



Assessment and Reporting in Engineering Studies Stage 6

Effective from	2010 (Preliminary and HSC courses)
Date published	June 2009

This document contains the Board of Studies' requirements for assessing and reporting achievement in the Preliminary and HSC courses in Engineering Studies for the Higher School Certificate, and provides details of the HSC examination in this course. From time to time changes are made to HSC assessment and examination requirements. Such changes will be made available through updates to this document. Please note that the version on the Board of Studies website is always the current version.

© 2009 Copyright Board of Studies NSW for and on behalf of the Crown in right of the State of New South Wales.

This document contains Material prepared by the Board of Studies NSW for and on behalf of the State of New South Wales. The Material is protected by Crown copyright.

All rights reserved. No part of the Material may be reproduced in Australia or in any other country by any process, electronic or otherwise, in any material form or transmitted to any other person or stored electronically in any form without the prior written permission of the Board of Studies NSW, except as permitted by the *Copyright Act 1968*. School students in NSW and teachers in schools in NSW may copy reasonable portions of the Material for the purposes of bona fide research or study.

When you access the Material you agree:

- to use the Material for information purposes only
- to reproduce a single copy for personal bona fide study use only and not to reproduce any major extract or the entire Material without the prior permission of the Board of Studies NSW
- to acknowledge that the Material is provided by the Board of Studies NSW
- not to make any charge for providing the Material or any part of the Material to another person or in any way make commercial use of the Material without the prior written consent of the Board of Studies NSW and payment of the appropriate copyright fee
- to include this copyright notice in any copy made
- not to modify the Material or any part of the Material without the express prior written permission of the Board of Studies NSW.

The Material may contain third-party copyright materials such as photos, diagrams, quotations, cartoons and artworks. These materials are protected by Australian and international copyright laws and may not be reproduced or transmitted in any format without the copyright owner's specific permission. Unauthorised reproduction, transmission or commercial use of such copyright materials may result in prosecution.

The Board of Studies has made all reasonable attempts to locate owners of third-party copyright material and invites anyone from whom permission has not been sought to contact the Copyright Officer, ph (02) 9367 8289, fax (02) 9279 1482.

Published by Board of Studies NSW
GPO Box 5300
Sydney 2001
Australia

Tel: (02) 9367 8111
Fax: (02) 9367 8484
Internet: www.boardofstudies.nsw.edu.au

2009284

Contents

Assessment in Stage 6

Reporting achievement at the HSC

Internal assessment

The HSC examination

Board requirements for the HSC internal assessment mark

Engineering Studies HSC examination specifications

Summary of external and internal HSC assessment

Resources and advice

Assessment in Stage 6

Assessment is the process of gathering information and making judgements about student achievement for a variety of purposes. In the Preliminary and HSC courses those purposes include:

- assisting student learning
- evaluating and improving teaching and learning programs
- providing evidence of satisfactory achievement and completion in the Preliminary course
- providing the Higher School Certificate results.

Assessment for Learning provides a useful approach for the delivery of the Engineering Studies Preliminary and HSC courses. It provides opportunities in the context of everyday class activities for students to demonstrate their learning.

The approach is most effective when students:

- are involved in setting learning goals
- know and understand standards and expectations about what is expected and the standards of work
- receive feedback that helps them understand the next steps in their learning and plan how to undertake the next steps.

Reporting achievement at the HSC

The Higher School Certificate credentials received by students are used by the Board to report both the internal and external measures of achievement. Higher School Certificate results in Engineering Studies comprise:

- **an assessment mark** derived from the mark submitted by the school and produced in accordance with the Board's requirements for the internal assessment program
- **an examination mark** derived from the HSC external examination
- **an HSC mark**, which is the average of the assessment mark and the examination mark
- **a performance band**, determined by the HSC mark.

Student performance in an HSC course is reported against standards on a course report. The course report contains a performance scale for the course describing levels (bands) of achievement, an HSC mark located on the performance scale, an assessment mark and an

examination mark. The course report also shows, graphically, the statewide distribution of HSC marks of all students in the course.

The distribution of marks is determined by students' performances against the standards and not scaled to a predetermined pattern of marks.

The use of both internal assessment and external examinations of student achievement allows measurements and observations to be made at several points and in different ways throughout the HSC course. Taken together, the external examination and internal assessment provide a valid and reliable assessment of the achievement of the knowledge, understanding and skills described for each course.

The Board of Studies uses a standards-referenced approach to reporting student achievement in the Higher School Certificate. The standards in the HSC are:

- the knowledge, skills and understanding expected to be learnt by students – the syllabus standards
- the levels of achievement of the knowledge, skills and understanding – the performance standards.

Both the syllabus standards and the performance standards are based on the aims, objectives, outcomes and content of the course. Together they specify what is to be learnt and how well it is to be achieved. Teacher understanding of the standards comes from the aims, objectives, outcomes and content in the syllabus together with:

- the performance descriptions that summarise the different levels of performance
- HSC examination papers and marking guidelines
- samples of students' achievement, collected in the standards packages and published on the Board's Assessment Resource Centre website.

