

Software Design and Development

Stage 6 Draft Syllabus Package

Consultation Report

1. Background

The preparation of the **Software Design and Development** Stage 6 Draft Syllabus Package took into account the instructions described in the writing brief approved by the Board in **December 1998**.

The **Software Design and Development** Stage 6 Draft Syllabus Package has been distributed widely for comment over the period **15th March 1999 –26th April 1999**. Additionally, consultations on the **Software Design and Development** Stage 6 Draft Syllabus Package have included responses from the following:

- ⇒ School sector representatives
 - Department of Education and Training
 - Association of Independent Schools
- ⇒ Tertiary representatives
 - Dr Alan Fekete – University of Sydney
 - Denise Tolhurst – University of New South Wales
 - G McCleary / M Fairbourn – Nepean TAFE
 - Dr Chris Reading – School of Curriculum Studies
 - Prof. Ray Offen – Macquarie University
- ⇒ Professional associations
 - Cathy Nielsen – TEA / ITE Association
 - Computer Studies Teachers Association
- ⇒ The Board Curriculum Committee for **Computing Studies**.
- ⇒ Industry
 - Arthur Richardson – Sun Microsystems

Modifications to this draft, following widespread consultations, will enable the syllabus package to be finalised for submission to the Board Curriculum Committee, and the Board.

56 written responses to the consultation progress report in **Software Design and Development** were received. The sample profile is as follows:

56 Individual responses

Teachers	37			
Rural	11			
Government	6	Catholic	2	Independent 3
Metropolitan	26			
Government	13	Catholic	5	Independent 8
Academics	5			
Others	14			

50 institution/group responses

Organisation details:

Schools:	39			
Moderate (<500)	6	Medium (500 – 800)	11	Large (>800) 22
Government	26	Catholic	6	Independent 7
Tertiary/post-school:	6			
Universities	3	TAFE	1	Industry/training 2
Special Interest:	5			
Parent Groups	0	School Sectors	2	Other (BCC) 1
Teacher/professional associations			2	

Key Issues

Summary of Key Issues for Stage 6 Software Design and Development arising from the consultation process:	Summary of action taken as a result of these Key Issues:
<ul style="list-style-type: none">• Objectives, outcomes and assessment components need refining• The two option topics need to be refocused to reflect the intention of the course• It needs to be emphasised that social and ethical issues are an integral part of all sections of the course	<ul style="list-style-type: none">• A reference group along with the writer for SDD reviewed the objectives, outcomes and assessment components. The writers have amended the Draft Syllabus according to the recommendations of this group. (Page 11)• The option topics have been revised to address these concerns. (Page 54)• The writers have amended the Draft Syllabus to address this concern

3. Analysis

3.1 Quantitative Analysis

3.1.1 Software Design and Development in the Stage 6 Curriculum

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
6	11	28	2	1	0
13%	23%	58%	4%	2%	0%

3.1.2 Pathways for Software Design and Development Stage 6 Students

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
4	14	25	0	4	1
8%	29%	52%	0%	8%	2%

3.1.3 Aim

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
5	10	26	3	4	0
10%	21%	54%	6%	8%	0%

3.1.4 Objectives

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
5	8	31	1	2	1
10%	17%	65%	2%	4%	2%

3.1.5 Course Structure

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
7	8	24	5	2	2
15%	17%	50%	10%	4%	4%

3.1.6 Outcomes

3.1.6a Preliminary course outcomes

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
5	9	24	7	2	1
10%	19%	50%	15%	4%	2%

3.1.6b HSC course outcomes

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
5	9	24	6	3	1
10%	19%	50%	13%	6%	2%

3.1.7 Content

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
5	7	25	7	3	1
10%	15%	52%	15%	6%	2%

3.1.8 Course Requirements

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
7	12	25	1	1	2
15%	25%	52%	2%	2%	4%

3.1.9 Assessment Components, Weightings and Tasks

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
7	9	22	5	3	2
15%	19%	46%	10%	6%	4%

