

## Engineering

### 3670 Industrial Engineering — Part-time (Old Course)

#### Bachelor of Science (Engineering) BSc(Eng)

This course is of six years' duration, and leads to the degree of Bachelor of Science (Engineering). For outline of the first four stages see the Mechanical Engineering part-time old course.

#### Stage 5

		Hours per week	
		S1	S2
5.071	Engineering Analysis	3½	3½
5.112	Mechanical Engineering Design II	3	3
5.331	Dynamics of Machines I	2	2
14.001	Introduction to Accounting A	1½	0
14.002	Introduction to Accounting B	0	1½
18.011	Industrial Engineering IA	2	2
18.021	Industrial Engineering IB	2	2
		14	14

#### Stage 6

5.042	Industrial Experience*	0	0
18.022	Industrial Engineering IIB	3	3
18.432	Design of Production Systems	6	6
18.551	Operations Research	3	3
	General Studies Elective	1½	1½
		13½	13½

\*See the introduction of School of Mechanical and Industrial Engineering.

### Industrial Engineering Technical Elective List

#### Production Engineering Technical Electives

		Hours per week	
		S1	S2
18.204	Introduction to Automation I	3	or 3
18.214	Introduction to Automation II	3	or 3
18.224	Numerical Control of Machine Tools	3	or 3
18.404	Design for Production	2	2
18.262G	Economics of Machining for Automation	3	or 3
18.371G	Factory Design and Layout	3	0

### Operations Research Technical Electives

		Hours per week	
		S1	S2
18.671G	Decision Theory	2	or 2
18.764G	Management of Distribution Systems	2	or 2
18.765G	Optimization of Networks	2	or 2
18.777G	Time Series and Forecasting	2	or 2
18.864G	Applied Geometric Programming	2	or 2
18.874G	Dynamic Programming	2	or 2
18.878G	Industrial Application of Mathematical Programming	2	or 2

Note: The graduate subjects listed are of particular interest to undergraduate students. With approval, other graduate subjects from this and other Schools may be taken.

## School of Surveying

#### Head of School

Professor P. V. Angus-Leppan

#### Administrative Officer

Mr J. V. Fonseka

The School of Surveying offers a full-time course of four year duration leading to the award of the degree of Bachelor of Surveying. Alternatively, the course may be taken in Sandwich form in which a student may, after completing the first year of the course on a full-time basis, alternate his or her studies with periods of employment by taking leaves of absence of up to two consecutive sessions at a time thereafter. The course taken in this form requires a maximum period of seven years. The part-time course is no longer available.

The Bachelor of Surveying is a well-rounded course with strong surveying base, aimed at preparing the graduate for a broad range of career opportunities, including land boundary surveying, engineering surveying, photogrammetry, cartography, mining surveying, hydrographic surveying, geodesy and geodetic surveying, computing and systems development, management and development of land, land information systems and resource assessment systems. The course recognizes the diversity of possible roles of a graduate who may be called on during his career to act as practitioner, consultant, manager, teacher or researcher.

The course has undergone comprehensive revision recently. Features of the revision include: retention of the course on a session basis for all subjects lectured within the School; integration of the sandwich course with the full-time course.

## Course Outlines

result of the more flexible University policy towards leave of absence for students; elimination of the formally assessed professional training period in the earlier course; greater numbers of technical electives in the fourth year of study; further development of the Land Studies area: land development, inventory, law, tenure, and utilization, in continuing recognition of the growing importance of this area to surveyors; development of a formal strand to improve students' written and spoken communication skills.

Throughout the course the theoretical studies are complemented by practical exercises in the field and the laboratory. Students make use of the most modern measuring instruments and computing equipment.

From 1981 onwards the School also offers a full-time course of four years' duration leading to the award of the degree of Bachelor of Surveying Science. The new course is designed to give an interested student the opportunity to obtain greater depth as an undergraduate in one or more of the several disciplines associated with surveying: land development, cartographic science, geodesy and geophysics, environmental studies, remote sensing and photogrammetry. It is so structured that:

All students must take a core consisting of 103 contact hours made up from some of the subjects of the Bachelor of Surveying course. These core subjects include the formal standards in Mathematics, Physics, Physical Geography, Surveying, written and spoken communication, and 12 hours of General Studies.

