks), with the student placed in a school 4 days per week, with one day at the university for lectures and professional support. During this time the student will be expected to work with normal classes in their discipline areas and observe teaching in the other key learning areas. By the conclusion of the experience students will be taking responsibility for two lessons per teaching day. In this block of teaching it is expected students will teach mainly at middle school levels (7-10), with some exposure to VCE classes (this may be varied in consultation with the college).

In the *second extended teaching experience* students will be expected to teach at least two lessons per day, with an emphasis on responsibility to plan, deliver and evaluate a sequence of learning. Their teaching will cover the whole range of year levels from 7-12.

This second practicum will also cover most weeks in a University semester (approximately 16 weeks), with the student placed in a school 4 days per week, with one day at the university for lectures and professional support, and is designed to prepare final year students for the transition from student to competent beginning teacher. It is expected that students play an active role in other professional activities within the college. Towards the end of the semester students will be expected to assume a role similar to that expected of a beginning teacher. During this practicum students will also undertake the Team Enterprise Project.

### **3.2.4 Industry Placement (Cadetship)**

In the fourth year of the course, students, especially those without prior significant work experience, will undertake a cadetship in industry for six months. During this placement, the student will work for four days each week in a business or industrial setting, and spend one day at the University. During the placement, the students will undertake a multidisciplinary team project (see 3.2.7.1 below).

### **3.2.5 Innovation and Entrepreneurship Studies**

The introduction of Innovation and Entrepreneurship Studies into this program has several objectives, namely to:

- provide for students contemporary education training and experiences in dynamic and innovative industries;
- give students experiences in multi-level learning partnerships;
- link education and discipline studies to an industrial experience;
- broaden the students knowledge and understanding of contemporary learning environments;
- enhance the learning links between schools, industry and the community;
- improve the resourcefulness of our teachers;
- provide a possible pathway into industry for our students; and
- provide students with a third teaching discipline.

The following units in innovation and entrepreneurship studies will be undertaken:

BS530	Technology in Society
BS636	Innovation and New Venture Creation
BS637	Innovation and Technological Change
BS730	Technology Commercialisation
BS731	Multidisciplinary Team Project: Technology Development in Practice

### **3.2.6 Teaching Support Unit**

The following semester unit has been included to assist students develop allied skills.

#### **3.2.6.1 Statistical, Information and Communication Tools**

The unit TT515 Tools for Learning in Mathematics, Science and Technology is designed to provide core skills in information and communication technologies, science, mathematics and statistics for teachers. Students will gain skills in learning technologies to enhance student learning and assessment, and teaching organisations. It will also improve their understanding and interpretation of commonly used statistical information in schools.

An understanding of scientific method will also enhance their appreciation of science in our community and its importance to accumulated knowledge and discovery.

### **3.2.7 Team Projects**

#### **3.2.7.1 Multidisciplinary Team Project (MTP)**

This project will be undertaken by those students who gain a six month cadetship in industry. It will be a collaborative project between the student, the University and the business. It draws upon the discipline knowledge and skills acquired by the student after 3 years (FTE) study and the needs of the business.

The project involves identification of an opportunity and the required mobilisation of resources to implement it. The critical feature of the unit is a technological, operational and business plan for implementation of a new technology in either a new product or new process context.

During this placement, students undertake employment in business to gain first hand industry experience and to apply the theory they have learnt. Students will work four days per week during the university semester, with one day per week for lecture and professional support at the University. Students will be entitled to the normal benefits, terms and conditions offered by the employer.

It is anticipated that students will receive a training wage, paid by the business or industry. This placement meets the criteria for work experience in industry (see Appendix F) and therefore will be HECS exempt.

Whilst students are ultimately responsible for obtaining their placement, the Schools of Education and Business will assist by liaising with employers and by providing guidance throughout the experience.

#### **3.2.7.2 Team Enterprise Project (TEP)**

The TEP is part of the second extended teaching experience and aims to apply the students' knowledge and skills in discipline education and innovation and entrepreneurship studies to a school based project.

The nature of the project will be negotiated between the student and the college and should embrace the following guidelines:

- The project should be innovative, but consistent with school priorities.
- It should aim to improve school student learning outcomes.
- It should draw on the skills acquired by the student in her/his discipline, education and innovation and entrepreneurship studies.
- It should be consistent with the workload expectations of the student.
- It should involve cooperative work with colleagues, students and where appropriate the wider school community.

### **3.3 Emphasis on Literacy**

The development of skills and understanding in literacy will be an important feature of the course. All units will sensitise students to aspects of the relevant discourses (e.g. science, education, technology), and assist students to become competent users of appropriate terminology. Communication skills relevant to the focus of the course (e.g. writing reports to business or to parents) will be developed and monitored.

### **3.4 Integration Across Strands**

The compulsory course units in Innovation and Education provide a common thematic and integrating mechanism for the course. All students will also be required to complete a Team Enterprise Project, which is part of the second extended teaching experience.

### **3.5 Ability to Develop Special Interests**

Within the discipline and curriculum studies students will focus on subjects according to their interest. Within the course structure there is the provision of one elective unit, which may be selected from other faculties.

## 4. Course Structure: The Units and Regulations

### 4.1 Course Regulations, BEd/BTech

Refer to Appendix E.

### 4.2 List of Units in Course Structure, BEd/BTech

#### *First Year*

TT511	Introduction to Learning and Teaching	15 credit points
TT512	Young People and Learning Environments	15 credit points
TT513	Designing for Learning	15 credit points
TT514	Assessment and the Promotion of Learning	15 credit points
TT515	Tools for Learning in Mathematics, Science and Technology	15 credit points
BS530	Technology in Society Seminar	15 credit points
Major Discipline Sequence 1a & b		30 credit points

#### *Second Year*

Two of:		15 credit points each
TT611	Mathematics Curriculum	
TT612	Science Curriculum	
TT613	Technology Curriculum (from 2003) VET Curriculum	
BS636	Innovation and New Venture Creation	15 credit points
BS637	Innovation and Technological Change	15 credit points
Major Discipline Sequence 1c & d		30 credit points
Minor Discipline Sequence 2a & b		30 credit points

#### *Third Year*

BS730	Technology Commercialisation	15 credit points
Education Elective		15 credit points
Major Discipline Sequence 1e		15 credit points
Minor Discipline Sequence 2c		15 credit points
TX620	Teaching Experience and Professional Practice Seminar 1	60 credit points

#### *Fourth Year*

TT815	Collaborative Research and Evaluation	15 credit points
TT816	Global Perspectives on Education, Technology and Enterprise	15 credit points
Major Discipline Sequence 1f		15 credit points
Minor Discipline Sequence 2d		15 credit points
BS731	Multidisciplinary Team Project: Technology Development in Practice* (15 credit points) * In conjunction with Cadetship/Industrial Experience	60 credit points

#### *Fifth Year*

TX820	Teaching Experience 2 and Team Enterprise Project	60 credit points
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### 4.3 BEd/BTech Structure Diagram

#### 4.3.1 Overview of Course Structure

See overleaf.

## Overview of Course Structure for BEd/BTech

Year 1		Year 2		Year 3		Year 4		Year 5
Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2	Semester 1	Semester 2	Semester 1
Discipline 1a	Discipline 1b	Discipline 1c	Discipline 1d	Extended Teaching Period	Discipline 1e	Cadetship/ Industrial Experience	Discipline 1f	Extended Teaching Experience
ICT Maths / Science / Statistics Tools	Innovation 1	Discipline 2a	Discipline 2b		Discipline 2c		Discipline 2d	
Education 1	Education 3	Innovation 2	Innovation 3		Innovation 4		Education 7	
Education 2	Education 4	Education 5	Education 6	Professional Practice Seminars (including OHS)	Elective	Multidisciplinary Team Project (Innovation 5)	Education 8	Team Enterprise Project

### 4.3.2 Course Structure for Students with Advanced Standing

Year 1		Year 2		Year 3	
<i>Semester 1</i>	<i>Semester 2</i>	<i>Semester 1</i>	<i>Semester 2</i>	<i>Semester 1</i>	<i>Semester 2</i>
Discipline 2a	Discipline 2b	Discipline 2c	Extended Teaching Period	Discipline 2d	Extended Teaching Period
ICT Maths / Science / Statistics Tools	Innovation 1	Innovation 2		Industrial and/or Technological Design	
Education 1	Education 3	Education 5		Innovation 4	Team Enterprise Project
Education 2	Education 4	Innovation 3*	Education 6	Education 7	Education 8

\* All units are covered, but for scheduling purposes the order in Year 1, 2 and 3 may need reorganisation.

## Appendix A: Academic Staff

### (Acting) Head of School

Assoc. Professor Helen Hayes BA *Qld*, Dip.Ed *UNE*, M.Ed, PhD *Tor.*, MACE

### Academic Staff

Mr Clem Barnett BA, Dip.Ed *Monash*, BA *Flin.*, Dip.Soc.Ed *Sturt*, M.Ed *Melb.*

Ms Robyn Brandenburg Dip.T *Aquinas Coll Ballarat*, B.Ed *ICE Ballarat*, M.Ed *Deakin.*

Ms Maryann Brown BA *Monash*, G.Dip.Ed *BCAE*, G.Dip.SpecialEd *Melb*, M.Ed *Ballarat*

Dr Wendy Crebbin TSTC *SCV*, BA *BUC*, Dip.Phys.Ed *Melb*, G.Dip.Ed.Admin, M.Ed.Admin *Deakin*, PhD *Ballarat*, MACE

Ms Christina Davidson Dip.T *Riverina College of Advanced Education*, B.Ed *South Australia*, MA(TESOL) *UTS*

Dr Barry Golding BSc(Hons) *Melb*, Dip.Ed. *Melb*, M.Env.Sci. *Monash*, BA *Deakin*, Grad.Dip.Ed.Admin. *Hawthorn*, PhD *Melb*

Mr Garry Henderson TPTC *BallaratTC*, B.Sc(Chem) *BCAE*, M.Ed *Deakin*

Dr Colin Lankshear BA *Canterbury*, MA *Canterbury*, PhD *Canterbury*, M.Ed(TESOL) *QUT*

Mr Zheng Lin BA *Fujian Teachers University*, MA *Reading*, M.Phil. *Reading*

Ms Amanda McGraw BA(Hons) *Deakin*, Dip.Ed. *LaTrobe*, MA *Deakin*

Ms Lynne Noone BA *Monash*, TITC *ToorakTC*

Mr Rupert Russell B.Teach, B.Comp *Ballarat*

Ms Janette Ryan BA(Hons) *Melb*, B.Ed. *Deakin*

Dr Patricia Smith Dip.Ed.(Primary) *Victoria College*, B.Ed. *Victoria College*, Dip.Ed.Admin. *Hawthorn*, M.Ed. *RMIT*, PhD *RMIT*

Dr S. Caroline Taylor BA *ACU*, BA(Hons) *Ballarat*, Grad.Cert.Ed.(Tertiary Ed.) *Ballarat*, Grad.Dip.Ed.(Tertiary Ed.) *Ballarat*, PhD *Ballarat*

Mr Ross Whitefield BA, Dip.Ed, B.Ed *Monash*, M.Ed.St *LaTrobe*

Ms Margaret Zeegers BA *LaTrobe*, Dip.Ed. *LaTrobe*, M.Ed. *Deakin*

### Academic Associates

To be advised.