3.1.10 **Software Design and Development** Stage 6 HSC Examination Specifications

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
5	7	27	3	3	3
10%	15%	56%	6%	6%	6%

3.1.11 Post-School Opportunities

3.1.11a Links between courses and training packages

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
7	3	16	19	3	0
15%	6%	33%	40%	6%	0%

3.1.11b Links between courses and VET opportunities

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
10	5	14	15	4	0
21%	10%	29%	31%	8%	0%

3.1.12 **Software Design and Development** Stage 6 Sample HSC Assessment Items

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
8	9	26	2	0	3
17%	19%	54%	4%	0%	6%

3.1.13 **Software Design and Development** Stage 6 Draft Performance Bands

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
9	7	24	3	4	1
19%	15%	50%	6%	8%	2

3.1.14 Overall Evaluation

Nil Response	Excellent as is	Good, with fine-tuning	Acceptable with re-working	Unsure	Unsatisfactory in issues treatment
4	4	21	11	3	5
8%	8%	44%	23%	6%	10%

3.2 Issues Raised and Writing Team Action

Syllabus Item	Issues	Source/s	Action
Software Design and Development in Stage 6 Curriculum	<ul style="list-style-type: none"> In general the rationale is supported. The rationale could be streamlined to provide a more logical flow and structure. 	<ul style="list-style-type: none"> DET BCC 	<ul style="list-style-type: none"> The writers have refined the rationale. (Page 6)
Pathways for Software Design and Development Stage 6 Students	<ul style="list-style-type: none"> This diagram was well supported. Minor alterations to clarify the intention of entry to post secondary options is required. 	<ul style="list-style-type: none"> BCC 	<ul style="list-style-type: none"> The writers have amended the diagram to address these concerns. (Page 7)
Aim	<ul style="list-style-type: none"> This section was well received. 	<ul style="list-style-type: none"> DET Various individual responses 	<ul style="list-style-type: none"> Noted.
Objectives	<ul style="list-style-type: none"> There is an absence of objectives that focus on designing effective and creative solutions. 	<ul style="list-style-type: none"> BCC DET various individual and school responses 	<ul style="list-style-type: none"> A reference group along with the writers for SDD reviewed the objectives, outcomes and assessment components. The writers have amended the Draft Syllabus according to the recommendations of this group. (Page 11)

Syllabus Item	Issues	Source/s	Action
Course Structure	<ul style="list-style-type: none"> • A diagram (similar to that contained in the Draft IPT Syllabus p.14) would be valuable in summarising and presenting the content of the course. • The diagram needs to be reformatted with appropriate alignment between the stages in both preliminary and HSC courses. • The stages of the software development cycle are referred to differently in the Preliminary and HSC courses. 	<ul style="list-style-type: none"> • DET • BCC • DET • BCC • various individual responses • DET • BCC • various individual responses • CSTA • AIS 	<ul style="list-style-type: none"> • A diagram has been developed for inclusion in the final syllabus. (Page 10) • The writers have amended the Draft Syllabus Course Structure diagram accordingly. (Page 10) • The Preliminary course contains an introduction to the software development cycle whereas the HSC course formalises the approach. The writers have amended the Draft Syllabus Course Structure diagram to reflect this. (Page 9)

Syllabus Item	Issues	Source/s	Action
	<ul style="list-style-type: none"> • The percentages contained in the course structure model are confusing. • It was felt that the shading for “Developing a solution Package” in the HSC course did not assist in the understanding of the course structure. 		<ul style="list-style-type: none"> • The words ‘indicative course time’ have been added to the diagram to clarify this issue. (Page 9) • The writers have amended the Draft Syllabus Course Structure diagram accordingly (Page 10)
Outcomes	<ul style="list-style-type: none"> • Some minor changes to wording of outcomes may help to clarify the intention of the course including its practical nature and the role of emerging technologies 	<ul style="list-style-type: none"> • BCC • DET • CSTA • various individual responses 	<ul style="list-style-type: none"> • A reference group along with the writer for SDD reviewed the objectives, outcomes and assessment components. The writers have amended the Draft Syllabus according to the recommendations of this group. (Page 11)

