



An Introduction to Software Design and Development Stage 6 in the New HSC

The new *Software Design and Development Stage 6 Syllabus* together with the *Information Processes and Technology Stage 6 Syllabus* replace the current syllabuses in Computing Studies (2 Unit General, 2/3 Unit Common, and 3 Unit). The new syllabus is for implementation with Year 11 in 2000 and will be first examined in 2001.

The syllabus provides information that was formerly available in the KLA handbook. This includes descriptions of course requirements, assessment weightings for internal and external examination and examination specifications.

What is similar?

The two core topics in the 2/3 Unit Common Computing Studies course have been substantially retained. The systems topic is the basis for the whole of the Preliminary and HSC courses. The algorithm topic has been retained and expanded to allow students to experience the implementation of a solution design through the use of a programming language, macros or scripts.

What are the overall improvements?

Students are exposed to practical implementation of designs from the start of the Preliminary course.

Skills in teamwork, which were previously not formally addressed but were assumed, are specifically covered in this course, with a particular focus on recognising the contribution made by users in terms of developing an appropriate solution.

Practical experience in building software solutions gained in the Preliminary course (perhaps as part of a team) will prepare students well for the individual major project, which is a significant part of the assessment in the HSC course.

Specific reference is made to the availability of modules of code that may already have been developed. This allows students the opportunity to utilise such modules in order to build a substantial solution, without the need for them to develop the complete software solution by themselves.

The steps involved in developing meaningful software solutions are specifically defined, to allow students to follow a methodical approach in developing their projects.

Ethical and legal considerations recognise the existence and importance of the Internet in current software development practice, and issues such as the rights and responsibilities of developers are specifically addressed at every stage of the development process. The syllabus content allows new and emerging technologies to be addressed, with a special emphasis on the historical developments that have led to these new technologies. This

approach allows the syllabus to remain current. Students build their understanding of new technologies on the basic fundamentals, which they have experienced.

The following changes have been made to particular sections of the syllabus

Rationale, Aim and Objectives (pp 6, 8)

The rationale provides a clear indication of the purpose of the Software Design and Development syllabus as an emerging area of study within the broad field of Information Technology and Computing.

The aim now succinctly states the intention of the syllabus and places an increased emphasis on solving problems through the creation of software solutions.

The objectives have been reduced to six statements that integrate the knowledge, skills and attitudes that are central to Software Design and Development Stage 6.

Course structure (p 9)

The overview of the course structure is described below:

2 Unit Preliminary Course	2 Unit HSC Course
<p>Concepts and Issues in the Design and Development of Software (30%)</p>	<p>Development and Impact of Software Solutions (15%)</p>
<p>Introduction to Software Development (50%)</p>	<p>Software Development Cycle (40%)</p>
<p>Developing Software Solution (20%)</p>	<p>Developing a Solution Package (25%)</p> <p>One of the following options: (20%)</p> <p>1. Evolution of Programming Languages</p> <p style="text-align: center;">OR</p> <p>2. The Software Developer’s View of the Hardware</p>

Outcomes (p 11)

The Stage 6 outcomes have been reduced in number, with outcomes for each of the Preliminary and HSC courses. These outcomes have been developed to facilitate outcomes-based programming, assessment and reporting processes. The outcomes have clear links to the content of the syllabus.

Content (pp 20–57)

The scope and depth of course content has been made clear by the description of what ‘students learn about’ and what ‘students learn to’.

In the Preliminary course, new areas of content are:

- the implementation of algorithms into program code, macros or scripts (currently in the 3 Unit computing Studies course) including:
 - the syntax and environment of a programming language
 - the concept of program maintenance
 - techniques used during the testing of software
 - evaluation of completed software
 - communication issues involved during software development, including team work aspects
 - project management techniques
- the social and ethical issues associated with software interface design, including the special strengths of software developers and inclusivity
- the different type of operating systems and their effect on the software running under its control
- different approaches to software development

Content that has been removed from the Preliminary course includes application software usage, although it should be noted that students are expected to make use of common software packages throughout their project work.

In the HSC course, new areas of content are:

- the implementation of more complex logic and data structures into program code, including:
 - the development and use of standard modules
 - customisation of existing software
 - use of case tools in the software development process
 - the processes of translating and linking software routines
 - the use of a methodical debugging approach to testing
 - the process of evaluation of complex software and the use of benchmarking and quality assurance as evaluation tools
 - production of documentation associated with the developed software
 - project management techniques, including communication with others
- social and ethical issues associated with rights and responsibilities of software developers
- current trends in software development (covered with a case study)
- the ‘fetch execute cycle’ and the concepts associated with machine code

The two new option topics are:

- The Evolution of Programming Languages (which was covered as a topic in the current 3 Unit Computing Studies syllabus).
- The Software Developer’s View of Hardware (including much from the current Computing Technologies topic).

Content that has been removed from the HSC course includes the current option topics (except for Computer Technologies, which is now incorporated into one of the new options).

Course Requirements (p 58)

Practical activities using a computer should occupy a minimum of 20% of course time in the Preliminary course and 25% in the HSC course.

Software specifications and methods of algorithm description are prescribed for Software Design and Development Stage 6.

Assessment (p 60)

The use of a range and balance of assessment tasks is encouraged. It is expected that the assessment tasks will not simply replicate the external examination. Internal assessment tasks should assess outcomes and course content.

What will be needed to teach this subject?

- *Software Design and Development Stage 6 Syllabus*
- Specimen examination and marking guidelines
- Software specifications and methods of algorithm description are prescribed for Software Design and Development Stage 6. These will be published on the Board's website.

While programs will need to be revised to reflect new syllabus content and outcomes, aspects of current programs may be incorporated where appropriate.

Equipment, used in schools, that meets the requirements of the current syllabus should be adequate to meet the requirements of the new syllabus.

Current resources are appropriate for use with the new syllabuses although there may need to be some adjustment in the way teachers use them.

A further subject-specific document is being developed by the Board of Studies for distribution later in the year. This will assist teachers with the implementation of the revised syllabuses.

A list of a number of resources will be placed on the Board's website, <http://www.boardofstudies.nsw.edu.au>.

The Board of Studies will also provide assessment support materials, which will be generic across subjects.

Cross-sectoral professional development workshops (Department of Education and Training, Catholic Education Commission and members of the Association of Independent Schools) for Software Design and Development Stage 6 will be held. Venues and dates for these workshops have been published on the *New HSC* website — <http://www.newhsc.schools.nsw.edu.au> — and distributed to schools. The materials from the workshops will be available on this website.

CURRICULUM SUPPORT for Teaching in Technology and Applied Studies 7–12 — a publication distributed each term by the Department of Education and Training — will carry an HSC supplement.

Assessment and Reporting Bulletin — published each term as a joint venture of the Department of Education and Training, the Catholic Education Commission and the Association of Independent Schools — will build on principles outlined in Board of Studies' newsletters and assessment support materials.