The balance, totalling 77 hours, must comprise:

at least 18 hours taken from elective subjects of the final year of the Bachelor of Surveying course;

the remainder made up from any subjects required as prerequisites for a) above and any combination of subjects offered by the University and approved by the Head of School for the individual program of study. Such approval would require that the student follow a particular sequence of subjects within a given subject area. Subjects offered by Sydney University and Macquarie University may also be taken subject to approval by the Head of School.

Resolution of class scheduling problems is the responsibility of the student.

Bachelor of Surveying students in their latter years of study may elect to transfer to the new course if they so desire.

The Bachelor of Surveying or the Bachelor of Surveying Science degree may be awarded as a Pass degree, Honours Class I, or Honours Class II in two divisions. Honours are awarded in recognition of superior performance throughout the course.

Students wishing to become Registered Surveyors after graduation are advised to gain practical experience under a registered Surveyor. Some reduction in the period of practical experience required before registration may be granted

because of practical experience gained during the University course, provided the New South Wales Surveyors' Board is informed in the prescribed manner. Details are obtainable from the Registrar, Surveyors' Board, Department of Lands, Bridge Street, Sydney 2000. The degree of Bachelor of Surveying confers exemption from all written examinations of the Surveyors' Board. In the case of the Bachelor of Surveying Science degree the New South Wales Surveyor's Board may require additional subjects for registration.

Students enrolled in either course are required to equip themselves with an electronic calculator. Details of the features required are available from the School.

### 3740 Surveying

#### Bachelor of Surveying BSurv

##### Year 1

Session 1	Hours per week
1.971 Physics I	6
5.0102 Introduction to Engineering Design	2
10.001 Mathematics I	6
29.001 Surveying I	4½
29.800 Survey Draughting	3
29.700 Professional Orientation*	1½
29.191 Survey Camp †	1½
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	24½
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\*Three half-day excursions are an essential part of this subject.

†Students are required to attend a one-week Survey Camp equivalent to 1½ class contact hours per week in each session.

##### Session 2

1.971 Physics I	6
5.030 Engineering C*	6
10.001 Mathematics I	6
29.002 Surveying II	5
29.191 Survey Camp †	1½
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	24½
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\*Introduction to Systems and Computers option.

†Students are required to attend a one-week Survey Camp equivalent to 1½ class contact hours per week in each session.

## Engineering

### Year 2

		Hpw
<i>Session 1</i>		
1.962	Physics of Measurement	3
10.022	Engineering Mathematics II (1st part)	4
10.341A	Statistics SU	2
27.295	Physical Geography for Surveyors†	4
29.003	Surveying III	5
29.151	Survey Computations I	4
29.192	Survey Camp II*	1½
		23½

\*Students are required to attend a one-week survey camp, which is equivalent to 1½ class contact hours per week in each session.  
 †One-day field tutorial is an essential part of this course

### Year 4

		Hpw
<i>Session 1</i>		
29.212	Geodesy II	3
29.312	Astronomy II	2
29.512	Photogrammetry II	3
29.653	Land Development III	3
29.704	Management I	2
29.702	Seminar II	1
	Electives*	6
29.196	Survey Camp IV**	6
		26

\*See Year 4: Electives, below.  
 \*\*Two weeks of office computations equivalent to 6 class contact hours per week

### Session 2

8.711	Engineering for Surveyors I	3
10.022	Engineering Mathematics II (2nd part)	4
10.341B	Statistics SU	2
29.004	Surveying IV	4½
29.801	Cartography I	3
29.701	Seminar I	1
29.121	Electronics for Surveyors	2
29.192	Survey Camp II*	1½
	General Studies Elective	3
		24

\*Students are required to attend a one-week survey camp, which is equivalent to 1½ class contact hours per week in each session

### Session 2

29.705	Management II	2
29.703	Seminar III	1
	Electives*	15
		18

\*See Year 4: Electives, below.

