

# Engineering Studies

## Stage 6 Draft Syllabus Package

### Consultation Report

#### 1. Background

The preparation of the **Engineering Studies** Stage 6 Draft Syllabus Package took into account the instructions described in the writing brief approved by the Board in **November 1998**.

The **Engineering Studies** Stage 6 Draft Syllabus Package has been distributed widely for comment over the period **15<sup>th</sup> March 1999 to 23<sup>rd</sup> April 1999**. Additionally, consultations on the **Engineering Studies** Stage 6 Draft Syllabus Package have involved meetings with the following:

- ⇒ school sector representatives
- ⇒ tertiary 5 representatives
  - Dr Eric Hahn - School of Mechanical and Manufacturing Engineering, UNSW.
  - Paul McHugh, Senior Lecturer - Mechanical Engineering, Sydney University
  - Dr Barry Hill, Senior Lecturer - Mechanical Engineering, University of Newcastle
  - Gunilla Burrows – Electrical Engineering, University of Newcastle
  - Associate Professor Geoff Barton – Chemical Engineering, Sydney University
- ⇒ industry education representatives
  - Dr Gordon Pike – Optus Satellite Engineering Program
  - Andrew Gibson – Hawker Pacific Aeronautical Engineers
  - Paul Duignan – RTA- Mechanical Engineer
- ⇒ professional associations
  - The Institute of Engineers
  - The Institute of Technology Education
- ⇒ the Board Curriculum Committee for **Engineering Studies**.

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.

**45** written responses to the consultation progress report in **Engineering Studies** were received. The sample profile is as follows:

## 24 Individual responses

Teachers	<input type="text" value="23"/>			
Rural	<input type="text" value="1"/>			
Government	<input type="text" value="1"/>	Catholic	<input type="text"/>	Independent <input type="text"/>
Metropolitan	<input type="text" value="22"/>			
Government	<input type="text" value="16"/>	Catholic	<input type="text" value="4"/>	Independent <input type="text" value="2"/>
Academics	<input type="text" value="1"/>			
Others	<input type="text"/>			

## 21 institution/group responses

### Organisation details:

Schools:	<input type="text" value="12"/>			
Moderate (<500)	<input type="text"/>	Medium (500 – 800)	<input type="text" value="1"/>	Large (>800) <input type="text" value="11"/>
Government	<input type="text" value="10"/>	Catholic	<input type="text" value="2"/>	Independent <input type="text" value="0"/>

### Tertiary/post-school:

Universities	<input type="text" value="2"/>	TAFE	<input type="text"/>	Industry/training <input type="text" value="4"/>
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### Special Interest:

Parent Groups	<input type="text"/>	School Sectors	<input type="text"/>	Other <input type="text"/>
Teacher/professional associations			<input type="text" value="3"/>	

## Key Issues

<p><b>Summary of Key Issues for Stage 6 Engineering Studies arising from the consultation process:</b></p>	<p><b>Summary of action taken as a result of these Key Issues:</b></p>
<ul style="list-style-type: none"> <li>• Amount of syllabus content is ambitious to allow meaningful coverage of content.</li>   <li>• Elaboration as to the depth of study of the content in each module is required.</li>   <li>• Specification of the purpose and depth of engineering reports is required.</li>   <li>• Sample assessment questions need to reflect the complete course content as well as the depth of study required</li>   <li>• Suitable support materials need to be developed, to indicate the depth of study required of the content.</li>   <li>• The performance descriptor bands need to reflect the complete course content, objectives and outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>• No significant reduction in content has been undertaken. Specification as to the depth of study required will ensure that coverage of syllabus content is realistic and achievable in the indicative time.</li>   <li>• Specification of depth has been outlined in “students learn about” and “students learn to” columns. This has necessitated changes in content specification throughout the document.</li>   <li>• Additional information has been included as an introduction on the nature and depth of study required for the engineering report and throughout the content section.</li>   <li>• The Sample HSC Paper will incorporate a complete range of specimen questions.</li>   <li>• Content covered in the syllabus has had its depth of study clarified. Support documents are to be prepared to address needs which relate to content in the syllabus.</li>   <li>• Performance descriptors have been revised to reflect levels of achievement for all outcomes in each band.</li> </ul>

### 3. Analysis

#### 3.1 Quantitative Analysis

##### 3.1.1 Engineering Studies in the Stage 6 Curriculum

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
7	14	23	0	0	2
15.2%	30.4%	50%	0%	0%	4.3%

