There are presently four information technology subjects offered within the South Australian Certificate of Education (SACE). Information Technology falls within the Technology Learning Area and the learning objectives for each curriculum document (called Extended Subject Frameworks or ESFs at year 11, and Syllabuses at year 12) are grouped into the domains of Designing, Skills, Knowledge and Understanding, and Issues, in line with the National Statements and Profiles. In year 11 (SACE Stage 1) students can study Computing as a semester or full year subject. In year 12 (SACE Stage 2) there are presently 3 subjects, Information Technology and Technology/Computer Applications, both school assessed and externally moderated, and able to be offered as one semester or full year programs, and Information Technology Studies, a full year program, which is publicly examined with the course work statistically moderated by the examination.

All three stage 2 subjects are studied in South Australia and the Northern Territory, and Information Technology Studies is undertaken by students at schools in Malaysia which are part of the South Australian Matriculation (SAM) program.

Computing was first accredited in 1991, and Information Technology and Information Technology Studies in 1993. Minor changes have been made to the Computing and Information Technology Studies documents since this time. Computer Applications is a context within the Technology syllabus, first accredited in 1993 and revised in 1998.

Computing, Information Technology and Information Technology Studies have been redeveloped in 1999-2000, and the redeveloped curriculum statements, if Board accredited by the end of 2000, will be implemented in schools in 2002. The focus of this paper is on the existing curriculum documents, with an overview of what is planned in the redevelopment.

The redeveloped curriculum statements are outcomes based, and the learning outcomes reflect the strands of the Design and Technology Learning Area in the new South Australian Curriculum Standards and Accountability Framework, Designing, Making and Critiquing. An additional content strand, Information Technology Concepts, has been included. As well, Stage 1 and 2 Vocational Curriculum Statements in Information Technology have been developed over the past 9 months, and have been accredited by the SSABSA Board for a 2-year monitored trial in 2001-2. A student successfully completing 4 topics (a full year course in year 11 and in year 12) has the opportunity to complete most of Certificate III (General) in Information Technology, as well as obtaining a scalable score out of 20 which can be counted towards a tertiary aggregate.

Demographics - Based on data from the SSABSA Annual Report 1999

<table>
<thead>
<tr>
<th>Subject</th>
<th>Students</th>
<th></th>
<th>Schools</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Data not</td>
<td>available</td>
</tr>
<tr>
<td>Computing</td>
<td>4998</td>
<td>3618</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td></td>
<td>SA</td>
<td>SA</td>
</tr>
<tr>
<td>Technology</td>
<td></td>
<td></td>
<td>461</td>
<td>233</td>
</tr>
<tr>
<td>Studies</td>
<td></td>
<td></td>
<td>NT/Malaysia</td>
<td>NT/Malaysia</td>
</tr>
<tr>
<td></td>
<td>102</td>
<td>175</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td></td>
<td></td>
<td>SA</td>
<td>SA</td>
</tr>
<tr>
<td>Computing/</td>
<td></td>
<td></td>
<td>482</td>
<td>331</td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td></td>
<td>NT</td>
<td>NT</td>
</tr>
<tr>
<td>Applications</td>
<td></td>
<td></td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Technology/</td>
<td></td>
<td></td>
<td>SA</td>
<td>SA</td>
</tr>
<tr>
<td>Computer/</td>
<td></td>
<td></td>
<td>77</td>
<td>58</td>
</tr>
<tr>
<td>Applications</td>
<td></td>
<td></td>
<td>NT</td>
<td>NT</td>
</tr>
<tr>
<td></td>
<td>82</td>
<td>98</td>
<td>11</td>
<td></td>
</tr>
</tbody>
</table>
All courses except Information Technology Studies, which has a 50% publicly examined component, have been written as frameworks to allow schools considerable flexibility in the development of programs. The relative domain emphasis can be adjusted within the limits prescribed to allow the development of programs that reflect and respond to the needs and experiences of a diverse range of students.

Since 1997 up to 80% of the programmed class time in SSABSA accredited subjects can be embedded VET (vocational education and training), where students undertake programs which both meet the objectives of the SACE program, and allow students to gain credit towards a VET qualification. VET is defined as “a structured sequence of education and training which provides a range of flexible pathways, endorsed or accredited within the National Training Framework.” Many IT programs at Stage 1 and Stage 2 are designed by teachers to include embedded modules/units of competency. Satisfactory completion of Stage 2 Information Technology and Information Technology Studies also enables students to obtain advanced standing in for certain modules, upon admission to a VET course offered by TAFE SA.

DESCRIPTION OF THE EXISTING SUBJECTS

The Stage 1 Computing ESF is designed to recognise the diverse and changing nature of technology education, and allow developmental and innovative programs. It aims to give students the confidence, understanding and skills to use computer technology and its products, and is based on the use of computers. Each semester consists of two modules. The Foundation module provides a basis for further learning in computing, and should be undertaken by students without a background in computing. Most other modules are applications based, and several modules can lead to a second extension module. There is also the option for schools to develop their own Open modules, which can embrace new developments or approaches in computing. Students can undertake up to 4 semesters of Computing within the SACE. At stage 1 student achievement is recorded as Satisfactory Achievement, Recorded Achievement, or Requirements Not Met.