## Appendix B: Consultations

Funding for the introduction of this course came from the Commonwealth Government's Backing Australia's Ability initiative. Support for the initial application came from:

- The Department of Education, Employment and Training (Central Highlands Wimmera Regional Office)
- Australia's Chief Scientist, Dr Robin Batterham
- The Catholic Education Office (Ballarat Diocese)
- Mount Clear Secondary College
- Sebastopol Secondary College
- Warracknabeal Secondary College, and
- Ballarat Secondary College

After the success of the application the following have acted in a consultative capacity: University Of Ballarat:

- School of Education staff
- School of Business: Professor Julian Lowe
- School of Information Technology and Mathematical Sciences: Professor Sid Morris and Associate Professor Lyn Roberts
- School of Science and Engineering: Professor Martin Westbrooke
- School of Construction, Manufacturing and Technology: Mr David Manterfield and Mr Kelvin Jarvis
- Pathways Officer: Mr Chris Dickinson
- Vice-Chancellor's Office: Professor Wayne Robinson, Deputy Vice Chancellor (Academic and Research)

External:

- Victorian Institute of Teaching: Ms Kathy Liley
- Regional Director, Department of Education, Employment and Training:
  - Mr Malcolm Millar
  - Mr Rob Blachford
  - Mr Eric McLeod
  - Mr John McClure
- Catholic Education Office (Ballarat Diocese): Mr Tony Brandenburg
- Ballarat Business Community:
  - Ms Elizabeth Lewis-Gray (Gekko Systems Pty Ltd)
  - Mr Paul Mracek (Bendix Mintex Pty Ltd)
- Principals and teachers from government and private schools:
  - Mr Brendon Ryan
  - Mr Fenton Colliton
  - Mr Ed Pearce
  - Mr John Shannon
  - Mr Bernie Davern
  - Ms Carmel Hemenstall
  - Mr Laurie Bester
  - Mr Garry Taylor
  - Mr Kim Fenoughty
  - Ms Marilyn Vallance
  - Mr Leo Casey
- Qualifications Assessment Branch DEET Victoria: Mr Barry Parker
- Australian Education Union: Mr John Graham
- Project Officer: Mr Gary Allen

## Appendix C: Unit Outlines

<b>UNIT CODE AND TITLE:</b>	<b>BS530 Technology in Society Seminar</b>
<b>AUTHOR:</b>	<b>Prof Julian Lowe</b>
<b>SCHOOL:</b>	<b>Business</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

### OBJECTIVES:

This unit is designed to enable students to:

#### Knowledge

- Understand the role of technology in society
- Develop specific knowledge of technology trends in key economic, social and technological sectors

#### Skills

- Identify trends
- Assess the impact of technology and market maturity
- Apply systems approaches to technology evaluation

#### Attitudes

- Value technology as part of the wealth creation process
- Value interdisciplinary approaches to technology and its development

### CONTENT:

Topics and subtopics:

- History of industry and its relationship to science and technology
- Relationship between science and technology and evolution of techno-science.
- The institutions of science and technology and its institutionalisation in a public and private context
- National innovations systems – Singapore, Japan, US Australia
- Dynamic competitive advantage; clusters and clustering
- Critical industry case studies – Automotive, flat glass, watches, electronics and computing, brewing, synthetic materials, single cell proteins

### LEARNING TASKS AND ASSESSMENT:

Learning Task	Assessment	Weighting
Investigation analysis and research	Assignment and seminar paper	40-60%
Seminar and reading of seminar papers	Critique of seminar papers	40-60%

### TEACHING APPROACHES:

Two hour seminar/workshop per week.

### REFERENCES:

- Freeman, C., & Louca, F. (2001). *As time goes by: From the industrial revolution to the information revolution*. Oxford: Oxford University Press.
- Freeman, C., & Soete, L. (1997). *The economics of industrial innovation*. 3rd ed. London: Pinter Publicity.
- Tidd, J., Bessant, J., & Pavitt, K. (1997). *Managing innovation*. Chichester: John Wiley.
- Howells, J. (1994). *Managers and innovation*. London: Routledge.

**Website**

Economic and Social Research Council (ESRC) Vol. 1,2,3,4,5 – [www.bprc.warwick.ac.uk](http://www.bprc.warwick.ac.uk)

**UNIT CODE AND TITLE:** BS636 Innovation and New Venture Creation  
**AUTHOR:** Prof Julian Lowe  
**SCHOOL:** Business  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 15

**OBJECTIVES:**

This unit is designed to enable students to:

**Knowledge**

- Outline what technology entrepreneurs do
- Describe the critical dimensions of technological entrepreneurship
- Assess the role of high tech new firms in society
- Recognise the different contexts on which entrepreneurs act
- Analyse why entrepreneurs start new technology based ventures
- Consider how entrepreneurs achieve their goals
- Understand the limits to entrepreneurial action

**Skills**

- Assess the basis of an innovation becoming a successful enterprise
- Define the critical forces in entrepreneurial success
- Identify and determine financial and non financial resources available to entrepreneurs
- Determine critical marketing, operations and organisational tasks in setting up a new venture
- Develop criteria and evaluate new technology ideas
- Capture technology parameters of ventures in a business plan

**Attitudes**

- Adopt an 'entrepreneurial' view of business
- Value the creative and critical evaluation of information
- Appreciate the ethical and legal dimensions of entrepreneurship

**CONTENT:**

Topics and subtopics:

- Evaluating technology ideas
- The entrepreneurial process
- Recognising and assessing the financial requirements of new ventures
- Intellectual property protection
- Developing a marketing and operating plan
- The entrepreneur, the team and the organisation
- Going beyond start up

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Analysis of theory and practice of technology entrepreneurship	Written assignment	40%
Working in a team to produce an opportunity assessment of a new technology venture and preparing a draft strategy for future action	Oral presentation of the strategic plan (team)	30% (team)
	Written report reflecting on the process of developing the business plan (individual)	30% (individual)

**TEACHING APPROACHES:**

This unit will involve lectures, interactive tutorials and a significant block devoted to a team project.

Class sessions will be mainly used for discussions to clarify concepts, ideas, methods, etc., elaborated in the textbook. The focus of the unit is to understand the fundamentals of technological entrepreneurship and new venture creation and apply these to a potential new venture.

**REFERENCES:**

Kao, J. (1989). *Entrepreneurship, creativity, and organisation: Text, cases and readings*. Englewood Cliffs, New Jersey: Prentice Hall.

McGrath, R.G., & MacMillen, I. (2001). *The entrepreneurial mindset*. Boston: Harvard Business School Press.

Roberts, E. (1991). *Entrepreneurships in high technology*. Oxford: Oxford University Press.

Sahlman, W.A. & Stevenson, D.F. (1991). *The entrepreneurial venture*. New York: McGraw-Hill.

Timmons, J.A. (1999). *New venture creation: Entrepreneurship for the 21<sup>st</sup> Century*. Chicago:Irwin.

**UNIT CODE AND TITLE:** BS637 Innovation and Technological Change  
**AUTHOR:** Prof Julian Lowe  
**SCHOOL:** Business  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 15

**OBJECTIVES:**

**Knowledge**

- Understand the driver of technology change and innovation
- Understand the innovation and commercialisation process

**Skills**

- Recognise the interdependence between technology and business
- Design appropriate organisational options
- Assess alternative technology strategies

**Values and Attitudes**

- Have a holistic and systems based view of technology processes
- Value economic, social and technological aspects of innovation

**CONTENT:**

- Sources of innovation: technology and science push, demand pull, while systems approaches and 5<sup>th</sup> generation models
- Dynamic clusters and technology change
- Patterns of change in technological markets: S curves and technology trajectories, market evolution, disruptive technologies
- Dominant designs and the evolution of standards. Impact on competition in markets and the development of technology
- Innovation and the theory of the firm

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Investigation, analysis and research	Essay	40%
Lectures, prescribed reading, tutorials and seminars	Examination	60%

**TEACHING APPROACHES:**

Lectures, seminars and industry visits.

**REFERENCES:**

- Dodgson, M., & Bessant, J. (1996). *Effective innovation policy: A new approach*. London: International Thomson Business Press.
- Dosi, G., Teese, D., & Chytry, J. (1998). *Technology, organisation and competitiveness*. Oxford: OUP.
- Freeman, C., & Soete, L. (1997). *The economics of industrial innovation* (3<sup>rd</sup> ed). London: Pinter Publicity.
- Tidd, J., Bessant, J., & Pavitt, K. (1997). *Managing innovation*. Chicester: John Wiley.

**Journals**

- R & D Management*  
*International Journal of Innovation Management*

**UNIT CODE AND TITLE:** BS730 Technology Commercialisation  
**AUTHOR:** Prof Julian Lowe  
**SCHOOL:** Business  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** BS637 Innovation and Technological Change  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 15

**OBJECTIVES:**

**Knowledge**

- Understand the link between invention, innovation and enterprise
- Understand the key aspects of intellectual property, complementary assets and commercialisation strategies

**Skills**

- Project management technologies
- Financial appraisal skills
- Opportunity evaluation processes

**Values and Attitudes**

- Integration and concurrency
- Contingent basis of technology commercialisation
- Uncertainty and risk taking

**CONTENT:**

- Industry and the competitive environment
- Emerging, stable and declining industry environments
- Convergence and divergence of technologies: the case of genomics and bio-information
- Capturing value: Intellectual property, complementary assets, external linkages and raising finance
- Organising for innovation: Managing the internal process, building capability, developing effective marketing
- Dealing with discontinuities in technologies and markets
- Technology strategy in practice
- Critical organisation and enterprise case studies: EMI and the CT scanner, Intel, 3M, Nintendo and Sega, Polaroid Corporation, Canon, British Biotechnology, Melbourne IT

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Investigation, analysis and research	Assignment	40%
Investigation, analysis and research	Project	60%

**TEACHING APPROACHES:**

Lectures, seminars and supervised project work

**REFERENCES:**

- Clark, K., & Wheelwright, S. (1995). *The product development challenge*. Boston: Harvard Business School Press.
- Dodgson, M., & Bessant, J. (1996). *Effective innovation policy: A new approach*. London: International Thomson Business Press.
- Jolly, V.K. (1997). *Commercialising new technologies*. Boston: Harvard Business School Press.

Roberts, E. (1991). *Entrepreneurs in high technology*. Oxford: Oxford University Press.

Teece, D.J. (2001). *Managing intellectual capital – Organisational, strategic and technological dimension*. Oxford: Oxford University Press.

Utterback, J. (1994). *Mastering the dynamics of innovation*. Boston: Harvard Business School Press.

**UNIT CODE AND TITLE:** BS731 Multidisciplinary Team Project:  
Technology Development in Practice

**AUTHOR:** Prof Julian Lowe

**SCHOOL:** Business

**COURSE:** Bachelor of Education/Bachelor of Technology

**PREREQUISITE(S):** BS636 Innovation and New Venture Creation

**COREQUISITE(S):** Nil

**EXCLUSION(S):** Nil

**DURATION:** One Semester

**CREDIT POINTS:** 15

**OBJECTIVES:**

**Knowledge**

- The processes and barriers to the commercial exploitation of technology
- The dynamics of working in teams
- Linking ideas and action

**Skills**

- Identify technology based opportunities
- Assess appropriate routes to technology exploitation
- Work with partners, suppliers and financiers
- Develop commercially credible business plans
- Develop skills in valuation, financial appraisal and management

**Values and Attitudes**

- Appreciate risk taking and wealth creation
- Have entrepreneurial values
- Value pioneering and foresight

**CONTENT:**

The unit is constructed around the planned implementation of a new technology based venture or process application. It involves identification of an opportunity and the required mobilisation of resources to implement it. The critical feature of the unit is a technological, operational and business plan for implementation of a new technology in either a new product or new process context.