##### 3.1.2 Pathways for Engineering Studies Stage 6 Students

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
6	14	25	1	0	0
13%	30.4%	54.3%	2.2%	0%	0%

##### 3.1.3 Aim

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
6	14	23	3	0	0
13%	30.4%	50%	7%	0%	0%

*The responses in the “unsure” category can be attributed to respondents who expressed concern with the grammatical expression used. The aim has been amended as a result of meeting with an expert reference group.*

##### 3.1.4 Objectives

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
7	11	24	3	1	0
15.2%	24%	52.2%	7%	2.2%	0%

*The responses in the “unsure” and “disagree” categories can be attributed to respondents who expressed concern regarding the wording of the objectives. The objectives have also been amended as a result of a meeting with an expert reference group.*

##### 3.1.5 Course Structure

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
6	8	17	6	5	3
13%	17.4%	40%	13%	10.8%	7%

*The relative high response in the “unsure”, “disagree” and “strongly disagree” categories can be attributed to the confusion which exists in relation to the overlapping of meaning in the naming of modules. This issue has been addressed in modification of the table on page 9 and changes to the explanation of module types on page 10.*

*A clarification of the purpose of the Engineering Report and its depth of study requirements also prompted this response. This issue has also been addressed throughout the content section of the syllabus and by producing additional information on page 11 in relation to the purpose of the Engineering Report.*

3.1.6 Outcomes

3.1.6a Preliminary course outcomes

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
8	8	22	4	3	1
17.4%	17.4%	48%	9%	7%	2.2%

3.1.6b HSC course outcomes

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
8	8	22	5	2	1
17.4%	17.4%	48%	10.8%	4.3%	2.2%

*The relatively high response to the “unsure” and “disagree” categories in 3.1.6a and 3.1.6b can be attributed to respondents who indicated that outcomes would need to reflect changes in course objectives. This issue was also addressed in the modifications made by the expert reference group.*

3.1.7 Content

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
11	4	15	8	5	3
24%	9%	33%	17.4%	10.8%	7%

*The relatively high response to the “unsure” and “disagree” categories can be attributed to concerns relating to issues regarding the lack of specification of the depth of study required, the breadth of the content and the depth required with the Engineering Report. Throughout the content section, the depth of study is specified with regard to “learn about” and “learn to” expectations. This specification of depth of study should indicate to teachers that the breadth of study would be compatible with the indicative hours of the course.*

*With regard to the Engineering report, again clear specification of the requirements as detailed earlier provide guidelines to indicate that these tasks are within the bounds of the indicative course hours.*

3.1.8 Course Requirements

Nil Response	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
10	12	19	4	0	1
22%	26.1%	41.3%	9%	0%	2.2%

*The responses to the “unsure” category can be attributed to respondents who considered that the breadth of the content was too great. This has been addressed throughout the content section of the syllabus by clarifying the required depth of study of topics in each module.*

**3.1.9 Assessment Components, Weightings and Tasks**

<b>Nil Response</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>13</b>	<b>3</b>	<b>10</b>	<b>8</b>	<b>7</b>	<b>5</b>
<b>28.3%</b>	<b>7%</b>	<b>22%</b>	<b>17.4%</b>	<b>15.2%</b>	<b>10.8%</b>

*The response rate to the “unsure” and “disagree” category can be attributed to respondents who indicated a need to rationalise the breakdown of assessment material in relation to the objectives of the course. Furthermore, anomalies were noted regarding the separate assessment of “Engineering Reports” as well as “Communications”. It has generally been recognised that the engineering reports do constitute a method of communication and therefore cannot be assessed twice. These issues have been addressed on pages 50,51 and 53.*

**3.1.10 Engineering Studies Stage 6 HSC Examination Specifications**

<b>Nil Response</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>13</b>	<b>3</b>	<b>10</b>	<b>8</b>	<b>7</b>	<b>5</b>
<b>28.3%</b>	<b>7%</b>	<b>22%</b>	<b>17.4%</b>	<b>15.2%</b>	<b>10.8%</b>

*The response rate to the “unsure”, “disagree” and “strongly disagree” categories can be attributed to respondents who identified that errors existed in relation to the numbering of the paper sections and that an error was made in the specification of the number of questions that needed to be attempted by students in Section II of the paper. These issues have been addressed.*