Internal assessment

This section should be read in conjunction with advice on internal assessment in the Board's [Assessment Certification and Examination \(ACE\) Manual](#).

Preliminary course

The suggested components and weightings are designed to give guidance for the school's assessment of student achievement in the Preliminary course. They may be varied to suit school needs.

HSC course

The Board requires schools to submit an assessment mark for each HSC candidate in Engineering Studies. The internal assessment mark submitted by the school provides a summation of each student's achievements measured at several points throughout the course. The marks submitted for each course group at a school should reflect the rank order of students, and must be on a scale sufficiently wide to reflect adequately the relative differences in student performances.

Internal assessment provides a measure of a student's achievement based on a wider range of syllabus content and outcomes than may be covered by the external examination alone. The assessment components and weightings to be applied ensure a common focus for internal

assessment in the course across schools, while allowing for flexibility in the design of tasks. A variety of types of task should be used to give students the opportunity to demonstrate outcomes in different ways and to improve the validity and reliability of the assessment.

The standards-referenced approach to assessment for the HSC involves schools ensuring that:

- assessment tasks reflect the weightings and components specified in this document
- tasks are designed to focus on objectives and outcomes
- the types of assessment task are appropriate for the outcomes being assessed
- students are given the opportunity to demonstrate their level of achievement of the outcomes in a range of different task types
- the assessment criteria for each task are such that higher marks are gained by demonstration of better achievement in relation to the syllabus outcomes
- students know the assessment criteria before they begin a task
- marks earned on individual tasks are expressed on a scale sufficiently wide to reflect the relative differences in student performances.

Students should receive meaningful feedback about what they are able to do, and what they need to do in order to improve their level of performance.

The HSC examination

The external HSC examination provides a measure of student achievement in a range of syllabus outcomes that can be reliably measured in an examination setting. The external examination and its marking relate to syllabus standards by:

- providing clear links to syllabus outcomes
- enabling students to demonstrate the levels of achievement outlined in the course performance scale
- applying marking guidelines based on criteria that relate to the quality of the response
- aligning performance in the examination each year to the standards established for the course.

Board requirements for the HSC internal assessment mark

The Board requires that the assessment tasks used to determine the HSC internal assessment mark must comply with the components and weightings specified. The collection of information for the HSC internal assessment mark must not begin before the completion of the Preliminary course.

Schools are required to develop an HSC internal assessment program that:

- specifies the various assessment tasks and the weightings allocated to each task
- provides a schedule of the tasks designed for the whole course.

Note that school-based assessment marks submitted to the Board must NOT include:

- measures of objectives and outcomes that address values and attitudes. (However, as these objectives are important elements of any course, schools may decide to report on them separately to students and parents, perhaps using some form of descriptive statements.)
- measures that reflect student conduct.

See the Board's [ACE Manual](#) for further information.

Assessment components and weightings

Preliminary course

The suggested components and weightings for the Preliminary course are set out below.

Component	Weighting
Scope of the profession	10
Knowledge of engineering principles	40
Communication skills	20
Understanding the impacts of engineering	10
Management and problem-solving	10
The application of engineering methodology	10
	100

Engineering Reports should be allocated 25% of the total school assessment based on the range of assessment components.

HSC course

The mandatory components and weightings for the HSC course are set out below. The internal assessment mark submitted to the Board of Studies is to be based on the HSC course only.

Component	Weighting
Scope of the profession	20
Knowledge of engineering principles	40
Communication skills	10
Understanding the impacts of engineering	10
Management and problem-solving	10
The application of engineering methodology	10
	100

Engineering Reports must be allocated 35% of the total school assessment based on the range of assessment components.

Engineering Studies HSC examination specifications

The examination will consist of a written paper worth 100 marks.

Time allowed: 3 hours plus 5 minutes reading time.

The paper will include a formulae sheet.

The paper will consist of three sections.

Section I – Application modules (10 marks)

- There will be objective response questions to the value of 10 marks.

Section II – Application and focus modules (70 marks)

- There will be six questions.
- Each question will consist of short-answer parts.
- There will be one question, worth 10 marks, based on historical and societal influences and the scope of the profession.
- There will be three questions, worth 10 marks each, based on the application modules.
- There will be two questions, worth 15 marks each, based on the focus modules.
- There will be approximately 30 parts in total.
- At least two parts will be worth from 4 to 6 marks.

Section III – Engineering and the Engineering Report (20 marks)

- There will be two questions, worth 10 marks each.
- Each question will consist of approximately 4 short-answer parts.

Summary of external and internal HSC assessment

External examination	Mark	Internal assessment	Weighting
<i>Section I – Application modules</i> Objective response questions	10	Scope of the profession	20
<i>Section II – Application and focus modules</i> Short-answer questions	70	Knowledge of engineering principles	40
<i>Section II – Engineering and the Engineering Report</i> Short-answer questions	20	Communication skills	10
	100	Understanding the impacts of engineering	10
		Management and problem-solving	10
		The application of engineering methodology	10
			100

Resources and advice

Further guidance and advice related to assessment and the HSC examination in Engineering Studies can be found on the Board's website at www.boardofstudies.nsw.edu.au/syllabus_hsc.