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Opportunity assessment and evaluation	Team based: Written Business and Technology Plan	60%
Investigation, analysis and reflection	Individual: Commentary on Business and Technology Plan	40%

**TEACHING APPROACHES:**

A team based project supported by academic and work based supervisors. The assessment is wholly project based.

**REFERENCES:**

- Clark, K., & Wheelwright, S. (1995). *The product development challenge*. Boston: Harvard Business School Press.
- Jolly, V.K. (1997). *Commercialising new technologies*. Boston: Harvard School Press.
- Timmons, J.A. (2001). *New venture creation: Entrepreneurship for the 21<sup>st</sup> Century*. Chicago: Irwin.

**Journals**

*Research Policy*

*R&D Management*

*Sloane Management Review*

*Journal of Business Venturing*

<b>UNIT CODE AND TITLE:</b>	<b>TT511 Introduction to Learning and Teaching</b>
<b>AUTHOR:</b>	<b>Maryann Brown</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

### **OBJECTIVES:**

To enable students to:

- become enquirers into professional practice with a sound understanding of the theoretical and practical complexity of the learning and teaching interaction;
- participate in planning for learning and to investigate how learners interpret, understand and make meaning from the experience;
- understand and plan for teaching and learning in school as part of the process of lifelong learning;
- become ethical and professional educators who are capable of critiquing educational developments and responding effectively to change;
- investigate the changing roles of teachers and learners in the contemporary school context, based on a range of theoretical constructs of education and society;
- reflect upon, and critique, the value assumptions within different approaches to learning and teaching through an analysis of their own initial observations of teaching and of current educational issues.

### **CONTENT:**

- Exploration of contemporary learning theory and practice.
- Exploration of research methodology and ways to enquire into and reflect upon learning styles and professional practice.
- Connection with schools for observation, research and teaching experiences.
- Non-teaching observation and development of 'big picture' questions about schools and learning.
- Initial planning, organising, monitoring, assessing and evaluating learning in a formal learning environment.
- Understanding and responding to students and their individual and social learning needs.
- Personal beliefs and theories about teaching and how they impact on practice.
- Contemporary strategies for engaging and enhancing learning for all learners.
- Exploration of the possibilities and function of information technology use in planning for learning.

### **LEARNING TASKS AND ASSESSMENT:**

The learning and assessment tasks will model flexible approaches and be developed around learning communities created by utilising information and communication technologies. All students will be required to develop and maintain individual webpages to submit tasks in multimedia formats.

Learning Task	Assessment	Weighting
Researching schools and learning – 5-8 days non-teaching / observation in schools and developing a series of questions which form the basis of personal research into learning and teaching.	School-based research project report.	60%
	Establishing a personal website on learning and teaching.	S/N
Learning from and with others	Participation in class learning groups	40% (weighting of components negotiable)
	Presentation to group on learning styles and/or teaching strategies	

### TEACHING APPROACHES:

The teaching/learning methods used include:

- lecture/discussion
- personal reflection
- using the World Wide Web
- individual & small group tutorials
- participant observation of teaching in pre-school, primary and secondary settings.
- peer-teaching presentations
- interaction with schools and community groups

### REFERENCES:

#### Books

- Biggs, J & Moore, P. (1993). *The process of learning* (3<sup>rd</sup> ed.). Sydney: Prentice Hall.
- Board of Studies. (2000). *Curriculum and standards framework II*. Carlton, VIC: Board of Studies.
- Boomer, G., Lester, N., Onore, C. & Cook, J. (1992). *Negotiating the curriculum: Educating for the 21<sup>st</sup> century*. London: Falmer Press.
- Cohen, L. & Spencer, L. (1998). *Assessment of children and youth*. New York: Longman.
- Collins, J., Hammond, M. & Wellington, J. (1997). *Teaching and learning with multimedia*. London: Routledge.
- Groundwater-Smith, S., Cusworth, R. & Dobbins, R. (1998). *Teaching challenges and dilemmas*. Sydney: Harcourt Brace.
- Groundwater-Smith, S., Brennan, M., McFadden, M. & Mitchell, J. (2001). *Secondary schooling in a changing world*. Marrickville, NSW: Harcourt Australia.
- Halsall, R. (Ed). (1998). *Teacher research and school improvement: Opening doors from the inside*. Buckingham, UK: Open University Press.
- Hatton, E. (Ed). (1998). *Understanding teaching*. (2<sup>nd</sup> ed.). Sydney: Harcourt Brace.
- Hinde, J., Reynolds, R. & Weckert, C. (2001). *Enriching learning*. Katoomba: Social Science Press.
- Hopkins, D. & Harris, A. (2000). *Creating the conditions for teaching and learning*. London: David Fulton Publishers.
- Killen, R. (1998). *Effective teaching strategies: Lessons from research and practice*. Katoomba: Social Science Press.
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- Loughran, J. (1996). *Developing reflective practice: Learning about teaching through modeling*. London: Falmer Press.
- Loughran, J. (Ed). (1999). *Researching teaching: Methodologies and practices for*

- understanding pedagogies*. London: Falmer Press.
- Marsh, C. (2000). *Handbook for beginning teachers* (2<sup>nd</sup> ed.). Frenchs Forest, NSW: Pearson Education Australia.
- McCormick, C & Pressley, M. (1996). *Educational psychology: Learning, instruction, assessment*. New York: Longman.
- Neville, B. (1992). *Educating psyche: Emotion, imagination and the unconscious in learning*. Melbourne. Collins Dove.
- Posner, G. (1996). *Field experience: Methods of reflective teaching* (4th ed). New York: Longman.
- Postman, N. & Weingartner, C. (1971). *Teaching as a subversive activity*. London: Penguin.

### **Websites**

Board of Studies – [www.bos.vic.edu.au](http://www.bos.vic.edu.au)

Victorian Department of Education, Employment and Training site – [www.sofweb.vic.edu.au](http://www.sofweb.vic.edu.au)

From Now On – The Educational Technology Journal [www.fno.org](http://www.fno.org)

<b>UNIT CODE AND TITLE:</b>	<b>TT512 Young People and Learning Environments</b>
<b>AUTHOR:</b>	<b>Helen Hayes and Maryann Brown</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

### **OBJECTIVES:**

This unit is designed to encourage an inquiring attitude to the study of policies, theories and research related to young people as adolescents in the school, in society and the effect of different learning environments on their development. In particular, it is expected that student-teachers will:

- develop insights into the tasks and problems experienced by adolescents, with special reference to the school environment;
- theorise their experience as students in the post primary school setting and other learning environments;
- reflect critically and practically on relevant theory and research which relates to adolescent learning and development and the range of learning environments;
- deepen their theoretical and practical understanding of those aspects of the teacher-student relationship which pertain to group management, attention to individuals, and communication with parents and the broader community;
- acquire a working knowledge of the resources available to assist teachers in their work with young people;
- adopt a responsible attitude to their future role as teachers of adolescents and be familiar with the moral and legal aspects of that role;
- appreciate the inter-connected and complex nature of learning, curriculum content and teaching in the classroom, school and community contexts;
- pursue research, either singly or in groups, into some aspect of adolescence and the influence of different learning environments.

### **CONTENT:**

The unit content will be organised into the following four modules:

- 1) Images and constructions of adolescence
  - a) Consideration of the images of young people as presented in the media and the effect of this presentation on the ways in which adolescents define themselves.
  - b) A critical overview of some theories of adolescence.
  - c) Seeing the adolescent whole - teaching the 'whole' adolescent.
- 2) Adolescence in context
  - a) An overview of the social and demographic context in which young people are growing from childhood to adulthood in Australia at the beginning of the 21st century.
  - b) Critical analysis of research (including their own) into the effects on adolescence of youth policy, media presentation, school and other learning environments and teacher-student relationships
  - c) Current issues/discussions.
- 3) Growing up and 'becoming somebody'
  - a) Aspects of mental health in adolescence.
  - b) Consideration of approaches to informal counselling, pastoral care and management/discipline, and evaluation of these approaches in the light of educational and ethical questions.
- 4) Attentiveness and caring for difference
  - a) Reflection on theories of the adolescent as learner, with a focus on individual differences and ways of catering for these.

- b) Study of relevant research on the effects that differences in gender and social, linguistic and cultural background have on young people's learning and motivation.
- c) 'Exceptionality' in adolescence and the teacher's response.
- d) Working with parents, school communities and the wider community.

**LEARNING TASKS AND ASSESSMENT:**

Assessment will be based on a contract drawn up between the student and the lecturer(s) and will comprise the following elements: participation, individual tutorial presentation, depth study. All weightings are negotiable.

Learning Task	Assessment	Weighting
Assembling a portfolio of resources	Display of resources at the end of the year	Ungraded
Communicating questions and findings of personal research with fellow-students	Oral presentation to small group	Negotiable
In-depth research into an aspect of /issue to do with adolescence and learning environments.	Depth study in negotiated format	Negotiable

**TEACHING APPROACHES:**

Lectures (including guest speakers); tutorial discussions; videos and other audiovisual presentations; small group oral presentations by students; reading; personal research.

**REFERENCES**

**Books**

Batten, M. & Russell, J. (1995). *Students at risk: A review of Australian literature 1980-1994*. Hawthorn: Australian Council for Educational Research.

Bessant, J., Sercombe, H. & Watts, R. (1998). *Youth studies: An Australian perspective*. South Melbourne: Longman.

Bowd, A. (1990). *Exceptional children in class* (2nd ed.). Melbourne: Hargreen.

Casey, K. (1994). *Teaching children with special needs: An Australian perspective*. Wentworth Falls NSW: Social Science Press.

Danesi, M. (1994). *Cool: The signs and meanings of adolescence*. Toronto, Canada: University of Toronto Press.

Fuller, A. (1998). *From surviving to thriving: Promoting mental health in young people*. Camberwell, VIC: ACER Press.

Gilbert, R. & Gilbert, P. (1998). *Masculinity goes to school*. St Leonards, NSW: Allen & Unwin.

Heaven, P.C. & Callan, V.J. (1990). *Adolescence: An Australian perspective*. Sydney: Harcourt Brace Jovanovich, Publishers.

Irving, T., Maunders, D. & Sherington, G. (1995). *Youth in Australia: Policy, administration and politics*. Melbourne: Macmillan.

McLeod, J. & Malone, K. (Eds.). (2000). *Researching youth*. Hobart, TAS: Australian Clearinghouse for Youth Studies.

Miles, S. (2000). *Youth lifestyles in a changing world*. Buckingham, UK: Open University Press.

Pipher, M. B. (1994). *Reviving Ophelia: Saving the selves of adolescent girls*. New York: Putnam.

Shucksmith, J. & Hendry, L. B. (1998). *Health issues and adolescents: Growing up, speaking out*. London: Routledge.

Skelton, T. & Valentine, G. (Eds.). (1998). *Cool places: Geographies of youth cultures*. London: Routledge.

Slee, R. (1995). *Changing theories and practices of discipline*. London: The Falmer Press.

Sykes, H. (Ed.). (1993). *Youth homelessness: Courage and hope*. Carlton:

Melbourne University Press.

Wexler, P. (1992). *Becoming somebody: Toward a social psychology of school*. London: The Falmer Press.

Wyn, J. & White, R. (1997). *Rethinking youth*. St Leonards, NSW: Allen & Unwin.

Yates, L. (1993). *The education of girls: Policy, research and the question of gender*. Hawthorn, VIC: ACER.

### **Biographical/Case Study Material**

Cameron, H. (Ed.). (1998). *Different but the same: Young people talk about living with serious illness*. Port Melbourne, VIC: Thomas C. Lothian Pty Ltd.