**3.1.11 Post-School Opportunities**

**3.1.11a Links between courses and training packages**

<b>Nil Response</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>9</b>	<b>7</b>	<b>18</b>	<b>6</b>	<b>5</b>	<b>1</b>
<b>20%</b>	<b>15.2%</b>	<b>39.1%</b>	<b>13%</b>	<b>10.8%</b>	<b>2.2%</b>

*The relatively high response rate to the “unsure”, “disagree” and “strongly disagree” categories can be attributed to respondents who commented on the lack of clarity of the text and the confusion created by the inclusion of Figure 1 (page 57) and the lack of value of the table included on page 58. Many respondents expressed a desire to have meaningful information on credit transfer provided. This issue has been addressed, as credit transfer will be detailed in a separate credit transfer guide.*

**3.1.11b Links between courses and VET opportunities**

<b>Nil Response</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>12</b>	<b>6</b>	<b>14</b>	<b>9</b>	<b>4</b>	<b>1</b>
<b>26.1%</b>	<b>13%</b>	<b>30.4%</b>	<b>20%</b>	<b>9%</b>	<b>2.2%</b>

*The relatively high response rate to the “unsure”, “disagree” and “strongly disagree” categories can be attributed to respondents who indicated a need for clear specification of credit transfer as referred to above. This issue will be addressed in the separate credit transfer guide.*

**3.1.13 Engineering Studies Stage 6 Sample HSC Assessment Items**

<b>Nil Response</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>10</b>	<b>3</b>	<b>12</b>	<b>5</b>	<b>13</b>	<b>3</b>
<b>22%</b>	<b>7%</b>	<b>26.1%</b>	<b>10.8%</b>	<b>28.3%</b>	<b>7%</b>

*The response rate to the “unsure”, “disagree” and “strongly disagree” categories can be attributed to respondents who indicated that the sample assessment items did not reflect the entirety of the course content nor indicate the depth of study required. Also, some sample questions were missing graphical information that made their interpretation difficult. This issue has been addressed by the development of a complete sample examination paper based on questions covering specified outcomes.*

**3.1.14 Engineering Studies Stage 6 Draft Performance Bands**

<b>Nil Response</b>	<b>Strongly Agree</b>	<b>Agree</b>	<b>Unsure</b>	<b>Disagree</b>	<b>Strongly Disagree</b>
<b>9</b>	<b>2</b>	<b>16</b>	<b>10</b>	<b>4</b>	<b>5</b>
<b>20%</b>	<b>4.3%</b>	<b>35%</b>	<b>22%</b>	<b>9%</b>	<b>10.8%</b>

*The relatively high response rate to the “unsure”, “disagree” and “strongly disagree” can be contributed to the respondents who indicated a lack of clarity in the descriptors and that descriptors relating to specific content were not consistently indicated throughout the bands. These have been revised to provide clarity.*

**3.1.15 Overall Evaluation**

<b>Nil Response</b>	<b>Excellent as is</b>	<b>Good, with fine-tuning</b>	<b>Acceptable with re-working</b>	<b>Unsure</b>	<b>Unsatisfactory in issues treatment</b>
<b>8</b>	<b>1</b>	<b>11</b>	<b>17</b>	<b>5</b>	<b>4</b>
<b>17.4%</b>	<b>2.2%</b>	<b>24%</b>	<b>40%</b>	<b>10.8%</b>	<b>9%</b>

*The relatively high response rate to the “acceptable with reworking”, “unsure” and “unsatisfactory in the treatment of issues” can be contributed to the respondents who expressed concerns regarding the breadth of content specified in the content without a specification of the depth of treatment required. Also, concerns were indicated in relation to the intent and depth of the reports that are required for each module of work. These issues have been addressed throughout the syllabus document and the need for support material has been noted. The revision of performance band descriptors is a further issue that has been undertaken to ensure a greater acceptance of the syllabus.*