The Stage 2 Technology syllabus allows schools to offer programs in a wide range of technological contexts. One of these is Computer Applications. Students use the four parts of the designing process (Investigate, Devise, Produce, Evaluate) to develop solutions, achieve outcomes, and to judge the effectiveness of both the solutions and the outcomes. They develop skills in selection and use of techniques and systems, finding, interpreting and applying information, and communicating in a technological context. They know, understand and apply relevant scientific and mathematical principles and key facts, ideas and principles about processes and systems. They describe and appraise aspects of technology and its impact on individuals, society and/or the environment. The choice of software used is up to the particular school, and a diverse range of programs are offered, ranging from word processing, spreadsheets and databases to programming, presentation software, graphics, multimedia and web page design.

Stage 2 Information Technology again is a framework syllabus. It has a compulsory unit (semester) of Information Systems which can be offered in the context of either relational databases or programming. Almost all schools opt for databases. The second unit in the program can comprise any two of the following half units: Applications, Communications, Computer Control and Interfacing, Design and Development, Microcomputer Management, or Programming. If the database context is chosen for Information Systems, a different type of software must be used if the Applications half unit is chosen. In this situation most schools choose spreadsheets. If the programming context is chosen, a different learning context or type of task must be adopted. The Design and Development half units are designed to allow students to undertake a personal and practical project in IT. At the end of the program, students should be able to understand, use and document a systems development life cycle, including problem definition, analysis, design, development, implementation and review. They develop skills in effective management and use of information processing systems, an ability to analyse, plan and complete short term and long term tasks, and research, interpret and communicate ideas and information within a technological context. They demonstrate knowledge and understanding of the nature, structure and flow of data within information systems, of the relationship and interaction between the user, software and hardware, and of the function and structure of information processing software and hardware. Tasks completed include a case study, systems development tasks, and practical skills tests.

In Stage 2 Information Technology Studies the domain weighting is prescribed in the syllabus. The study of information systems is fundamental to the syllabus, with students undertaking case studies of existing or hypothetical systems. The major practical component involves design and development of an information system for a realistic situation, using the systems development life cycle. Students explore the impact of computer based information systems on users and the community. A knowledge and understanding of communications, together with associated issues, is developed. Students develop knowledge and understanding of the function and structure of information processing software and hardware, and of the nature, structure and flow of data within information processing systems. Assessment of Information Technology Studies includes an external examination weighted at 50% and a systems development project weighted at 20%. The project is school assessed and externally moderated. Course work completed during the year, with the only constraint, the requirement that a mark for a practical programming project be included, is weighted at 30%, and statistically moderated by the examination.

In all stage 2 subjects students are awarded a mark out of 20 as their subject achievement score.

INTERNATIONAL BACCALAUREATE

Some South Australian schools offer the International Baccalaureate as an alternative to the SACE. The IB offers a
subject called Information Technology in a Global Society.

VOCATIONAL EDUCATION AND TRAINING

Within the SACE students can undertake Vocational Education and Training (VET) units of competency. VET embedded in SACE subjects has already been discussed. As well, up to 8 stand alone VET units can be undertaken, 50 nominal hours being counted as one SACE unit at stage 1 level. A large number of schools will be participating in a trial of delivery of Certificate II in Information Technology, in many cases in years 9-11, next year, in conjunction with one of the institutes of TAFE SA.

JUNIOR SECONDARY INFORMATION TECHNOLOGY PROGRAMS (YEARS 8-10)

Programs vary according to school policies and available resources. As noted above, a number of schools offer students the opportunity to complete all or part of AQF IT qualifications from year 8 onwards. Many schools are offering students the opportunity to complete all or part of AQF IT qualifications from year 8 onwards. A large number of schools will be participating in a trial of delivery of Certificate II in Information Technology, in many cases in years 9-11, next year, in conjunction with one of the institutes of TAFE SA.

REDEVELOPMENT OF INFORMATION TECHNOLOGY SUBJECTS

Stage 1 Computing and Stage 2 Information Technology and Stage 2 Information Technology Studies have been redeveloped. At the time of writing, these curriculum statements are drafts which have been sent out for consultation, and now have to undergo a formal accreditation process. Stage 1 Computing becomes Stage 1 Information Technology. Stage 1 and 2 of the subject have been written together to reflect the current and developing nature of IT and articulate stage 1 with stage 2 topics. There is an emphasis on information systems and on designing and making using the systems development life cycle.

For Stage 1 and Stage 2 Information Technology, two topics make a semester program. Stage 1 Information Technology topics include Computer Systems, Relational Database Systems, Programming, Applications, involving the use of an application which allows data entry, storage, manipulation, outputting results of processing, and Open, which allows schools to develop a topic to support the specialist needs of students. The Applications and Open topics can be undertaken more than once in a program. Stage 2 Information Technology topics include Information Systems (compulsory), Relational Databases, Programming, Interactive Multi-media, Web Applications and Open, designed to allow students to acquire knowledge and skills in an area of information technology not covered by the scope of other topics in the curriculum document.