Deveson, A. (1991). *Tell me I'm here*. Ringwood: Penguin Books.

Embling, J. (1978). *Tom*. Ringwood: Penguin Books.

Giles, F. (Ed.). (1992). *Melanie*. Sydney: Picador Australia.

### **Journals**

*Connect: Supporting Student Participation*

*Journal of Youth Studies*

*The Australian Journal of Indigenous Education* (formerly *The Aboriginal Child at School*)

*Youth Studies Australia* (also available at <http://www.acys.utas.edu.au/ncys/ysa>)

### **Websites**

<http://www.sofweb.vic.edu.au/welfare/>

<http://www.acys.utas.edu.au/>

<http://yarn.edfac.unimelb.edu.au/>

<b>UNIT CODE AND TITLE:</b>	<b>TT513 Designing for Learning</b>
<b>AUTHOR:</b>	<b>Helen Hayes</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

### **OBJECTIVES:**

This unit is designed to enable students to:

- investigate and explain the main features of effective and responsive curriculum design, development and delivery;
- investigate and explain the relationship between school curriculum decisions and contemporary issues and trends in the wider society;
- understand that curriculum is always a field of contestation between diverse values and beliefs;
- analyse historical and contemporary patterns of school in Australia;
- analyse and critically explain school curriculum policy in Australia, with particular reference to Victorian policy;
- consider how organisational patterns in schools and school systems influence curriculum;
- analyse and critically explain the responsibilities of school communities in relation to school curriculum development and evaluation;
- explore the interrelationships among curriculum, pedagogy and assessment;
- adopt and articulate a considered personal stance on significant school curriculum issues;
- design and develop curriculum materials/resources;
- develop processes of curriculum evaluation;
- develop and express a view of themselves as a reflective professional practitioner, who is able to think critically and constructively in and on action, applying knowledge, expertise and personal theories of professional practice; and
- initial analysis and exploration of contemporary issues in post-primary learning and teaching, including Middle Years, vocational education, literacy and numeracy across the curriculum, integration of technology, gender issues.

### **CONTENT:**

- Concepts, theories and models of curriculum: academic/vocational; input/outcome-based; mandated/negotiated.
- Curriculum policy in Victoria: evolution in curriculum policy from the 1970s to the present; *Curriculum and Standards Framework II*; Victorian Certificate of Education; post-compulsory schooling; Vocational Educational and Training.
- Curriculum in society: historical patterns of and justifications for schooling; curriculum and the information revolution; schooling in a democratic society; community involvement in curriculum decision making.
- Curriculum and competing values: concept of 'basics'; patterns of resourcing; issues of justice and inclusiveness.
- Organisation: system and school decision-making structures; patterns of school organisation; pathways and links with TAFE and higher education.
- Contemporary curriculum issues: (for example) middle years concerns and strategies; literacy and numeracy across the curriculum; integration of information and communication technologies; curriculum for students 'at risk'; giftedness and special needs curriculum; lifelong learning.
- Curriculum, pedagogy and assessment: the ways in which these three 'sign systems' affect each other; forms of assessment; assessment for learning.

- Evaluation and ongoing review of curriculum: action research as a form on ongoing reflection and review.

### LEARNING TASKS AND ASSESSMENT:

Learning Task	Assessment	Weighting
Critical reading of historical and contemporary texts on curriculum and curriculum issues (individually and as part of a reading circle)	Portfolio of writing (or equivalent) on curriculum issues, based on reading	30%
Participation in a group research project ('rich task') to develop curriculum resources/guidelines around a curriculum topic/issue	Group narrative (20%) and individual evaluation (20%) of the process	40%
Group presentation of research findings and demonstration of curriculum resource	Conference presentation with written handout	30%

### TEACHING APPROACHES:

Lectures (including guest speakers); workshops; tutorial discussions; reading circles; group work; independent reading and writing.

### REFERENCES:

#### Books

- Board of Studies. (1999). *Curriculum and standards framework II*. Melbourne: Author.
- Boomer, G. (Ed.). (1992). *Negotiating the curriculum: Educating for the 21<sup>st</sup> century*. London: The Falmer Press.
- Brady, L. & Kennedy, K. (1999). *Curriculum construction*. Sydney: Prentice Hall.
- Connors, L. (Chair). (2000). *Public education: The next generation* (Report of the Ministerial Working Party). Melbourne: Accountability and Development Divisions, Department of Education, Employment and Training.
- Delors, J. (Chair). (1996). *Learning: The treasure within* (Report to UNESCO of the International Commission on Education for the Twenty-first Century). Paris: UNESCO.
- Groundwater-Smith, S., Brennan, M., McFadden, M. & Mitchell, J. (2001). *Secondary schooling in a changing world*. Sydney: Harcourt Australia.
- Johnson, B. & Reid, A. (Eds.). (1999). *Contesting the curriculum*. Katoomba, NSW: Social Science Press.
- LoBianco, J. (1997). *Language and literacy: Australia's fundamental resource*. Canberra: AGPS.
- McRae, D. (1992). *Developing the VCE*. Geelong: Deakin University Press.
- Meadmore, D., Burnett, B. & O'Brien, P. (Eds.). (1999). *Understanding education: Contexts and agendas for the new millennium*. Sydney: Prentice-Hall.
- Reid, A. (Ed.). (1998). *Going public: Education policy and public education in Australia*. Deakin West, ACT: Australian Curriculum Studies Association.
- Smith, D.L. & Lovat, T.J. (1995). *Curriculum: Action on reflection* (3rd ed.). Wentworth Falls: Social Science Press.
- Symes, C. & Preston, N. (1997). *Schools and classrooms: A cultural studies analysis of education* (2nd ed.). South Melbourne: Longman.
- Welch, A. (1996). *Australian education: Reform or crisis?* St. Leonards, NSW: Allen & Unwin.
- White, R. & Gunstone, R. (1992). *Probing understanding*. London: The Falmer Press.
- Willis, S. & Kissane, G. (1997). *Achieving outcome-based education: Premises,*

*principles and implications for curriculum and assessment.* Deakin West, ACT:  
Australian Curriculum Studies Association.  
VCE Study Designs

### **Journals**

*Assessment in Education: Principles, Policy & Practice*  
*Curriculum Inquiry*  
*Curriculum Perspectives*  
*Discourse*  
*EQ Australia*  
*Journal of Curriculum Studies*  
*The Australian Educational Researcher*  
*Unicorn*  
*VCE Bulletin*

### **Websites and Electronic Sources**

<http://www.sofweb.vic.edu.au>  
[curriculum@work](#) (CD-ROM)  
[Switched on Assessment](#) (CD-ROM)

**UNIT CODE AND TITLE:** TT514 Assessment and the Promotion of Learning  
**AUTHOR:** Helen Hayes  
**SCHOOL:** Education  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** TT511 Learning and Teaching  
 TT512 Young People and Learning Environments  
 TT513 Design for Learning  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 15

**OBJECTIVES:**

This unit is designed to enable and encourage students to:

- examine the ways in which assessment can promote and support learning
- explore a range of modes of assessment
- analyse the impact of various forms of assessment (eg outcomes-based, competency-based) on the design of learning environments, on teaching-learning relationships and on student engagement with their learning
- distinguish between formative and summative forms of assessment
- become aware of the political aspects of assessment regimes
- design appropriate assessment tasks and strategies

**CONTENT:**

- reflection on the ways in which assessment practices have impacted on their learning
- ways in which assessment practices have been formed by beliefs about learning
- forms of assessment (eg outcomes/competency-based; formative; summative; norm-referenced; criterion-referenced)
- analysis of assessment tasks
- quantitative and qualitative aspects of assessment feedback
- design of assessment tasks
- negotiation and assessment
- political aspects of assessment regimes (eg selectivity, credentialing)
- relevant units from Certificate IV in Assessment and Workplace Learning (first three units: 35 hours)

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Reflection on the ways in which assessment practices have impacted on their learning	Narrative of a personal experience of assessment, with analysis of the meaning and implications of their experience	30%
Critical analysis of assessment tasks	Collection of 5 assessment tasks with critical commentary	30%
Design of assessment tasks	Set of 5 assessment tasks, with argument for their format, etc. (May be substituted for by three units in Cert IV Assessment and Workplace Learning)	40%

**REFERENCES:**

Forte, I. & Schurr, S. (1999). *A-Z authentic assessment*. Cheltenham, Vic: Hawker Brownlow Education.  
 Gipps, C.V. (1994). *Beyond testing: Towards a theory of educational assessment*. London: The Falmer Press.

- Goldstein, H. & Lewis, T. (Eds.). (1996). *Assessment problems, developments, and statistical issues: A volume of expert contributions*. New York : Wiley.
- White, R. & Gunstone, R. (1992). *Probing understanding*. London: The Falmer Press.
- Willis, S. & Kissane, B. (1997). *Achieving outcome-based education : Premises, principles and implications for curriculum and assessment*. Deakin West, ACT: Australian Curriculum Studies Association.

### **Journals**

*Assessment in Education: Principles, Policy and Practice*  
*Curriculum Perspectives*  
*EQ Australia*  
*VCE Bulletin*

### **Websites and Electronic Sources**

Relevant websites, databases and online journals.  
*Switched on Assessment* (CD-Rom)

<b>UNIT CODE AND TITLE:</b>	<b>TT515 Tools for Learning in Mathematics, Science and Technology</b>
<b>AUTHOR:</b>	<b>Lyn Roberts, Robyn Pierce, John Murray</b>
<b>SCHOOL:</b>	<b>Information Technology &amp; Mathematical Sciences</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

## **OBJECTIVES:**

### **Knowledge**

- identify basic pieces of scientific equipment used in laboratories.;
- retrieve important information and values from Material Safety Data Sheets and comment on the use of such data in establishing safety protocols in an industrial laboratory situation;
- calculate scientific values of relevance from tables and quote results with correct precision and units;
- appreciate the role of spectroscopy in the scientific disciplines;
- describe the operation of simple electric circuits;
- understand the basic hardware components of a computer system
- understand the role and know common usages of operating systems
- understand the concepts of file management
- present data in a clear and informative way in both tabular and graphical form;
- understand and present basic descriptive statistics;
- understand the need for clear and logical questions in survey design
- manipulate simple algebraic expressions;
- describe relations and functions and related ideas;
- understand where it is appropriate to choose verbal, numerical, symbolic or graphical presentation of scientific and mathematical concepts.

### **Skills**

- apply appropriate problem-solving and teamwork techniques;
- achieve acceptable standards in the appropriate use of scientific methods and laboratory techniques with regard to analysing and testing simple scientific systems;
- use information and communication technologies such as email, educational newsgroups and bulletin boards
- produce a simple, well designed web page
- give an oral presentation using presentation technology.
- use a graphical calculator or other technology to investigate the graphs of functions and relations
- use a spreadsheet package to produce appropriate graphs of data
- use a spreadsheet package to model data

### **Values and Attitudes**

- appreciate science as an aspect of the whole life of a community viewed from a particular standpoint of learning and recognize that as an educational instrument its function is one of conserving, transmitting and discovering scientific knowledge;
- assess critically the position of science within the world and appreciate the power of science to produce not only a kind of person but also a kind of society;
- appreciate the applications of information and communications technology in all areas of society, including aspects of education, recreation and the workplace;
- appreciate ethical behaviour in relation to science and technology, in particular issues relating to privacy, security, copyright and censorship;
- appreciate the positive value to society of the accurate and ethical use of statistics.

## CONTENT:

### Key Questions

- how do I use technology to analyse and present scientific and numerical information?
- what are the key scientific, technological and mathematical skills needed for the teaching profession?