3.2 Issues Raised and Writing Team Action

Syllabus Item	Issues	Source/s	Action
<b>Engineering Studies</b> in Stage 6 Curriculum	<ul style="list-style-type: none"> <li>Editing of text to remove repetitive phrase and improve clarity</li> </ul>	DET	Agree. Repetition removed from page 6.
	<ul style="list-style-type: none"> <li>Address gender imbalance issues in rationale</li> </ul>	DET	Agree. Reference to opportunities for all people to participate in the profession has been included. Page 6.
	<ul style="list-style-type: none"> <li>Text too global to provide real insight to the course.</li> </ul>	Harry Taylor	Disagree. Majority of responses indicate adequate treatment of the rationale for the subject.
	<ul style="list-style-type: none"> <li>Generally clear indication of subject intent.</li> </ul>	Manufacturing BCC OTEN	Agree. The majority of responses agree on this point.
	<ul style="list-style-type: none"> <li>Modification of text to delete reference to positive outcomes.</li> </ul>	DET	Agree. Sentence removed. P.6.
Pathways for <b>Engineering Studies</b> Stage 6 Students	<ul style="list-style-type: none"> <li>Well received and clearly indicates pathways</li> </ul>	Harry Taylor Uni & Industry Consultation	Agree. Minor changes have been made to add further clarity.
	<ul style="list-style-type: none"> <li>Stage 5 box indicates</li> </ul>	Jon Hinde.	Agree. Change Industrial

	<p>Technological elective courses that provide relevant experiences for Industrial Technology.</p> <ul style="list-style-type: none"> <li>• Specific technics subjects need to be individually mentioned in the table relating to Stage 5.</li> <li>• Specification of pathways beyond stage 6 would be beneficial.</li> <li>• Changes to ensure consistency with other syllabuses</li> </ul>	<p>OTEN</p> <p>Craig Williams</p> <p>St. Ives High School</p> <p>Manufacturing BCC DET</p>	<p>Technology reference to Engineering Studies. Page 7.</p> <p>Disagree. Information is to be included in same format as other syllabus documents.</p> <p>As now, Credit transfer will be addressed in the TAFE/HSC Credit Transfer Guide.</p> <p>Agree. Minor changes have been made to the diagram for consistency. Page 7.</p>
Aim	<ul style="list-style-type: none"> <li>• Provide students a sound basis to study engineering concepts.</li> <li>• The emphasis statement provides informative instruction</li> <li>• Modifications required to address concerns with expression of aim</li> </ul>	<p>Uni and Industry Consultation. University of New England</p> <p>Harry Taylor</p> <p>Manufacturing BCC St, Ives High</p>	<p>Noted.</p> <p>Agree. The intent of the aim has been maintained</p> <p>Agree. Minor changes undertaken to provide clarity of expression.</p>

	statement	Catholic Education Commission	Page 8.
Objectives	<ul style="list-style-type: none"> <li>An excellent summary of what an engineering course should provide.</li> <li>Changes to the wording of the objectives is required</li> <li>Ambitious in terms of depth material to be covered.</li> </ul>	<p>Harry Taylor</p> <p>Manufacturing BCC Jon Hinde Catholic Education Commission DET</p> <p>Uni &amp; Industry Consultation.</p>	<p>Noted.</p> <p>Agree. An expert reference group meeting suggested alterations, which have been, included. Page 8.</p> <p>Disagree. The statements are in relation to skills, knowledge and values that are covered in the course. The objectives also act as “organisers” for outcomes.</p>
Course Structure	<ul style="list-style-type: none"> <li>Preliminary and HSC headings need to include phrase “120 indicative hours” on diagrams.</li> <li>Inclusion of modules such as Bio-engineering is too</li> </ul>	<p>DET</p> <p>St. Dominic’s College</p>	<p>Agree. Diagram amended page 9.</p> <p>Disagree. Bio-engineering is a major field of study in</p>

