ACED
AUSTRALIAN COUNCIL OF ENGINEERING DEANS

AUSTRALIAN ENGINEERING HIGHER EDUCATION STATISTICS 2010–20

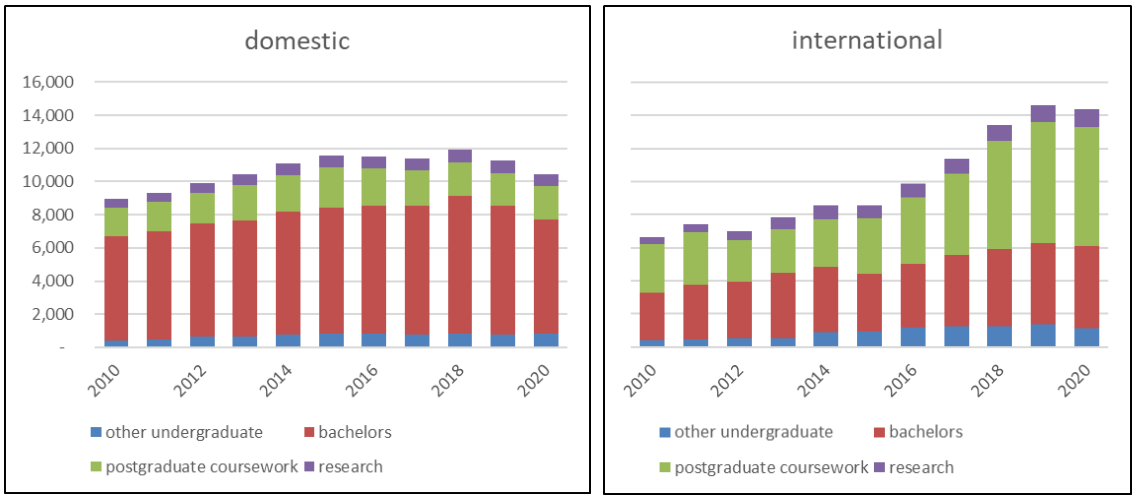
GRADUATE NUMBERS AND QUALITY INDICATORS

STUDENT NUMBERS

DIVERSITY AND INCLUSION

ACADEMIC STAFF

ACED MEMBER PROFILES



Higher Education Graduations in Engineering & Related Technologies, 2010-20

APRIL 2022

SUMMARY NUMBERS AND FACTS FOR AUSTRALIAN HIGHER EDUCATION IN ENGINEERING & RELATED TECHNOLOGIES

SYSTEM SIZE IN 2020

Total enrolment: 117,650 students – 4,330 less than in 2019

Student load: 78,778 EFTS (effective full-time students)

The **35 public universities** (36 ACED members) had **97%** of these enrolments and approximately **4,620 full-time equivalent academic staff** (excluding casual staff)

GRADUATES AND PARTICIPATION OF WOMEN, 2020

qualification levels	domestic		international	
	number	% women	number	% women
Bachelor (mostly 4-year Hons)	6,918	17.2%	5,007	21.7%
Postgraduate coursework	1,986	19.8%	7,194	20.2%
Research (PhD and Masters)	691	24.7%	1,049	26.2%
Other undergraduate awards	823	11.3%	1,111	15.6%
TOTAL	**10,418**	**17.7%**	**14,361**	**20.8%**

colours indicate up/same/down compared with 2019 figure

Proportions of professional engineering degree graduates in engineering branches, 2019

branch of engineering	domestic	international
civil & environmental	33.9%	31.4%
mechanical & manufacturing	18.8%	23.4%
electrical & electronics	18.3%	22.7%
chemical, mining, materials	10.1%	11.9%
mechatronics & robotics	7.2%	4.2%
software	3.8%	2.0%
biomedical	3.4%	1.2%
aerospace	3.2%	2.3%

Approximately six months after graduation, employed graduates of undergraduate awards had:

measure surveyed in 2020-21	engineering	all fields
median salary	$70,000 (ranked 5/21)	$65,000
full-time employment rate	80.3% (ranked 6/21)	68.9%
graduate overall satisfaction	72.3% (ranked 19/21)	77.9%
employer overall satisfaction	90.4% (ranked 1/10)	85.3%

More than 75% of the bachelor degree graduates in Engineering are likely to have commenced higher education study in the same institution, up to 6 years earlier.

COMMENCING STUDENTS AND PARTICIPATION OF WOMEN, 2020

qualification levels	domestic		international	
	number	% women	number	% women
Bachelor (inc. Honours)	13,162	19.3%	5,928	18.1%
Postgraduate coursework	3,007	19.4%	6,271	22.7%
Research (PhD and Masters)	722	25.1%	1,379	32.1%
Other undergraduate awards	2,179	13.2%	1,119	12.9%
TOTAL	**19,070**	**18.9%**	**14,777**	**20.9%**

Engineering enrolled **5.3%** of all **domestic commencing** students starting bachelor degrees, down from 5.8% in 2019. Engineering was the field of education with the **highest proportion (65.7%)** of commencers with **ATAR 80.00 and above**.