### Year 3

		Hpw
<i>Session 1</i>		
29.005	Surveying V	5
29.152	Survey Computations II	4
29.631	Land Inventory I	2
29.651	Land Development I	3
29.661	Cadastral Surveying and Land Law I	2
36.411	Town Planning	2
	General Studies Elective	3
		21

### Session 2

8.712	Engineering for Surveyors II	3
29.006	Surveying VI	3
29.211	Geodesy I	4
29.311	Astronomy I	3
29.511	Photogrammetry I	4
29.652	Land Development II	3
29.662	Cadastral Surveying and Land Law II	3
29.195	Survey Camp III**	6
		29

\*\*Students are required to attend a two-week survey camp, which is equivalent to 6 class contact hours per week

### Year 4: Electives

Total of two General Studies Advanced Electives and five technical electives in any combination which results in 6 hours for Session 1 and 15 hours for Session 2. Technical electives (of 3 hours per week each, except 29.174) are chosen from

29.031	Electronic Distance Measurement
29.032	Precise Surveying in Industry and Engineering
29.033	Characteristics of Modern Theodolites and Levels
29.034	Mine Surveying
29.035	History of Surveying
29.153	Adjustment of Control Surveys
29.161	Hydrographic Surveying I
29.162	Hydrographic Surveying II
29.173	Project
29.174	Major Project (6 hours per week)
29.213	Geodesy III
29.231	Geophysics for Surveyors
29.232	Atmospheric Effects on Geodetic Measurement
29.313	Astronomy III
29.513	Photogrammetry III
29.514	Remote Sensing Principles
27.173	Remote Sensing Applications
29.654	Land Development IV
29.632	Land Inventory II
29.663	Cadastral Surveying and Land Law III
29.664	Modern Title Concepts
29.802	Cartography II
29.803	Mapping Technology

Not all electives are offered in any one year. Subjects from other Schools and Faculties may be substituted with approval of the Head of School.

**3760  
Surveying Science**

**Bachelor of Surveying Science  
BSurvSc**

The course consists of a mandatory program of 103 class contact hours including a General Studies program of 12 hours and an Elective Program of at least 77 hours. A student may undertake in any one session a load generally not exceeding 24 hours, comprising subjects from one or more of these programs, provided they are taken in sequence within each subject area and in accordance with their prerequisite and/or co-requisite requirements.

**Mandatory Program**

The mandatory program consists of the following subjects:

	<b>Hours per week</b>	
1.971 Physics I	12	}
10.011 Mathematics I	12	
29.001 Surveying I	4½	
29.002 Surveying II	5	
29.191 Survey Camp I	3	
29.700 Professional Orientation	1½	}
1.962 Physics of Measurement**	3	
10.022 Engineering Mathematics**	8	}
10.341A Statistics S.U.		
and B Parts A and B**	4	
27.295 Physical Geography for Surveyors**	4	
29.003 Surveying III	5	
29.121 Electronics for Surveyors**	2	
29.151 Survey Computations I	4	
29.701 Seminar I	1	
29.801 Cartography I	3	
29.152 Survey Computations II	4	
29.211 Geodesy I	4	}
29.511 Photogrammetry I	4	
29.702 Seminar II	1	}
29.703 Seminar III	1	
6.600 Introduction to Computing	5	
	91	

**Elective Program**

This program consists of at least 18 hours (or 6 technical electives) selected from elective subjects of the final year of the BSurv course plus any subjects required as prerequisites for these electives and any combination of subjects offered by this University, the University of Sydney or Macquarie University provided that they are approved by the Head of School for the individual program of study. Such approval would require that a student follows a particular sequence of subjects within a selected area. This prescription means in effect that the elective component of the course can be varied to enable the student to choose the specialization that best suits his individual requirements so long as such specialization falls within the general disciplines associated with Surveying. Electives for such specialization may be chosen, for instance, from subject areas such as:

- Cartography and Mapping Technology
- Geography, Geographic Data Analysis, Mathematical Methods for Spatial Analysis
- Town, Urban and Neighbourhood Planning
- Geodesy, Geology, Earth Physics, Oceanography and Marine Science
- Astronomy
- Photogrammetry, Remote Sensing
- Land Law, Title Concepts, Cadastral Surveying
- Land Inventory
- Land Development and Management
- Building Economics
- Accounting and Computer Applications

Illustrative examples of programs that could be taken are available from the School.

\* Offered in Year 1 of the BSurv Course (3740).

† Offered in Year 2 of the BSurv Course (3740).

‡ Offered in Year 3 of the BSurv Course (3740).

§ Offered in Year 4 of the BSurv Course (3740).

\*\* May be replaced by a similar subject at least equal in coverage of the topic. Any resulting additional contact hours may be used in satisfying the Elective Program.

**General Studies Program**

This program consists normally of 4 General Studies subjects of 3 hours each (or their equivalent) and may be undertaken at any time during Years 2-4 of the Course, subject to the total load for a session (which as a rule should not exceed 24 hours).