	<p>specialised. More common concepts should be selected.</p> <ul style="list-style-type: none"> <li>The terms Core, Elective, Application, Product, System, Focus is confusing and tends to overlap in meaning. Some confusion in the course structure</li> <li>Order of teaching modules needs specifications.</li> <li>Include Manufacturing Engineering in the engineering fields on page 10.</li> <li>Equitable time for Preliminary</li> </ul>	<p>John Reardon St. Ives High U.N.E. Catholic Education Commission OTEN DET</p> <p>Peter Sipple</p> <p>University and Industry Consultation U.N.E.</p> <p>Kingscliff High</p>	<p>engineering. It is important for students to gain an understanding of a range of gender inclusive modules.</p> <p>Agreed. References have been revised for clarity including the <i>removal of tables in draft syllabus on pages 19 and 20</i>. Removal of reference to product, system, core on page 9. Clarity to the purpose of focus modules is included on pages 24 and 39</p> <p>The order of modules is indicated in the syllabus. The intention is that they are taught in this order apart from the elective module. Details for the presentation of this module are outlined in the course requirements on page 45.</p> <p>Agree. Addition included. Page 10</p> <p>Disagree. Indicative hours for Stage 6 courses are generally</p>
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	<p>Course of 3 terms and HSC Course of 4 Terms is a concern when the same number of modules need to be covered.</p> <ul style="list-style-type: none"> <li>Terminology in section 2.6.5 regarding working with others in teams and using Information Technology p 14.</li> <li>Clarification of the requirements of the Engineering Report. Page 10.</li> <li>Clarification of the number of engineering focus modules to</li> </ul>	<p>OTEN A Auchterlowie</p> <p>Catholic Education Commission Rod Nesbitt OTEN Corpus Christi College DET</p> <p>Institute of Technology Education</p>	<p>120 hours Preliminary and 120 hours HSC. School should ensure that this occurs. Indicated page 10.</p> <p>It has been noted that 'working with others and in teams' is a key competency statement. Change of Using Information Technology to Using Technology – a key competency, p14.</p> <p>Agree. Details of the depth of study and the type of report have been clarified in each module. Examples are found on pages 17, 20 and 23. Overall statement of purpose of the Engineering Report has further been clarified on page 11.</p> <p>Agree. This has been clarified on pages 9 and 10.</p>
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	be studied.	OTEN Manufacturing Technologies BCC St. Ives High DET	
Outcomes	<ul style="list-style-type: none"> <li>• Outcomes P5.1 and P5.3 not directly related to content section</li> <li>• More prescription required ensuring quality assessment.</li> <li>• Link well with objectives.</li> </ul>	<p>DET</p> <p>Harry Taylor Manufacturing BCC DET</p> <p>Peter Sipple Catholic Education Commission Rod Nesbitt OTEN</p>	<p>Agree. This issue has been addressed in each relevant module in line with the revision of outcome statements.</p> <p>Agree. This has been addressed in the syllabus. A meeting of writers and the reference group meeting addressed this issue and outcomes statements have been revised on p12 and 13.</p> <p>Agree. Links maintained and strengthened in the syllabus.</p>
Content	<ul style="list-style-type: none"> <li>• Bernoulli's law not applicable to lifting devices</li> </ul>	St. Dominic's College Kingswood. Uni and Industry	Agree. Has been removed from lifting devices and included in aeronautical engineering on page