The number of **international commencing** students dropped by **26.5%** from the 2019 figure.

AUSTRALIAN ENGINEERING: HIGHER EDUCATION STATISTICS

1. INTRODUCTION

This report and appended data tables are authoritative resources and commentary on the size and performance of Engineering education in the Australian higher education (HE) system, up to academic (calendar) year 2020[1].

The headline change from previous trends was the downturn of 26.5% in on-shore international commencing enrolments, due to the COVID-19 pandemic. This will impact on the future supply of engineers into the workforce via Australia's temporary visa programs, as discussed briefly in Section 11.

The data cover the field of education 'FoE03 Engineering and Related Technologies'[2] This includes programs in 'Engineering' as recognised by the engineering profession, and 'Related Technologies' in aviation, maritime, and spatial sciences, including surveying. These areas are commonly provided within engineering faculties and comprise a small proportion of the FoE 03 aggregates. All of FoE03 is inferred by the term 'Engineering' unless otherwise explained.

The data cover HE programs at Levels 5 (diplomas) to 10 (doctorates) of the current Australian Qualifications Framework (AQF). The mapping of education programs to qualifications that may be eligible for external accreditation by Engineers Australia is explained in Section 2.

The providers of Engineering programs include the 35 public universities that are all members of the Australian Council of Engineering Deans (ACED). A small number of these offer programs overseas at their own campuses, or in partnership with others. Private HE providers and the Vocational & Training (VET) sector contribute less than 2% of the HE awards in Engineering completed in 2020.

Enrolment and graduation data are provided for the past ten years, with details on the participation of women[3] and Indigenous students. **New in this year's report (in Section 3.4) are data on the proportions of graduates in each major branch of engineering for accredited professional engineering degrees**, compiled from additional 2016-19 graduation data provided by ACED members.

Engineering continues to perform well on student, graduate and graduate employer satisfaction, and graduate employment rates and median salaries. These conclusions are drawn from the most recent national surveys run by the government's Quality Indicators for Learning & Teaching (QILT) program. **Some negative impacts of COVID-19 on student and graduate satisfaction rates and short-term graduate employment are evident in the 2020 results.**

For bachelor degrees (including Bachelor Honours degrees), information is provided on commencing Engineering students' admission profiles, and their success, retention, and graduation (completion) rates. Selected data for some other fields of education and 'All field' aggregates are provided for comparison. Data on teaching loads, including research supervision[4], and academic staffing for Engineering are provided, in order to compute the average student-to-academic staff ratio.

A summary each ACED member's program profile, and its commencing student and graduation numbers, is also provided, together with a commentary on the Engineering graduate profile of each of the established formal university groupings. The paper concludes with a brief discussion of the challenges ahead for engineering education in meeting the foreshadowed demand for engineers.

The Appendix contains detailed data. References to sources are included in the footnotes.

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[1] Most of the data in this report are from the public Australian Department of Education, Skills and Employment (DESE) Higher Education Statistics collections, accessible at https://www.dese.gov.au/higher-education-statistics. These data have been supplemented by data purchased by ACED. HE Statistics data are compiled from information supplied by education providers. While complying with the DESE's requirements, providers do not report some data (such as the sub-field of graduations) to the same levels of detail. Inconsistencies that impact on data accuracy and interpretation are noted in the text.

[2] The Australian Standard Classification of Education (ASCED) defines 11 Fields of Education, plus 'Mixed-Field' programs. See Appendix 1, Table 17 for the list of subfields in FoE 03 and FoE 02 Information Technology.

[3] DESE data uses gender categories 'male', female, and 'indeterminate/intersex/ unspecified'. The body of this report adopts the term 'women' in the commentary on participation rates and diversity, on the basis that the DESE data classified as 'female' are aggregated from individuals' reporting on their gender identity.

[4] Other research performance data (such as competitive grants, publications, and engagement) are not included in this report.

CONTENTS

Australian Council of Engineering Deans Inc.

The membership of ACED is a senior academic representative of each of the 35 Australian universities that provide professional engineering degrees accredited by Engineers Australia.

ACED's mission is to promote and advance engineering education, research and scholarship on behalf of the Australian higher education system.

Position papers and other reports are on the ACED website: www.aced.edu.au

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2. AWARD LEVELS AND EXTERNAL ACCREDITATION BY ENGINEERS AUSTRALIA

Higher education programs in Engineering and Related Technologies are delivered at Level 5 (Diploma) through Level 10 (Doctorate) of the Australian Qualifications Framework (AQF)[5].

Australian higher education providers are regulated by the Tertiary Education Standards and Quality Agency (TEQSA) and must align their programs with the level specifications and descriptors of AQF. All of the Australian universities that are members of ACED are 'self-accrediting' institutions: they have the power to offer educational awards in the fields covered by their TEQSA registration.