### Topics

- Science: Units and Measurement, Significant Figures, Safety in the Laboratory, Basic Scientific Equipment, Electrical Circuitry, and Spectroscopy.
- Technology: communications technologies, use of spreadsheets, presentation technologies, graphical calculators.
- Mathematics: number sense, symbol sense, graph sense, formulae, functions, simple mathematical modeling.
- Statistics: descriptive statistics, tabular and graphical presentation of data, questionnaire design.

## LEARNING TASKS AND ASSESSMENT:

Learning Task	Assessment	Weighting
Participate in class activities	Portfolio of completed work	10-20%
Self directed or group exploration	Projects/presentation	30-60
Review and skills practice	Tests/examination	30-50

## TEACHING APPROACHES:

A combination of lectures, tutorials, practice classes, science and computer laboratory classes, group discussions, and self-directed learning.

## REFERENCES:

- Australian Bureau of Statistics. *An introduction to sample surveys: A user's guide*, Cat. No. 1202.2.
- Bertcher, H. J. (1994). *Group participation*. Thousand Oaks, California: Sage.
- Burdess, N. (1994). *The really understandable stats book*. Prentice Hall.
- Brown, Theodore L, LeMay, Eugene and Bursten & Bruce E. (2000). *Chemistry – The central science* (8th. ed.). NJ: Prentice Hall.
- Chapman, M. (1986). *Plain figures*. London, HMSO.
- Comer, D. (1997). *The internet book : everything you need to know about computer networking and how the Internet works*. Upper Saddle River, N.J. : Prentice-Hall.
- Foddy, W. (1993). *Constructing questions for interviews and questionnaires*. Melbourne, Cambridge University Press.
- Gorman, C. (ed.) (1994). *Working safely with chemicals in the laboratory* (2nd ed.). New York: Genium Publishing.
- MacGregor, S. (1994). *Students steps to success*. Lindfield, NSW: Southwood Press.
- Rabb, M. (1993). *The presentation design book* (2nd ed.). Venata Press.
- Rhoden, C. & Starkey, R. (1998). *Studying science at university – Everything you need to know*. Australia: Allen and Unwin.
- Petocz P., Petocz D. & Wood L. *Introductory mathematics*. Thomas Nelson, Australia. 1992.
- Saunders, D. (1994). *The complete student handbook*. Cambridge, MA: Blackwell Publishing.
- Snyder, Carl H. (1995). *The extraordinary chemistry of ordinary things* (2nd ed.). New York: Wiley.
- Trainor, T, N. & Krasnewich, D. (1996). *Computers* (5th ed.). McGraw-Hill.
- Tufte, E.R. (1983). *The visual display of quantitative information*. Cheshire: Graphics Press.

## Journals

*For the Learning of Mathematics*, Montreal: FLM Pub. Co.

*Science Teacher*, Washington; National Science Teachers Association.

*Teaching Statistics*, Sheffield: Teaching Statistics Trust.  
*The Mathematics Teacher*, Reston, Va. National Council of Teachers of  
Mathematics.  
*Vinculum*, Parkville, Vic, Mathematical Association of Victoria.

<b>UNIT CODE AND TITLE:</b>	<b>TT531 Materials and Processes</b>
<b>AUTHOR:</b>	<b>David Manterfield and Joy Nunn</b>
<b>SCHOOL:</b>	<b>Education and Manufacturing and Technology</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>TAFE NATIONAL CURRICULUM MODULE CODES AND TITLES*:</b>	<b>EA010 Materials Science EA740 Workshop Practices (Fabrication) EA741 Workshop Process Module (Machine Shop) EA804 Introductory Strength of Materials</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EQUIPMENT REQUIREMENTS:</b>	<b>Hand tools and measuring equipment</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15cps, 150 learning hours in a range of learning environments including workshop and industrial settings.</b>
<b>ADDITIONAL INFORMATION:</b>	<b>This unit is composed of modules from the TAFE National Curriculum. The learning outcomes, assessment criteria and assessment methods comply with the component National Curriculum Modules. Students enrolled in the BEd/BTech will achieve the learning outcomes in a range of learning environments including workshop and industrial settings.</b>

**OBJECTIVES:**

\*As described in the National Curriculum Modules.

**CONTENT:**

\*As described in the National Curriculum Modules.

Summary of topics:

(A summary of topics could be included as already prepared by David Manterfield)

**LEARNING TASKS AND ASSESSMENT:**

\* As described in the National Curriculum Modules.

**TEACHING APPROACHES:**

\* As described in the National Curriculum Modules.

**REFERENCES:**

\* As described in the National Curriculum Modules.

**Journals and websites**

\*As described in the National Curriculum Modules.

<b>UNIT CODE AND TITLE:</b>	<b>TT532 Wood Construction Technology</b>
<b>AUTHOR:</b>	<b>David Manterfield and Joy Nunn</b>
<b>SCHOOL:</b>	<b>Education and Manufacturing and Technology</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15cps, 150 learning hours in a range of learning environments including workshop and industrial settings.</b>
<b>ADDITIONAL INFORMATION:</b>	<b>This unit is composed of modules from the TAFE National Curriculum. The learning outcomes, assessment criteria and assessment methods comply with the component National Curriculum Modules. Students enrolled in the BEd/BTech will achieve the learning outcomes in a range of learning environments including workshop and industrial settings.</b>

**CONTENT:**

\*As described in the National Curriculum Modules.

Summary of topics:

(A summary of topics could be included as already prepared by David Manterfield)

**LEARNING TASKS AND ASSESSMENT:**

\* As described in the National Curriculum Modules.

**TEACHING APPROACHES:**

\* As described in the National Curriculum Modules.

**REFERENCES:**

\* As described in the National Curriculum Modules.

**Journals and websites**

\*As described in the National Curriculum Modules.

<b>UNIT CODE AND TITLE:</b>	<b>TT533 Plastics Fabrication Technology</b>
<b>AUTHOR:</b>	<b>David Manterfield and Joy Nunn</b>
<b>SCHOOL:</b>	<b>Education and Manufacturing and Technology</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15cps, 150 learning hours in a range of learning environments including workshop and industrial settings.</b>
<b>ADDITIONAL INFORMATION:</b>	<b>This unit is composed of modules from the TAFE National Curriculum. The learning outcomes, assessment criteria and assessment methods comply with the component National Curriculum Modules. Students enrolled in the BEd/BTech will achieve the learning outcomes in a range of learning environments including workshop and industrial settings.</b>

**CONTENT:**

\*As described in the National Curriculum Modules.

Summary of topics:

(A summary of topics could be included as already prepared by David Manterfield)

**LEARNING TASKS AND ASSESSMENT:**

\* As described in the National Curriculum Modules.

**TEACHING APPROACHES:**

\* As described in the National Curriculum Modules.

**REFERENCES:**

\* As described in the National Curriculum Modules.

**Journals and websites**

\*As described in the National Curriculum Modules.

<b>UNIT CODE AND TITLE:</b>	<b>TT534 Electronics and Control Systems</b>
<b>AUTHOR:</b>	<b>David Manterfield and Joy Nunn</b>
<b>SCHOOL:</b>	<b>Education and Manufacturing and Technology</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15cps, 150 learning hours in a range of learning environments including workshop and industrial settings.</b>
<b>ADDITIONAL INFORMATION:</b>	<b>This unit is composed of modules from the TAFE National Curriculum. The learning outcomes, assessment criteria and assessment methods comply with the component National Curriculum Modules. Students enrolled in the BEd/BTech will achieve the learning outcomes in a range of learning environments including workshop and industrial settings.</b>

**CONTENT:**

\*As described in the National Curriculum Modules.

Summary of topics:

(A summary of topics could be included as already prepared by David Manterfield)

**LEARNING TASKS AND ASSESSMENT:**

\* As described in the National Curriculum Modules.

**TEACHING APPROACHES:**

\* As described in the National Curriculum Modules.

**REFERENCES:**

\* As described in the National Curriculum Modules.

**Journals and websites**

\*As described in the National Curriculum Modules.

<b>UNIT CODE AND TITLE:</b>	<b>TT535 Engineering Graphics and Design Principles</b>
<b>AUTHOR:</b>	<b>David Manterfield and Joy Nunn</b>
<b>SCHOOL:</b>	<b>Education and Manufacturing and Technology</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15cps, 150 learning hours in a range of learning environments including workshop and industrial settings.</b>
<b>ADDITIONAL INFORMATION:</b>	<b>This unit is composed of modules from the TAFE National Curriculum. The learning outcomes, assessment criteria and assessment methods comply with the component National Curriculum Modules. Students enrolled in the BEd/BTech will achieve the learning outcomes in a range of learning environments including workshop and industrial settings.</b>

**CONTENT:**

\*As described in the National Curriculum Modules.

Summary of topics:

(A summary of topics could be included as already prepared by David Manterfield)

**LEARNING TASKS AND ASSESSMENT:**

\* As described in the National Curriculum Modules.

**TEACHING APPROACHES:**

\* As described in the National Curriculum Modules.

**REFERENCES:**

\* As described in the National Curriculum Modules.

**Journals and websites**

\*As described in the National Curriculum Modules.

<b>UNIT CODE AND TITLE:</b>	<b>TT536 Technology Design and Development</b>
<b>AUTHOR:</b>	<b>David Manterfield and Joy Nunn</b>
<b>SCHOOL:</b>	<b>Education and Manufacturing and Technology</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15cps, 150 learning hours in a range of learning environments including workshop and industrial settings.</b>
<b>ADDITIONAL INFORMATION:</b>	<b>This unit is composed of modules from the TAFE National Curriculum. The learning outcomes, assessment criteria and assessment methods comply with the component National Curriculum Modules. Students enrolled in the BEd/BTech will achieve the learning outcomes in a range of learning environments including workshop and industrial settings.</b>

**CONTENT:**

\*As described in the National Curriculum Modules.

Summary of topics:

(A summary of topics could be included as already prepared by David Manterfield)

**LEARNING TASKS AND ASSESSMENT:**

\* As described in the National Curriculum Modules.

**TEACHING APPROACHES:**

\* As described in the National Curriculum Modules.

**REFERENCES:**

\* As described in the National Curriculum Modules.

**Journals and websites**

\*As described in the National Curriculum Modules.

<b>UNIT CODE AND TITLE:</b>	<b>TT611 Mathematics Curriculum</b>
<b>AUTHOR:</b>	<b>Fran Hanrahan</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Two semesters of discipline studies</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

**OBJECTIVES:**

This unit is designed to enable students to:

- identify important trends and developments in Australian mathematics education;
- discuss a range of methods and approaches which will produce effective teaching and learning of mathematics in formal learning settings;
- implement problem solving and modelling activities in mathematics;
- work confidently with the Curriculum and Standards Frameworks (CSFII) and VCE Study Design, Mathematics;
- familiarise themselves with the use of technology such as calculators and computers in mathematics teaching and learning;
- describe and use other important resources in mathematics education such as mathematics journals, textbooks, special teaching aids;
- show an awareness of National Literacy and Numeracy issues.
- show an awareness of language, ethnic and gender issues in mathematics learning;
- display an awareness of the activities of professional associations in mathematics education.

**CONTENT:**

- The nature of mathematics and the reasons for teaching it.
- Approaches to teaching and learning mathematics – a constructivist perspective.
- Problem solving: a universal theme in mathematics.
- Planning, using the CSFII Mathematics document and the VCE Study Design, Mathematics.
- Important resources including technology, for mathematics teaching and learning.
- The teaching of geometry, number, measurement.
- Assessment alternatives in mathematics such as in VCE mathematics units.
- Gender and culture in mathematics education.
- The professional associations and publications in Australia and overseas.