	<ul style="list-style-type: none"> <li>• Conditions of non- coplanar force to read conditions of concurrent non-coplanar forces (p37).</li> <li>• Relocation, addition and deletion of minor content areas throughout modules to ensure greater relevancy to modules and reduce content duplication.</li> <li>• Add Pneumatics as a possible topic</li> <li>• Truss analysis has not been included in the content of the syllabus. It is recognised as an</li> </ul>	<p>Consultation</p> <p>St. Dominic's College Kingswood</p> <p>St. Dominic's College St. Francis Xavier David Chapple</p> <p>St. Dominic's College Kingswood</p> <p>Rod Nesbitt</p>	<p>40. This is consistent with other responses that indicated that content is more appropriate in specific modules,</p> <p>Agree. This modification has been made. Page 37.</p> <p>Agree. Some minor changes have been made in relation to the deletion and inclusion of small amounts of content in various modules as appropriate. Changes made throughout the document.</p> <p>Disagree. Many responses indicated that content is already excessive and introductory concepts relating to hydraulics also relate to pneumatics. No significant benefit would be achieved by this addition. Agree. This content has been include on page 31</p>
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	<p>important concept in analysing structures and should be included in the content relating to civil structures.</p> <ul style="list-style-type: none"> <li>• Need to specify depth of content for many modules and possible reduction in the number of course modules.</li> <li>• Too much content in the course requirements to allow any more than a superficial coverage of content</li> <li>• Changes are required to the introductory wording of modules to indicate that the probability of</li> </ul>	<p>DET Institute of Technology Education. 17 schools and individuals</p> <p>Catholic Education. Commission Uni &amp; Industry Consultation OTEN 11 schools and individuals</p> <p>Expert Reference Group</p>	<p>Agree. Indication of student knowledge of content has been specified in 'students learn about' and 'learn to' columns. This is addressed throughout the syllabus content and addresses the need for a reduction in the number of modules studied.</p> <p>Agree. Specification of Depth of study indicated in syllabus content is essential in order to provide effective coverage of content. This is addressed throughout the content in order to clarify required depth of study.</p> <p>Agree. The introductory wording for each module where various examples are indicated is changed to "select one or more"</p>
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	<p>delivering all content in relation to a single specified example is unlikely.</p> <ul style="list-style-type: none"> <li>• Engineering Report needs more specific guidelines.</li> <li>• Engineering report to be viewed as a part of communication not a separate entity</li> <li>• Engineering Focus Area Modules should emphasise the scope of the profession in</li> </ul>	<p>Harry Taylor Kingscliff High David Chapple Catholic Education Commission Rod Nesbitt</p> <p>Uni &amp; Industry Consultation OTEN</p> <p>Uni &amp; Industry Consultation</p>	<p>Examples of pages include 15, 18 and 21.</p> <p>Agree. This has been addressed on page 11 where the explanation of the purpose of the report has been specified. Also specific Engineering Report expectations are out line for each module on pages 17,20,23,26,29,31,35,38,41 and 44.</p> <p>Agree. This has been addressed in the syllabus by formatting it under communication and including specification in 'learn to' section in each module (example see pages 17 &amp;20).</p> <p>Agree. This has been addressed by indicating that the scope of the</p>
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	<p>the treatment of module content</p> <ul style="list-style-type: none"> <li>• Application module Brakes to be renamed Braking Systems</li> <li>• Include basic Hydraulics in relation to braking systems</li> <li>• Expand content related to Hydraulics</li> <li>• Heat Treatment of steels phase diagrams needs to be included with respect to heat treatment.</li> </ul>	<p>Uni &amp; Industry Consultation Corpus Christi College</p> <p>Uni &amp; Industry Consultation Corpus Christi College</p> <p>Institute of Engineers</p> <p>Uni &amp; Industry Consultation</p>	<p>profession is the initial area shown in the content of focus modules. Pages 25,40 and 43.</p> <p>Agree. This change is consistent with the naming of application modules. Pages 9 and 21.</p> <p>Agree. This is a logical module for inclusion of basic concepts relating to hydraulics. It is an important concept and supports learning in the focus application. Page 22.</p> <p>Noted. This has been marginally increased and included in braking systems as it is an integral part of the application. Page 22.</p> <p>Disagree. This additional Content is not essential for</p>
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	<ul style="list-style-type: none"> <li>• New syllabus areas will require the provision of resources and training for teachers</li> <li>• Amendments to headings and formatting of content. Simplification required.</li> <li>• Specification of outcomes for School-based Elective modules</li> <li>• Content editing and clarity and mapping of content to ensure suitable breadth of study.</li> </ul>	<p>Kingscliff High Craig Williams St. Ives High And others.</p> <p>Catholic Education Commission DET 4 schools</p> <p>DET</p> <p>Manufacturing BCC</p>	<p>coverage of the topic. This is not an essential inclusion to ensure clarity in the learning of heat treatment concepts.</p> <p>Preparation of support documents will assist teachers to prepare for and program the subject</p> <p>Agree. This has been addressed throughout the syllabus. Changes to pages 15, 18, 21, 24 and 30.</p> <p>Agree. The outcomes and content for the elective module have been clarified. Pages 27-29.</p> <p>Agree. Changes have been made throughout to syllabus</p>
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			documents in line with BCC and other consultation responses.
Course Requirements	<ul style="list-style-type: none"> <li>Preliminary course should be one module less</li> <li>Ten reports are too many given the assessment weighting.</li> <li>Positive response</li> </ul>	<p>Peter Sipple</p> <p>Craig Williams</p> <p>Jon Hinde Manufacturing BCC</p>	<p>Disagree. The number of modules allows breadth of study of content in relation to a wider range of engineering applications and focus modules. Specification of depth of study requirements rationalisation of breadth of study has reduced perceived content load.</p> <p>Disagree. The depth of study and focus of each report has been included. (page 11) The scope of reports is inclusive of other areas of content in the syllabus.</p> <p>Noted.</p>
Assessment components, weightings and tasks	<ul style="list-style-type: none"> <li>Adjustment to value of various assessment components.</li> <li>Assessment guidelines are structured according to topics</li> </ul>	<p>Craig Williams</p> <p>DET Manufacturing BCC</p>	<p>Disagree. Majority of responses did not support this view.</p> <p>Agree. Rationalisation of tables and qualifying information on</p>