Syllabus Item	Issues	Source/s	Action
Content	<ul style="list-style-type: none"> • Content in the Draft Syllabus was strongly supported, with recommendations for some refining in the following areas; <p><u>PRELIMINARY COURSE</u> Social and ethical issues</p> <ul style="list-style-type: none"> • It should be emphasised that these issues are an integral part of all sections of the course. <ul style="list-style-type: none"> • Reword Software Licenses to become Intellectual Property • Reword the section on inclusivity particularly with reference to gender issues • 	<ul style="list-style-type: none"> • BCC • DET • CSTA • various individual responses • Joint Council • Academics <ul style="list-style-type: none"> • DET • BCC <ul style="list-style-type: none"> • DET • BCC 	<ul style="list-style-type: none"> • The writers have rewritten specific content areas according to feedback from consultation. <ul style="list-style-type: none"> • The writers have included in the introduction to this topic discussion that indicates the intention is to integrate this topic into all subsequent topics in the course. (Page 14) This, together with the diagram on page ... makes the relationship explicit. <ul style="list-style-type: none"> • These have been reworded. (Page 14)

Syllabus Item	Issues	Source/s	Action
	<p>Software Development Approaches and Software Development Cycle</p> <ul style="list-style-type: none"> • Change the order of 2.8.3 and 2.8.4 to allow introduction of the basic concepts first <p>Checking Software Solutions</p> <ul style="list-style-type: none"> • Rename Peer Checking to Evaluation of Proposed Design • Include specific references to different methods of evaluation. <p>Modifying Software solutions</p> <ul style="list-style-type: none"> • Change references to program code to allow greater access by students of lower abilities <p><u>HSC COURSE</u></p> <p>Social and Ethical Issues</p> <ul style="list-style-type: none"> • The reference to 2000 Y2K bug will date the syllabus 	<ul style="list-style-type: none"> • BCC • Giraween HS <ul style="list-style-type: none"> • BCC <ul style="list-style-type: none"> • BCC • Various schools <ul style="list-style-type: none"> • DET 	<ul style="list-style-type: none"> • The writers have amended the Draft Syllabus accordingly (Page 18) <ul style="list-style-type: none"> • This section has been revised. (Page 25) <ul style="list-style-type: none"> • The writers have amended this section to address these concerns. (Page 27) <ul style="list-style-type: none"> • The Y2K bug will continue to be a valuable example of a significant social / ethical issue. (Page 32)

Syllabus Item	Issues	Source/s	Action
	<ul style="list-style-type: none"> • Reword section entitled Market Domination to become The Software market • Include a reference to the rights and responsibilities of software developers <p>Application of Software Development Approaches</p> <ul style="list-style-type: none"> • Include reference to different methods of implementation once a system has been fully developed • Include a reference to CASE tools in the development process <p>Planning and Design of Software Solutions</p> <ul style="list-style-type: none"> • Include a reference to customisation of existing software, to allow access by less able students • Include some simpler standard algorithms, to allow access by less able students 	<ul style="list-style-type: none"> • Various schools • DET <ul style="list-style-type: none"> • CSTA • BCC <ul style="list-style-type: none"> • Exam Committee for SDD 	<ul style="list-style-type: none"> • This is now included. (Page 32) • This is now included. (Page 32) • This section has been reworded. (Page 33) • This section has been modified accordingly. (Page 34) • This section has been modified accordingly. (Page 38)