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Review of mathematics education articles	Short written reviews of articles	Negotiable 10-30%
Discussion of mathematics teaching and learning approaches	Presentations	Negotiable 20-30%
Study of the CSF and VCE Study Design document	Plan of a unit of work	Negotiable 30-50%
Investigation of technology and other resources for mathematics	Production and/or evaluation of teaching materials	Negotiable 20-40%

## TEACHING APPROACHES:

Lectures, workshops, modelling of teaching practices, readings and class discussions, individual presentations, visiting speakers and investigations of learning processes.

## REFERENCES:

### Books

- Abdelnoor, R. (1988). *Dominie mathematical dictionary*. Brookvale, NSW: Arnold Wheaton.
- Board of Studies. (2000). *Mathematics: Curriculum & standards framework II*. Carlton, VIC: Author.
- Board of Studies. (2000). *VCE Study design: Mathematics*. Carlton, VIC: Author.
- Bobis, J., Mulligan, J., Lowrie, T., & Taplin, M. (1999). *Mathematics for children: Challenging children to think mathematically*. Erskineville, NSW: Prentice Hall.
- Grimison, L. & Pegg, J. (1995). *Teaching secondary school mathematics: Theory into practice*. Marrickville, NSW: Harcourt Brace.
- Lovitt, C., & Clarke, D. (1988). *The mathematics curriculum and teaching program: Activity bank, volumes 1 & 2*. Melbourne: Curriculum Corporation.
- Nolan, J., Phillips, G., Watson, J., Denny, C. & Stambulic, S. (2000). *Maths quest 12: Mathematics methods VCE mathematics units 3 & 4*. Brisbane: John Wiley and Sons.
- Perry, B., & Conroy, J. (1994). *Early childhood and primary mathematics: A participative text for teachers*. Marrickville, NSW: Harcourt Brace.

### List of Websites

VCAA (Victoria)	<a href="http://www.vcaa.vic.edu.au">www.vcaa.vic.edu.au</a>
Curriculum Corporation	<a href="http://www.curriculum.edu.au">www.curriculum.edu.au</a>
Department of Education, Employment and Training	<a href="http://www.sofweb.vic.edu.au">www.sofweb.vic.edu.au</a>
Education Network Australia	<a href="http://www.edna.edu.au">www.edna.edu.au</a>
Mathematics Association of Victoria	<a href="http://www.mav.vic.edu.au">www.mav.vic.edu.au</a>
National Council of Teachers of Mathematics (USA)	<a href="http://www.nctm.org">www.nctm.org</a>

### Journals, Magazines, Bulletins and Newsletters

*The Australian Mathematics Teacher*  
*EQ Australia (Quarterly magazine of the Curriculum Corporation)*  
*Journal for Research in Mathematics Education*  
*Mathematics Teacher (NCTM)*  
*Mathematics Teaching in the Middle School (NCTM)*  
*Newsletter - VCAA. (Information about P-10 Curriculum, Learning Assessment Profiles)*  
*Teaching Children Mathematics*  
*VCE Bulletin*  
*Vinculum (MAV)*

<b>UNIT CODE AND TITLE:</b>	<b>TT612 Science Curriculum</b>
<b>AUTHOR:</b>	<b>Garry Henderson</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

### **OBJECTIVES:**

This science curriculum unit is designed to enable students to:

- critically consider different models of learning and teaching, including those based on learning technologies, the value assumptions underlying them, and to relate these to their own teaching of science;
- identify, evaluate and develop particular teaching skills and strategies, including the use of learning technologies, needed to create optimum science learning conditions in a range of learning environments;
- understand different forms of assessment and their underlying philosophies, and apply these in a practical science learning situation;
- develop the ability to plan and construct teaching units which address the requirements of CSF and the Victorian Certificate of Education, current scientific understandings, the links between science, technology and society, and students' diverse backgrounds, abilities and needs;
- demonstrate an appreciation of the nature of science as a constantly developing field of knowledge and understanding, the processes of science which support this development, and the ethical issues raised by scientific endeavours;
- display an interest leading to the desire to increase knowledge of the scientific understandings and developments which impact on our lives;
- develop competence in literacy, particularly as it pertains to scientific discussion and discourse.

### **CONTENT:**

The unit content includes the following:

- science as a field of human knowledge and endeavour, the links between science and other areas of knowledge and between the traditional science disciplines;
- specific teaching and learning strategies in years 7 to 12 science: including constructivist learning, practical work, safety issues, discovery learning, excursions and critical evaluation of these;
- science teaching – learning sequence planning, implementation, evaluation and reflection;
- curriculum design and the preparation of units of work for science teaching;
- design of assessment tasks and formats for science teaching and learning;
- planning, implementing and reporting as required by the curriculum guidelines in CSFII and relevant VCE Study Designs.

## LEARNING TASKS AND ASSESSMENT:

Learning Task	Assessment	Weighting
Demonstration and teaching sequence, and preparation of a teaching guide for class members.	Class presentation. One third of this will be peer assessed	30%
Selection and rationale for appropriate assessment tasks in a VCE Study Design.	Written report and sample assessment tasks	30%
Preparation of a unit of science learning, including an assessment plan, informed by constructivist learning theory.	Unit of science learning for CSFII 7-10 or VCE	40%

## REFERENCES:

- Board of Studies. (2000). *Curriculum and standards framework II*. Carlton, VIC: Author.
- Dawson, C. (1991). *Beginning science teaching*. Melbourne: Longman-Cheshire.
- Friedl, A.E. (1986). *Teaching science to children*. New York: Random House.
- Osborne, R. & Freyberg, P. (1985). *Learning in science*. Auckland, NZ: Heinemann.

## Journals

- Lab Talk*.
- Australian Science Teachers' Journal*.
- Research in Science Education*.
- Journal of Research in Science Teaching*.

## Websites

- [www.sofweb.vic.edu.au/science](http://www.sofweb.vic.edu.au/science)
- [www.bom.gov.au/lam/Students\\_Teachers/learnact.htm](http://www.bom.gov.au/lam/Students_Teachers/learnact.htm)
- [www.cellsalive.com](http://www.cellsalive.com)
- [www.nasa.gov](http://www.nasa.gov)
- [www.howstuffworks.lycos.com](http://www.howstuffworks.lycos.com)

**UNIT CODE AND TITLE:** TT613 Technology Curriculum  
**AUTHOR:** Joy Nunn and Gary Allen  
**SCHOOL:** Education  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 15

**OBJECTIVES:**

This technology curriculum unit is designed to enable students to:

- evaluate their own role and practice, in relation to changes in technology, education and society;
- plan and construct 7-12 teaching units which address current materials and systems technology understandings, the links between technology and society, students' diverse backgrounds, abilities and needs;
- develop competency in peer and independent teaching of materials and systems technology using a variety of strategies and resources incorporating learning technologies;
- understand different forms of assessment required by the Curriculum and Standards Framework II and the VCE Study Guide: Materials and Systems Technology, and their underlying philosophies, and apply these in a range of practical learning situations;
- develop and demonstrate the competencies necessary for successful facilitation of technology learning.

**CONTENT:**

- technology as a field of human knowledge and endeavour, the links between technology and other areas of knowledge and between the traditional technology areas.
- further development and critical evaluation of teaching strategies in relation to constructivist theory and the achievement of purposeful learning by students;
- learning theories and practical teaching;
- curriculum design and the preparation of units of work;
- evaluation and assessment issues;
- planning, implementing and reporting as required by the curriculum guidelines in the CSFII and the VCE Study Design.

**LEARNING TASKS AND ASSESSMENT:**

Learning Tasks	Assessment	Weighting
Synthesis of activities used or observed in a formal learning environment and preparation of a written contribution to a class resource folder.	Class presentation	20%

Learning Tasks	Assessment	Weighting
Preparation of a sequence of learning based on constructivist theory and the CSF/VCE. The unit should address the development of process skills, understanding of appropriate technology concepts, and relationships with technology and social issues.	Curriculum document detailing all aspects for the implementation, assessment and evaluation of the sequence of learning.	45%
Preparation of a detailed assessment plan based on the sequence of learning.	Assessment plan	35%

#### **TEACHING APPROACHES:**

- Lectures and tutorials that will aim at maximum student participation by including student presentations and teaching sequences using a variety of traditional and technological approaches.
- Group and individual research and discussion sessions where curriculum issues are addressed and teaching sequences planned.
- An excursion which links issues of CSF and VCE curriculum, planning, implementation and assessment.

#### **REFERENCES:**

*To be developed with the assistance of the Technology Teachers Association.*

**UNIT CODE AND TITLE:** TT614 VET\* Curriculum  
**AUTHOR:** Joy Nunn and Gary Allen  
**SCHOOL:** Education  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** ...  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 15

\* This unit will be developed fully during 2002 when the Department of Education, Employment and Training publishes the guidelines for the teaching of Vocational Educational and Training (VET) in secondary schools.

**OBJECTIVES:**

This VET curriculum unit is designed to enable students to:

- evaluate their own role and practice, in relation to changes in VET, education and society;
- plan and construct 7-12 teaching units which address current VET understandings, the links between society, students' diverse backgrounds, abilities and needs;
- develop competency in peer and independent teaching of VET using a variety of strategies and resources incorporating learning technologies;
- understand different forms of assessment required by the Curriculum and Standards Framework II and the relevant VCE Study Guide and their underlying philosophies, and apply these in a range of practical learning situations;
- develop and demonstrate the competencies necessary for successful facilitation of learning in areas of Vocational Education and Training.

**CONTENT:**

- VET as a field of human knowledge and endeavour, the links between technology and other areas of knowledge and between the traditional learning areas.
- further development and critical evaluation of teaching strategies in relation to learning theory and the achievement of purposeful learning by students;
- learning theories and practical teaching;
- curriculum design and the preparation of units of work;
- evaluation and assessment issues;
- planning, implementing and reporting as required by the curriculum guidelines in the CSFII, National Curriculum Modules and the VCE Study Design.

**LEARNING TASKS AND ASSESSMENT:**

Learning Tasks	Assessment	Weighting
Synthesis of activities used or observed in a formal learning environment and preparation of a written contribution to a class resource folder.	Class presentation	20%

Learning Tasks	Assessment	Weighting
Preparation of a sequence of learning based on the National Curriculum Modules/CSF/VCE. The unit should address the development of process skills, understanding of appropriate technology concepts, and relationships with technology and social issues.	Curriculum document detailing all aspects for the implementation, assessment and evaluation of the sequence of learning.	45%
Preparation of a detailed assessment plan based on the sequence of learning.	Assessment plan	35%

**TEACHING APPROACHES:**

- Lectures and tutorials that will aim at maximum student participation by including student presentations and teaching sequences using a variety of traditional and technological approaches.
- Group and individual research and discussion sessions where curriculum issues are addressed and teaching sequences planned.
- An excursion which links issues of the National TAFE Curriculum, CSFII and VCE curriculum, planning, implementation and assessment.