	<p>which differentiate between content and engineering reports. This is misleading, as reports are part of content (p50 and 51).</p> <ul style="list-style-type: none"> <li>• Introductory stem for HSC content is required.</li> <li>• Engineering Report assessment weighting to be reduced.</li> <li>• Weighting of 75% and 65 % for preliminary and HSC</li> </ul>	<p>Rod Nesbitt</p> <p>Catholic Education Commission</p> <p>Harry Taylor Warren McGuire Pennant Hills High Corpus Christi College</p> <p>John Reardon</p>	<p>page 50 and 51 has been addressed to include weighting of assessable components of the course. It is recognised that Engineering Reports are a form of communication.</p> <p>Disagree. Many responses suggest a reduction in content. The content covered in the preliminary year is sufficient as an introduction to the HSC year. No other responses to support this view.</p> <p>Disagree. Not supported by the majority of responses. The weighting of the Engineering Report for both the Preliminary and HSC course is indicative of the content area that the Engineering Reports may be used to cover. This is addressed throughout the content area e.g. pages 38 and 44.</p> <p>Disagree. Weightings of assessment are clearly indicated.</p>
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	module content could cause confusion		Page 53.
<b>Engineering Studies Stage 6 HSC Examination Specifications</b>	<ul style="list-style-type: none"> <li>• Three sections only in examination paper.</li> </ul>	Harry Taylor St. Ives High Institute of Technology Education Rod Nesbitt	Agree. Changes made. Page 52
	<ul style="list-style-type: none"> <li>• Deletion of Section I multiple choice questions on the basis they do not provide a sound basis for discriminating between the quality of candidates.</li> </ul>	Corpus Christi College David Chapple Craig Williams A.Aucherlowie	Disagree. Multiple choice is a valid assessment method and will ensure reliable testing of candidates' knowledge.
	<ul style="list-style-type: none"> <li>• The terms "Engineering Applications " and "Systems" are used without being adequately defined in the document</li> </ul>	St. Ives High School	Clarification of an application module has been provided on page 10. This is consistent throughout the document. Reference to 'systems' in relation to application modules has been deleted for clarity on page 52.
	<ul style="list-style-type: none"> <li>• Details of examination format incorrect and misleading</li> </ul>	St. Francis Xavier Manufacturing BCC Peter Sipple	Agreed. Examination format has been revised in consultation with expert reviewers of the draft

	<ul style="list-style-type: none"> <li>• Too much emphasis given to societal and historical issues and scope of the profession</li> </ul>	<p>Kingscliff High Catholic Education Commission</p> <p>St. Ives High School M Shiner / W Wilks</p>	<p>document. This has addressed concerns in relation to the details of the examination format.</p> <p>Disagree. Historical and societal issues and the Scope of the profession are prescribed areas of content. The questions in the specified examination clearly indicates the value of assessment devoted to these areas.</p>
Post-School Opportunities	<ul style="list-style-type: none"> <li>• Students and parents require clear and detailed credit transfer information</li> <li>• Modifications to text and table are required to provide clarity.</li> </ul>	<p>Craig Williams St. Ives High School Harry Taylor</p> <p>John Hinde St. Ives High School DET</p>	<p>Agreed. As now, Credit transfer will be detailed in a separate credit transfer guide.</p> <p>Agree. Changes made to ensure use of standard text in syllabus documents. Page 46.</p>
<b>Engineering Studies</b> Stage 6 Sample HSC Assessment	<ul style="list-style-type: none"> <li>• Sample questions are not representative of the entire syllabus content. They focus more on the qualitative</li> </ul>	<p>John Reardon Craig Williams St. Ives High School. Harry Taylor</p>	<p>Agree. Additional sample questions covering a broad range of outcomes and bands are to be prepared for the sample</p>

Items	<p>aspects of the content.</p> <ul style="list-style-type: none"> <li>Missing diagrams are required so as the question types can be adequately evaluated.</li> <li>Weighting on Engineering Report is too great</li> </ul>	<p>Peter Sipple UNE David Chapple M. Forester</p> <p>St.Ives High School</p> <p>Pennant Hills High A.Auchterlowie Corpus Christi College</p>	<p>examination paper which is being developed for the syllabus package.</p> <p>Agree. The sample examination paper will include all diagrams.</p> <p>Disagree. Not supported by the majority of responses. The development of Engineering Reports are in relation to many aspects of the content as is detailed throughout the document.</p>
<b>Engineering Studies</b> Stage 6 Draft Performance Bands	Increased clarity of performance bands is required to ensure that students can be placed in bands with confidence.	<p>DET Jon Hinde St. Dom's College Craig Williams St. Ives High School Manufacturing BCC Many others</p>	Agree. Band descriptors have been revised for clarity of outcome statements and course content. Further refinement will occur.
Overall Evaluation	<ul style="list-style-type: none"> <li>Revision of content brings syllabus up to date.</li> </ul>	<p>Harry Taylor Institute of Engineers Pennant Hills High</p>	Agree. Content is relevant to present Engineering Studies.