Stage 2 Information Technology Studies (publicly examined component 50%) is organised into four related sections, each containing 3 topics. All sections must be completed. They are:

- Information systems and relational databases
  - Information systems in society
  - Relational database concepts
  - Designing a relational database using the systems development life cycle

- Computer systems
  - Software
  - Hardware
  - Data

- Networks and Communications
  - Networks
  - Internet technology
  - Applications and implications of communications

- Programming
  - Programming principles and concepts
  - Programming languages
  - Programming issues
THE VOCATIONAL CURRICULUM STATEMENTS

SSABSA has developed three Vocational Curriculum Statements which have been recently accredited by the Board for a two year trial in 2001-2002. One of the statements is based on the Information Technology Training packageICA99.

These Vocational Curriculum Statements have been developed as a response to the MCEETYA recommendations, April 1999.

Recommendation 2

VET to provide a direct contribution to tertiary entrance scores

Recommendation 10

Develop increased range of programs based on qualifications from Training Packages

Recommendation 11

Achieving greater recognition of VET for the purposes of tertiary selection

In these curriculum statements units of competency have been bundled into related topics equivalent to one SACE unit in length to encourage coherence in the teaching and learning program, provide students with a systematic pathway and reinforce overlapping skills and knowledge. At Stage 1 a full year course consists of two topics plus a concurrent workplace learning topic. Stage 2 students can choose from 3 topics. A full year course consists of two topics. Students may elect to undertake a third topic. Students gain credit towards Certificate III in Information Technology. Students who successfully complete 4 topics (two at Stage 1 level and two at Stage 2 level) will gain credit towards 8 or 9 of the 11 core units in Certificate III in Information Technology (General), and 2 of the 4 elective units. To obtain a mark out of 20, at Stage 2, students undertake common assessment task types based upon their work in achieving the competencies. Stage 2 assessment components include a folio of tasks completed, a case study or project, and a work placement report. These components will be school assessed and externally moderated.

The monitored trial of the vocational curriculum statements will help determine if the bundling of the competencies is appropriate, and if it allows for integrated teaching and learning, if the level chosen (AQF Certificate III) is appropriate, and if the common task types chosen are appropriate to assess the underlying skills and understandings of the units of competency.

PROFESSIONAL DEVELOPMENT OPPORTUNITIES FOR TEACHERS

The Senior Secondary Assessment Board of South Australia (SSABSA) offers workshops for new teachers of IT subjects. In-course moderation support is available on a needs based approach.

The Information Technology moderators manage a web site which contains advisory materials for teachers. Teachers are invited to attend final central moderation of Stage 2 Information Technology Studies projects and Stage 2 Information Technology second semester tasks. (The moderation of first semester tasks occurs early in semester 2, usually when the moderator visits the teacher at the school). An assessment report for each subject is published annually, written by the Chief Assessor. Members of the moderation and marking panels meet to set benchmark standards on assessment of student work.

SSABSA has an Information Technology Subject Advisory Committee which includes a number of teachers as expert educators. These committees have a 3 year tenure. Their role includes syllabus redevelopment, implementation and consolidation.

Private organisations offer courses which help teachers upgrade their skills in software use.

The University of South Australia offers a Graduate Diploma in Educational Computing for practising teachers. A Graduate Bachelor of Education Preservice specialising in Technology Education offers graduates with Information Technology/Computing qualifications, a pathway to teaching.

CEG ACTIVITY

CEGSA produces an Information Technology Studies Revision Guide annually. This contains examination paper solutions for a number of previous years. An Information Technology Studies area is planned for this site. CEGSA’s management team presently includes Kerrie Smith of Charles Campbell Secondary School. Kerrie teaches senior secondary Information Technology.

ISSUES ABOUT INFORMATION TECHNOLOGY IN S.A.

There is a lack of system support for IT teachers. There is little or no professional development support provided by the education sectors. Informal networks provide the majority of support for teachers. Many IT coordinators have responsibility for network management, and many will spend many hours of their own time on this task. Probably the biggest problem is the lack of a specific tertiary training program which provides training opportunities for senior secondary IT teachers, and lack of opportunities for regular professional updating in this area.

CONTACT INFORMATION

Senior Secondary Assessment Board of South Australia
60 Greenhill Road
Wayville SA 5034
Ph 08 8372 7400
Web site www.ssabsa.sa.edu.au

SSABSA Curriculum and Assessment Officer - Technology
Anne Ballard
Ph 08 8372 7461
Fax 08 8372 7592
Email anne@ssabsa.sa.gov.au

SSABSA Assessment Field Officer - Technology
Keith Burgess
Ph 08 8372
Fax 08 8372 7592
Email keithb@ssabsa.sa.gov.au

Information Technology moderators’ web site
www.olsh.sa.edu.au/infotech

CEG web site
www.cegsa.sa.edu.au

CEG contact person
Kerrie Smith
Email kerrie.smith@senet.com.au