**REFERENCES:**

*To be developed with the assistance of the Technology Teachers Association.*

<b>UNIT CODE AND TITLE:</b>	<b>TT815 Collaborative Research and Evaluation</b>
<b>AUTHOR:</b>	<b>Helen Hayes</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Education units and Practicum Experience</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

**OBJECTIVES:**

This unit is designed to enable and encourage students to:

- identify and define significant educational issues based on their experiences in learning environments
- develop processes of analysis to apply to discussion and evaluation of the issues
- consult and critique the literature relevant to the issues
- select appropriate research methodology to apply to exploration of the issues
- conduct group research into a selected issue
- communicate research/evaluation findings in written and oral formats
- value collaboration among research partners
- appreciate the participatory nature of educational research/evaluation
- display ethical practice in the conduct of inquiry

**CONTENT:**

The unit will involve students in identifying a range of significant issues in the intersecting fields of education, technology and enterprise, and in selecting a focus for a small group research project. Content of the unit will therefore comprise:

- ways of ‘framing’ issues theoretically, culturally and politically
- techniques of critical analysis relevant to selected issues
- research methodologies (eg. qualitative, quantitative, ethnography, action research)
- research techniques (ways of gathering and analysing data)
- ways of making meaning of data (and the ways purpose, background and culture influence these)
- ethical issues in doing research

**LEARNING AND ASSESSMENT TASKS:**

Learning Task	Assessment	Weighting
Designing a research/evaluation project (in small groups)	Research proposal	20%
Carrying out a research project (in small groups)	Research report	50%
Communicating research findings	Oral presentation of research findings	30%

**REFERENCES:**

**Educational Issues**

- Bentley, T. (1998). *Learning beyond the classroom: Education for a changing world*. London: Routledge.
- Cope, B. & Kalantzis, M. (Eds.). (2000). *Multiliteracies: Literacy learning and the design of social futures*. South Yarra, VIC: Macmillan Publishers.
- Gee, J. P., Hull, G. & Lankshear, C. (1996). *The new work order: Behind the language of new capitalism*. St. Leonards, NSW: Allen & Unwin.
- Johnson, B. & Reid, A. (Eds.). (1999). *Contesting the curriculum*. Katoomba, NSW: Social Science Press.
- Meadmore, D., Burnett, B. & O'Brien, P. (Eds.). (1999). *Understanding education:*

*Contexts and agendas for the new millennium.* Sydney: Prentice-Hall.

### **Research Methodology**

Delamont, S. (1992). *Fieldwork in educational settings: Methods, pitfalls and perspectives.* London: The Falmer Press.

Denzin, N. K. & Lincoln, Y. S (Eds.). (2000). *Handbook of qualitative research* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Knobel, M. & Lankshear, C. (1999). *Ways of knowing: Researching literacy.* Newtown, NSW: Primary English Teaching Association.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage Publications.

### **Journals**

*The Australian Educational Researcher*  
*set: Research Information for Teachers*

### **Electronic Sources**

Relevant websites, databases, and online journals

<b>UNIT CODE AND TITLE:</b>	<b>TT816 Global Perspectives on Education, Technology and Enterprise</b>
<b>AUTHOR:</b>	<b>Helen Hayes</b>
<b>SCHOOL:</b>	<b>Education</b>
<b>COURSE:</b>	<b>Bachelor of Education/Bachelor of Technology</b>
<b>PREREQUISITE(S):</b>	<b>Education units and Practicum Experience</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>CREDIT POINTS:</b>	<b>15</b>

### OBJECTIVES:

The unit is designed to enable students to:

- develop a critical understanding of the social, political and economic context within which contemporary formal education operates, and an appreciation of the global dimensions of that environment
- identify the needs and interests which have shaped moves to restructure education in local, state, national and international contexts
- understand the forces that lead to restructuring in systems or that work against change
- distinguish the various authorities that define formal education at state and national level in Australia
- become familiar with the instruments used to compare educational systems (eg IEA programs, TIMSS data) and some of their findings
- consider the global aspirations expressed in documents prepared by international bodies such as UNESCO and OECD
- engage critically with 'futures' literature as it relates to education, technology and enterprise

### CONTENT:

- structure of education systems in Victoria and Australia
- impact of government policies regarding technology and enterprise on the structure and curriculum of formal education environments
- forces for and against change in educational systems
- international competitiveness and its effect on the structure and curriculum of formal educational environments
- international comparative data on student learning, for example in mathematics and science (TIMSS)
- international educational priorities as articulated by such bodies as UNESCO and OECD
- literature on social, economic and educational futures

### LEARNING TASKS AND ASSESSMENT:

Learning Task	Assessment	Weighting
Analysis of relevant curriculum policy document	Diagram/concept map of policy document, indicating influences	35%
Extrapolation of curriculum futures	Design of alternative curriculum and/or organisational structures	40%
Shared reading and discussion (reading circles)	Folio of 5 articles with commentary	25%

### REFERENCES:

- Beare, H. (1997). *Designing a break-the-mould school for the future*. Hawthorn: ACEA Virtual Conference.  
<http://www.eddirect.com...c/aceavirt/beare.html>
- Caldwell, B. & Spinks, J. (1998). *Beyond the self-managing school*. London: The Falmer Press.

- Cope, B. & Kalantzis, M. (1998). *Productive diversity: A new Australian model for work and management*. Annandale: Pluto Press.
- Delors, J. (Chair). (1996). *Learning: The treasure within* (Report to UNESCO of the International Commission on Education for the Twenty-first Century). Paris: UNESCO.
- Ellyard, P. (1998). *Ideas for the new millennium*. Carlton South: Melbourne University Press.
- Fullan, M. (1993). *Change forces: Probing the depths of education reform*. London: The Falmer Press.
- Gee, J. P., Hull, G. & Lankshear, C. (1996). *The new work order: Behind the language of new capitalism*. St. Leonards, NSW: Allen & Unwin.
- Marginson, S. (1993). *Education and public policy in Australia*. Cambridge: Cambridge University Press.
- State of Victoria. (2000). *Ministerial review of post compulsory education and training pathways in Victoria: Final report* (P. Kirby, Chair). Melbourne: Department of Education, Employment and Training.
- Symes, C. & Preston, N. (1997). *Schools and classrooms: A cultural studies analysis of education* (2nd ed.). Melbourne: Longman Cheshire.
- Welch, A. (1996). *Australian education: Reform or crisis?* St. Leonards, NSW: Allen & Unwin.

### **Policy Documents**

Curriculum & Standards Framework II  
 Victorian Certificate of Education Study Designs  
 Relevant TAFE curriculum policy documents

### **Electronic Sources**

Relevant websites, databases and online journals

**UNIT CODE AND TITLE:** TX620 Teaching Experiences and Professional Practice Seminar 1  
**AUTHOR:** Maryann Brown  
**SCHOOL:** Education  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** Education units  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 60

**OBJECTIVES:**

This unit is designed to enable students to:

- contextualise and integrate their knowledge and skills considered within the Bachelor of Education/Bachelor of Technology in order to provide a strong basis for their ongoing professional development;
- practise teaching and receive feedback regarding their teaching performance;
- reflect upon their learning at university and in schools and upon their own teaching practice;
- bring insights from their school-based experiences to their University of Ballarat studies;
- become educators who inquire into professional practice;
- gain an understanding of the depth, complexity and constraints of secondary school environments through researching in a school setting, through teaching and reflecting on their learning;
- articulate and explore questions that arise from their observations, reading, research and practice;
- be supported in their engagement with schools and other learning communities.

**CONTENT:**

- Preparing to teach – analysis and development of qualities needed for effective teaching .
- Developing communication skills and positive relationships in teaching.
- Personal agency and personal needs analysis – to form basis of personal goal setting for unit.
- Developing and trialing student management strategies.
- Developing professional organisational and information management approaches.
- Recognising and studying occupational health and safety issues in school settings.

**LEARNING TASKS AND ASSESSMENTS:**

Learning Task	Assessment	Weighting
Occupational health and safety module NBB02	Written report	10%
Teaching experience – 60 days (approx.) in school	Practical experience assessed by school based mentor	90%
Becoming a teacher	Professional portfolio in progress	S/N

**TEACHING APPROACHES:**

Practical teaching experience (60 days)  
 Seminar series and workshops  
 Self-paced online and/or distance learning  
 Discussion groups  
 Research, inquiry and reading

## REFERENCES:

- Barry, K. & King, L. (1998). *Beginning teaching* (2<sup>nd</sup> ed.). Wentworth Falls: Social Science Press.
- Cole, A. & Knowles, J. (2000). *Researching teaching: Exploring teacher development through reflexive inquiry*. Needham Heights, MA: Allyn & Bacon.
- Cole, P. & Chan, L. (1998). *Teaching principles and practice* (2<sup>nd</sup> ed.). Sydney: Prentice Hall.
- Groundwater- Smith, S., Brennan, M., McFadden, M. & Mitchell, J. (2001). *Secondary schooling in a changing world*. Marrickville: Harcourt Australia.
- Loughran, J. (Ed). (1999). *Researching teaching: Methodologies and practices for understanding pedagogies*. London: Falmer Press.
- Marsh, C. (2000). *Handbook for beginning teachers* (2<sup>nd</sup> ed.). Frenchs Forest: Pearson Education Australia
- Mc Burney-Fry, G. (2001). *Improving your practicum: A guide to better teaching practice* (2<sup>nd</sup> ed.). Katoomba: Social Science Press.
- Posner, G. (1996). *Field experience: Methods of reflective teaching* (4<sup>th</sup> ed.). New York: Longman
- Richardson, V. (Ed). (1997). *Constructivist teacher education: Building a world of new understandings*. London: Falmer Press.

## Websites

- Key Victorian Education site – <http://www.sofweb.vic.edu.au>
- Education Network Australia – <http://www.edna.edu.au>
- Ministry Advisory Committee for the Victorian Institute of Teaching (MACVIT) – <http://sofweb.vic.edu.au/macvit>
- What to expect in your first year of teaching – <http://www.ed.gov/pubs/FirstYear/>

**UNIT CODE AND TITLE:** TX820 Teaching Experience 2 and Team Enterprise Project  
**AUTHOR:** Maryann Brown  
**SCHOOL:** Education  
**COURSE:** Bachelor of Education/Bachelor of Technology  
**PREREQUISITE(S):** Education and Discipline units, TX620  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**CREDIT POINTS:** 60

**OBJECTIVES:**

This unit is designed to enable students to:

- build on their learning from TX620 and to further enquire into Professional Issues;
- discuss and explore knowledge and skills acquisition in relation to the professional practice of teachers;
- develop their teaching skills through a 16-week teaching experience;
- accept responsibility for monitoring their own progress and responding to areas of need, in preparation for operating as a professional teacher within the secondary school setting;
- reflect on their own teaching and set professional development goals for the future;
- explore the origins of their beliefs about teaching and to encourage the development of a personal philosophy of teaching.
- work as a team member on an enterprise project in collaboration with education, industry and other relevant stakeholders.

**CONTENT:**

As for TX 620 and in addition:

- reporting and administrative responsibilities and functions of a teacher;
- research into experiences from previous teaching experiences;
- communication skills and relationship building in teaching;
- professional responsibilities and legal liability;
- professional support for teachers – unions, professional associations and others.

**LEARNING TASKS AND ASSESSMENT:**

Learning Task	Assessment	Weighting
Preparation for professional practice and enterprise project.	Engagement in seminars and personal learning as evidenced in final Professional Portfolio	S/N
Teaching Practicum Experience	Participate in 60-day teaching round. Assessed by school-based mentor.	70%
Participation in team enterprise project	Report on collaborative enterprise planning and development processes	30%

**METHODOLOGY:**

- 60 days practical experiences in schools
- Non-teaching school based research times
- Seminars and workshops – discussions, lectures, reading groups, guest speakers
- Use of Information Learning Technologies to produce web page and hard copy Professional Portfolio.