Syllabus Item	Issues	Source/s	
	<p>Implementation of Software Solution</p> <ul style="list-style-type: none"> • Elements of the fetch execute cycle and role of hardware should be included in the HSC course. <p>Maintenance of Software Solutions</p> <ul style="list-style-type: none"> • Include in the introductory statement a reference to the fact that the maintenance process also follows the cyclic approach <p>Options - Paradigms</p> <ul style="list-style-type: none"> • Rename Paradigms to Evolution of Programming Languages to better reflect the intent and focus of the topic • Remove need to select and study one paradigm in depth, but rather include reference to all paradigms, and their commonalities and differences 		<p style="text-align: center;">Action</p> <ul style="list-style-type: none"> • This section has been modified to include this. (Page 42) • This section has been modified accordingly. (Page 48) • This section has been modified accordingly. (Page 54) • The writers have amended the Draft Syllabus accordingly (Page 54)

Syllabus Item	Issues	Source/s	Action
	<p>Options – Hardware Design and Operation</p> <ul style="list-style-type: none"> • Include an introductory statement to relate the option topic to the core content. Reference should be made to the fact that the design of circuitry follows the standard cycle, and that it also allows a deeper understanding of how the software utilises the hardware • Include ASCII representation, Hexadecimal and floating point arithmetic • Remove references to K-maps 	<ul style="list-style-type: none"> • BCC • Various schools 	<ul style="list-style-type: none"> • The writers have amended the Draft Syllabus accordingly (Page 56) • The writers have amended the Draft Syllabus accordingly (Page 56) • This has been removed.

Syllabus Item	Issues	Source/s	Action
Course Requirements	<ul style="list-style-type: none"> This section was strongly supported. 	<ul style="list-style-type: none"> DET BCC Various schools 	<ul style="list-style-type: none"> Noted
Assessment components, weightings and tasks	<ul style="list-style-type: none"> The weightings provide few guidelines for teachers. More information and assessment schemes will need to be provided. The weighting allocated to project work should be increased. 	<ul style="list-style-type: none"> DET Exam Committee for SDD Various schools 	<ul style="list-style-type: none"> A reference group along with the writer for SDD reviewed objectives, outcomes and assessment components. The writers have amended the Draft Syllabus according to the recommendations of this group. (Page 64) The weighting will remain as 25% as the majority of respondents did not favour an increase in weighting of project work.
Software Design and Development Stage 6 HSC Examination Specifications	<ul style="list-style-type: none"> Remove Section IV, and subsume into Section II Note that the multiple choice questions can be drawn from any section of the core Reword the topics so that are the same as the syllabus headings 	<ul style="list-style-type: none"> Exam Committee for SDD 	<ul style="list-style-type: none"> The exam specifications have been altered to address these concerns. A complete sample paper has been developed. (Page 65)

Syllabus Item	Issues	Source/s	Action
Post-School Opportunities	<ul style="list-style-type: none"> This section was confusing to many teachers. 	<ul style="list-style-type: none"> Various teacher and school responses. 	<ul style="list-style-type: none"> The text in this section has been revised. (Page 60)
Software Design and Development Stage 6 Sample HSC Assessment Items	<ul style="list-style-type: none"> The sample items reflect the demands of a course for higher ability students. 	<ul style="list-style-type: none"> DET 	<ul style="list-style-type: none"> A complete sample HSC exam has been developed which caters for a broader range of student abilities.
Software Design and Development Stage 6 Draft Performance Bands	<ul style="list-style-type: none"> The individual descriptor statements of typical performance at each of the bands are adequate but will need to be modified in line with any changes made to the Draft Syllabus. Teachers expressed uncertainty at the role performance bands are to play in teaching, learning and assessing. 	<ul style="list-style-type: none"> DET Various individuals and schools Various schools 	<ul style="list-style-type: none"> Work on performance bands will continue. Another iteration of the draft performance bands will be published in the final syllabus package. Performance bands will not be finalised until 2001.