	<ul style="list-style-type: none"> <li>• Content of syllabus lacks the necessary indication of depth of study.</li> <li>• Amount of syllabus content is too extensive to cover to a meaningful depth.</li> <li>• Too many modules to be covered in the course.</li> <li>• Clarification of Engineering Report requirements.</li> </ul>	<p>Rod Nesbitt Manufacturing Technologies BCC 6 Schools</p> <p>Uni. &amp; Industry Consultation Institute of Technology Education 5 schools</p> <p>Peter Sipple Avondale College Warren McGuire Corpus Christi College OTEN Gosford Waratah Paul Stewart Dave Allen Avondale College Whitebridge High Institute of Technology</p>	<p>Agree. Depth of study of content has been clarified in each module in the students “learn about” and “learn to” columns.</p> <p>Disagree. Specification of depth of study is indicated in relation to the content in each module.</p> <p>Disagree. The number of modules allows breadth of study of content in application and focus modules. Revision of depth of study and breadth of study requirement in each module ensures consistency with suggested module time. Addressed throughout content section.</p> <p>Agree. Additional information on report requirements has been included in each module. An example is found on page 23.</p>
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	<ul style="list-style-type: none"> <li>• Sample assessment questions need to reflect the complete course content as well as the depth of study required.</li> <li>• Suitable support materials need to be developed, especially for the content not covered in the Engineering Science Syllabus.</li> <li>• Existing Engineering Science course is more relevant</li> </ul>	<p>Education Manufacturing Technologies BCC OTEN</p> <p>Harry Taylor Peter Sipple A Auchterlowie 3 Schools</p> <p>Institute of Engineers Australia Institute of Technology Education 10 Schools</p> <p>A Auchterlowie</p>	<p>Further clarification of the Engineering Report requirements is specified on p11.</p> <p>Agree. A complete HSC sample examination will be prepared to reflect the complete course content in the specified examination format.</p> <p>Agree. Support documentation is being developed.</p> <p>Disagree. The evaluation of Engineering Science and the consultation response to the Writing Brief have guided the development of Engineering Studies.</p>
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#### 4. Responses

Written responses were received from the following individuals and groups:

##### Individuals

Name	School / Group
Harry Taylor	Trinity Grammar School
David Chapple	Caringbah High School
Steve Russell	Liverpool Girls High School
Malcolm Forester	Freeman Catholic High School
Jon Hinde	Macquarie Boys' Technology High School
Peter Miniutti	Penshurst Girls' High School
John Reardon	Galston High School
TAS Faculty	St. Dominic's College, Kingswood
Peter Sipple	Belmont Languages High School
Eng Science Teachers	Kingscliff High School
Phillip Turner	Glendale Technology High School
G.Wise	McCarthy C. C.
Craig Williams	Epping Boys High School
IA Staff	St Ives High School
Avondale College	Avondale College
M Shiner/ W Wilks	Taree High School
IA Faculty	Whitebridge High School
Gary Stubbs	East Hills Boys High
John Reddington	Hurlstone Agricultural High School
Thomas Brown	OTEN
Bruce O'Donnell	Merewether High School
	Gosford High School
Kempsey High IA	Kempsey High School
Paul Stewart	Glendale Technology High School
Albury High ES Teachers	Albury High School
Brian Barter	Toongabbie Christian School
Brian Cox	John Therry Catholic High School
Dennis J Moroney	Merewether High School
J Smytheman, A Cleaton	Heathcote High School
Waratah IA Teachers	Waratah Technology High School
Dave Allen	Condell Park High School
UNE	Uni of New England -
Pennant Hills High	Pennant Hills High School
TAS Faculty	St. Francis Xavier's College
Rod Nesbitt	Girraween High School
A.L. Auchterlowie	East Hills Boys High
John Rotchford	Corpus Christi College
Warren McGuire	Swansea High School
George Gazy/Phil Steel	Sydney Secondary Distance Education

**Groups**

<b>Group</b>
<b>Uni and Industry</b>
<b>OTEN - LMPC</b>
<b>Department of Education</b>
<b>Catholic Education Commission</b>
<b>Manufacturing BCC</b>
<b>Institute of Technology Education</b>
<b>AHISA</b>
<b>Institution of Engineers</b>
<b>University of New England – Environmental Engineering</b>