**REFERENCES:**

*As for TX 620 plus:*

- Adey, K. (Ed). (1998). *Preparing a profession: National standards and guidelines for initial teacher education*. Canberra: Australian Council of Deans of Education.
- Beattie, M. (1995). *Constructing professional knowledge in teaching: A narrative of change and development*. New York: Teachers College Press.
- Bentley, T. (1998). *Learning beyond the classroom: Education for a changing world*. London: Routledge.
- Kennedy, K. & Preston, B. (1996). *Teaching competencies and teacher education courses*. Sydney: Australian Teaching Council.
- Standards Council of the Teaching Profession. (1999). *Guidelines for the evaluation of teacher education courses*. Melbourne: Community Education Service SCTP.

**Websites**

- Sofweb Professional Development – <http://www.sofweb.vic.edu.au/pd>
- Australian National Schools Network – <http://www.nsn.net.au>
- Victorian Curriculum and Assessment Authority – <http://www.vcaa.edu.au>

## Appendix D: Handbook Entries

<b>UNIT CODE AND TITLE:</b>	<b>BS530 Technology in Society Seminar</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

### **CONTENT:**

This unit deals with the development and interaction of science, technology and industry. The aim of the unit is to place technology in an institutional, economic and social context, and to emphasise the importance of evolution and feedback.

<b>UNIT CODE AND TITLE:</b>	<b>BS636 Innovation and New Venture Creation</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

### **CONTENT:**

This unit will allow students to study the factors which determine the development and processes of technology entrepreneurship and its role in society. Through an understanding of technology opportunities the student should be better able to recognise the critical strategic imperatives for the development of new technology based enterprises and the rejuvenation of existing organisations.

<b>UNIT CODE AND TITLE:</b>	<b>BS637 Innovation and Technological Change</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

### **CONTENT:**

This unit addresses the critical issues which influence the sources of invention and innovation. A number of models are examined and the unit tries to incorporate these into a practical model of firm organisation behaviour and strategy.

<b>UNIT CODE AND TITLE:</b>	<b>BS730 Technology Commercialisation</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>BS637 Innovation and Technological Change</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

**CONTENT:**

This unit will show students how to evaluate the factors which facilitate the commercialisation of new technology. Specific issues of intellectual property protection, complementary assets, finance and logistics are dealt with in detail.

<b>UNIT CODE AND TITLE:</b>	<b>TT511 Introduction to Learning and Teaching</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

**CONTENT:**

This unit will focus on educators as inquirers into professional practice. Through processes of observation, planning, organising, monitoring and evaluating a range of teaching/learning approaches the students will investigate the complex nature of teaching and learning. Students will also examine, and critique, the value assumptions which impact on current school contexts, developing and expressing a view of themselves as researchers and reflective practitioners. Understanding the learning needs of all students and responding to these will be the key focus.

<b>UNIT CODE AND TITLE:</b>	<b>TT512 Young People and Learning Environments</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>Nil</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

**CONTENT:**

The unit is designed to enable students to develop insights into the tasks and problems experienced by adolescents and the impact of their experience on the ways in which they negotiate the school environment. A particular focus will be on those aspects of the teacher-student relationship which pertain to group management, attention to individuals and communication with parents.

<b>UNIT CODE AND TITLE:</b>	<b>TT513 Designing for Learning</b>
<b>CREDIT POINTS:</b>	<b>15</b>
<b>PREREQUISITE(S):</b>	<b>TT511 Introduction to Learning and Teaching</b>
<b>COREQUISITE(S):</b>	<b>Nil</b>
<b>EXCLUSION(S):</b>	<b>Nil</b>
<b>DURATION:</b>	<b>One Semester</b>
<b>OFFERED:</b>	<b>Semester 1 or 2</b>

**CONTENT:**

This unit explores key aspects of the nature of the school curriculum. Starting from the perspective of the individual teacher, issues relating to the classroom, the school, the education system and society at large are critically examined. Flexible, negotiated participation is a feature of the unit. Direct involvement with schools is encouraged. Where students have an interest in the role of curricula in workplaces/industries other than schools/the education industry, unit processes will be negotiated accordingly.

**UNIT CODE AND TITLE:** TT514 Assessment and the Promotion for Learning  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** TT511 Learning and Teaching  
 TT512 Young People and Learning Environments  
 TT513 Design for Learning  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit will involve students in reflecting on the ways in which assessment impacts on learning and incorporates beliefs about learning. Different forms of assessment will be analysed, and students will design and critique a variety of assessment tasks. For some students, three units from Certificate IV Assessment and Workplace Training may be available.

**UNIT CODE AND TITLE:** TT515 Tools for Learning in Mathematics, Science and Technology  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1

**CONTENT:**

This unit is designed to provide core skills in Information and Communications Technologies, Science, Mathematics and Statistics for prospective VET, Science and Technology teachers. Content includes: units and measurement, electrical circuitry, and spectroscopy, communications technologies, use of spreadsheets, presentation technologies, graphical calculators, number sense, symbol sense, graph sense, formulae, functions, simple mathematical modelling, descriptive statistics, tabular and graphical presentation of data, questionnaire design.

**UNIT CODE AND TITLE:** TT531 Materials and Processes  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit will enable students to recognise and classify common materials, identifying their properties and stress factors, and to develop skills of basic fabrication and machining.

**UNIT CODE AND TITLE:** TT532 Wood Construction Technology  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil

**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit is designed to enable students to develop the knowledge and skills to identify appropriate materials (eg timbers, fasteners, adhesives, surface coatings) and tools, and to use these materials and tools safely and correctly to manufacture and assemble basic furniture.

**UNIT CODE AND TITLE:** TT533 Plastics Fabrication Technology  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit is designed to enable students to design and detail plastics products, and to identify the equipment, processes, materials and end product so that work procedures and quality requirements can be met. Students will also develop skills in the use of specialised equipment for mechanical cutting and joining of materials.

**UNIT CODE AND TITLE:** TT534 Electronics and Control Systems  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit will introduce students to basic electrical and electronic principles, and enable them to develop the knowledge and ability to read diagrams, to use testing equipment and to design, install and fault-find circuits.

**UNIT CODE AND TITLE:** TT535 Engineering Graphics and Design Principles  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit is designed to enable students to become familiar with drafting media and orthographic projection, to understand different drawing types and design principles, and to engage in modelling and in design innovation.

**UNIT CODE AND TITLE:** TT536 Technology Design and Development

**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit is designed to enable students to develop understanding of design processes, to become familiar with mechanical systems of various types, and to engage in CAD operations and modelling.

**UNIT CODE AND TITLE:** TT611 Mathematics Curriculum  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit prepares students to teach in secondary schools with the major emphasis being on Years 7 to 12. It includes the nature and aims of mathematics education and will focus on recent developments in schools. A constructivist perspective on learning will be encouraged and issues of gender, culture, literacy and numeracy considered.

**UNIT CODE AND TITLE:** TT612 Science Curriculum  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit will enable students to develop competence in teaching science at secondary level. Within the theme of making science relevant and interesting for all students it links science and language, aims for an understanding of curriculum issues and curriculum planning skills, and for a knowledge of assessment issues and strategies.

**UNIT CODE AND TITLE:** TT613 Technology Curriculum  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit is designed to enable students to develop the skills and knowledge required for effective technology teaching. They will consider technology as a field of human knowledge and endeavour, and design learning and assessment experiences for students according to current curriculum policy and guidelines.

**UNIT CODE AND TITLE:** TT614 VET Curriculum  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit is designed to enable students to develop the skills and knowledge required for effective VET teaching. They will consider the range of students' needs and design learning and assessment experiences to meet such needs, according to current curriculum policy and guidelines.

**UNIT CODE AND TITLE:** TT815 Collaborative Research and Evaluation  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit will involve students in identifying a significant contemporary educational issue and conducting a small group research project. Content of the unit will therefore comprise an introduction to techniques of critical analysis, research and evaluation, practice in critiquing current reporting of educational issues, and the processes of doing research/evaluation and reporting findings.

**UNIT CODE AND TITLE:** TT816 Global Perspectives on Education, Technology and Enterprise  
**CREDIT POINTS:** 15  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit will engage students in critical analysis of local, national and international structures and policies with regard to education, technology and enterprise, assessing how these impact on the curriculum and organisation of formal education environments. Some attention will be given to the findings of international testing programs, and to the literature on social, economic and education futures.

**UNIT CODE AND TITLE:** TX620 Teaching Experience and Professional Practice Seminar 1  
**CREDIT POINTS:** 60  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil

**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit has two key components. The first is the Professional Practice Seminars, which have a focus on 'Preparing to Teach'. School visits will provide the opportunity to observe and inquire into professional practice. The second part of the unit is the supervised teaching experience where students will spend 60 days in schools developing their understanding and practicing the skills necessary to allow them to assume the full role of the teacher in a secondary school.

**UNIT CODE AND TITLE:** TX820 Teaching Experience 2  
and Team Enterprise Project  
**CREDIT POINTS:** 60  
**PREREQUISITE(S):** Nil  
**COREQUISITE(S):** Nil  
**EXCLUSION(S):** Nil  
**DURATION:** One Semester  
**OFFERED:** Semester 1 or 2

**CONTENT:**

This unit develops sequentially from TX620. The Professional Practice seminar series will have as its focus 'Professional Responsibility and Readiness'. Students will have the opportunity to develop insights into the teaching profession from a range of sources. The place of technology in professional practice will be explored. The second part of the unit is the 60-day supervised teaching experience where students will further develop the skills and attitudes appropriate for successful and principled practice within the teaching profession.

# Appendix E: Course Regulations

## 1. Academic Progression

### 1.1 Normal Progression

Students may progress through the Bachelor of Education/Bachelor of Technology course if:

- they are awarded a pass grade or higher in all required units;
- they are awarded a pass grade or higher in all prerequisites for a unit before attempting that unit.

### 1.2 Restricted Progression

Unsatisfactory progress on the Bachelor of Education will be considered to have occurred in cases where a student has:

- a Not Pass grade in two or more units in any semester of full time study or pro rata for less than full time study; or
- a Not Pass grade in a unit previously failed; or
- a Not Pass grade in one practicum unit; or
- unsatisfactory performance in the practicum phase of one semester.

Consequences of unsatisfactory progress

- all students with unsatisfactory progress will be informed of their standing by mail on or before the date of publication of results.
- students with unsatisfactory progress may be required to attend an interview at which they will be counselled regarding their work.
- after the Head of School has given a student notified under 1.2 (above) an opportunity to make a submission either in writing or in person, the Head of School shall advise the student that the student is:

excluded from the course, or  
suspended from the course for a specified period, or  
restricted as to enrolment, or  
permitted to continue in the course without conditions.

This course Regulation is to be applied within the framework of Statute 5.5 – Unsatisfactory Progress.

## 2. Assessment

Assessment criteria for each academic unit must be clearly identified in unit descriptions that are given to students at the commencement of each semester.

## 3. Supplementary Assessment

The Progress Review Sub-committee of the School of Education Courses Committee may, in exceptional circumstances, offer supplementary assessment to any student in any unit if the Committee considers that the circumstances warrant such supplementary assessment.

## **Appendix F: Work Experience in Industry**

A component of a course which satisfies all the following criteria:

- The component generates credit which counts towards a course's total credit requirements.
- It is undertaken through paid or unpaid work and associated instruction in an organisation other than the institution.
- It involves regular and planned supervision and instruction of the student.
- The supervision and instruction is undertaken in accordance with guidelines agreed between the institution and the organisation.
- While the supervision and instruction may be monitored by the institution, it is not undertaken or paid for by the institution. However, there may be occasional contact between the student and staff of the institution.
- The work undertaken by the student in the organisation involves the use of skills and knowledge relevant to the course for which the component generate credit.
- The student may or may not be employed by the organisation in which the component is undertaken.