Syllabus Item	Issues	Source/s	Action
Overall Evaluation	<ul style="list-style-type: none"> • The overall perception is that this is a more challenging course in comparison to the Draft IPT syllabus. • More practical examples need to be provided in the 'learn to...' column. • There is a need to incorporate; <ul style="list-style-type: none"> - a glossary of syllabus specific terms to assist teachers in interpreting the document - software specifications to assist teachers in the selection of appropriate software 	<ul style="list-style-type: none"> • DET • BCC • CSTA • AIS • Many individual and school responses. • DET • some individual responses • BCC 	<p>The IPT course is being amended to ensure it is as rigorous as Software Design and Development, however, it will remain accessible to a range of students.</p> <ul style="list-style-type: none"> • The experiences contained in many of the 'learn to...' column items require a series of varied practical activities to be undertaken. Some changes have been made to clarify these. • A glossary will be included in the final syllabus (page 68) • Reference to specifications will be included in course requirements section of the syllabus (page 59)

Syllabus Item	Issues	Source/s	Action
	<ul style="list-style-type: none"> - an updated 'Methods of Algorithm Description' section to assist teachers in using appropriate algorithm and systems design tools. • To ensure that the syllabus is kept current, there is a need to publish annually a document identifying relevant emerging technologies, contemporary issues and references to relevant resources. • The significant changes reflected in this syllabus will create challenges for teachers. This necessitates the development of comprehensive support materials by OBOS. Support documents and appropriate training are essential to provide professional development to teachers to assist in implementation of the subject, especially the process of making project work an integral part of their teaching programs. Support 	<ul style="list-style-type: none"> • DET • BCC • Various schools 	<ul style="list-style-type: none"> • Reference to "Methods of Algorithm Descriptions" will be made in the course requirements section of the syllabus (page 59). • Support materials will be developed, taking into account advice received from consultation.

Syllabus Item	Issues	Source/s	Action
	Documents should include; <ul style="list-style-type: none">- sample projects- log books- current reference lists		

4. Responses

Written responses were received from the following individuals and groups:

Individuals

Name / Individual	School / Group
Harry Taylor	Trinity Grammar School
Rick Swancott	St Mary State Senior High School
Fran Westley	Taree High School
Catherine Webber	Model Farms High School
Mr Scott Sleep	Maitland Grossman High School
Paul Verstegen	Winmalee High School
Sue Martin	St Mary Star of the Sea
Jennifer Thomson	Pendle Hill High School
Rodney Galvin	MLC School, Burwood
John Kanter	Orara High School
Andrew Lock	Pacific Hills Christian School
Richard McLeod	Irrawang High School
Ron MacMaster	John Paul College
D. Grunseit	Terrigal High school
Kochu K Rajendram	Hillston Central School
Darren Payne	James Sheahan Catholic High School
Arthur Richardson	Sun Microsystems
Brian Kelly	John Paul college
Richard Mackaway	Greystanes High School
Troy Green	Bidwell High School
Stephen Reynolds	St Philips Christian college
Colin White	Billabong High School
Cathy Nielsen	TEA/ITE Association
Rae Deely	Canterbury Girls High School
Janine Martin	Brigidine College
Jim Smith	Westfields Sports High School
Jeff Palmer	Edmund Rice College
Dr Chris Reading	School Of Curriculum Studies
David Graham	Coleambally Central School
Neville Harrison	Locked Bay
Tony Sharman	lindisfarm
G. Hillis	Granville Boys School
Dr Alan Fekete	University of Sydney
Lesley Atfield	Crookwell High School
Denise Tolhurst	University of New South Wales
Maureen Davis	Maroubra
Terasa Deshon	Trinity Catholic College
Suzanne Warner dan	Trinity Catholic College

Groups
Allan Shannon & Ros Struthers - Illawarra Christian School
Computer Staff - Wyong High School
Computing Teachers - Liverpool Girls High School
CS Teachers Assoc. - Randwick Girls High School
R Nesbitt / P Zidiluns - Girraween High School
West Wyalong High - West Wyalong High School
G McCleary / M Fairburn - Nepean TAFE
Computer Studies Teachers - Dungog High school
Computing Studies Faculty - Forster high School
Department of Education and Training
Association of Independent Schools
Computing Studies Teachers Association
JFHS Computing - James Fallon High School