Providers of engineering programs also align their programs to the expectations and needs of the engineering profession.

Engineers Australia (EA) accredits[6] programs that deliver the educational qualification for entry to supervised practice in three occupations: professional engineer, engineering technologist and engineering associate (senior technicians), as listed in the following table:

EA membership category	Award (minimum full-time equivalent academic years of study, post-secondary school)	AQF Level	International Accord
Professional Engineer	Master (coursework) (5 years) Bachelor Honours (4 years)	9 8	Washington
Engineering Technologist	Bachelor (3 years)	7	Sydney
Engineering Associate	Associate Degree (2 years) Advanced Diploma (2 years)	6	Dublin

EA specifies accreditation standards as a set of 'graduate competencies' for each occupation, known as the 'Stage 1 Competency Standard'. These competencies are in knowledge and skills, engineering application ability, and professional and personal attributes. They are benchmarked against the graduate attributes specified for the educational accords of the International Engineering Alliance (IEA)[7].

The EA accreditation process evaluates programs for their delivery of the graduate competencies in the relevant branch of engineering against criteria covering the academic program design and implementation and the provider's operating environment and quality assurance processes. Accreditation covers programs for up to five years from the year of evaluation.

Graduates of EA accredited programs are deemed to have met the Stage 1 Competency standard for the applicable occupational category, and the educational requirements for EA graduate membership of that occupation. Their qualification is also recognised as equivalent (in terms of educational outcomes) to those of the other signatories of the corresponding IEA educational accord.

Three matters that impact on the interpretation of data in this report require further explanation:

(i) Since 1980, EA has required the accredited professional engineer qualification to be of **at least four full-time study years' duration** (or part-time equivalent) following completion of a Year 12 secondary school certificate or equivalent. From 1980 to 2013, the majority of graduates at many universities were awarded their 4-year degree 'with Honours', based on merit. Since 2014, providers have been required (for compliance with the Australian HE Standards) to configure their four-year

[5] Changes to the Australian Qualifications Framework are currently under consideration by the Commonwealth government. This report uses the 2013 AQF classifications in force in 2020. See https://www.aqf.edu.au/

[6] Engineers Australia's program accreditation process and criteria and the lists of accredited programs can be accessed at https://www.engineersaustralia.org.au/About-Us/Accreditation

[7] The IEA is a self-governed international organisation of bodies that each has their jurisdiction's responsibility for accreditation of engineering qualifications and standards of engineering practice. Currently, the Washington Accord has 20 full signatories. The Sydney and Dublin Accords have 11 and 9 full signatories respectively. See http://www.ieagreements.org/

degrees as 'Bachelor Honours Degrees' as defined in AQF Level 8. **The BEng(Hons) is therefore the 'standard' degree for entry to professional engineering practice in Australia.** Any class of level of Honours is awarded on merit. Most of the data provided in this report aggregates 'bachelor degree' numbers that cover awards at AQF Levels 7 and 8. The Appendix Tables 15 and 16 list ACED members' programs at these two levels.

(ii) Until the mid-2000's, coursework Master degrees (AQF Level 9) in engineering were offered primarily to already-qualified professional engineers to **advance** their engineering and technical knowledge. **These degrees were not accredited by EA.**

Since the 2000's, most of the Australian university providers and some private providers have developed two-year **'entry-to-practice Master degree**' programs that are aimed at domestic[8] and international bachelors graduates with suitable engineering science degrees and other prior qualifications. These programs are eligible for accreditation by EA to the Professional Engineer standard.

The aggregated data for Master (coursework) graduates presented here includes numbers for both advanced and entry-to-practice types of Master degree programs. The Appendix Tables 15 and 16 provide data on the numbers of programs and branches of engineering provided by each ACED member.

(iii) Research degrees (doctorates and Master degrees at AQF Levels 10 and 9, respectively) are not considered by EA for external accreditation. Some summary data presented here for Master degree enrolments and graduations includes these Master degrees.

These overlaps in award designations and data classifications thus make it impossible to use the national data collections to provide exact answers to questions like:

'*How many domestic students were awarded an accredited Professional Engineer qualification in a given year?'*

'*How many of these graduates were in Civil Engineering?*

'*How many domestic engineering professionals are taking an advanced Master degree?*', and

However, for the first time, answers to at least the first two of these specific questions are answered, in Section 3.4, from aggregations of supplementary graduation information provided by ACED members during 2021.

Appendix Table 15 lists the ACED providers of accredited HE programs at AQF levels 7 and 6, the latter mostly being Associate Degrees. AQF level 7 Bachelor degrees may be eligible for EA accreditation for the Engineer Technologist occupation. Some Advanced Diplomas may be eligible for accreditation for the Engineering Associate occupation. The student enrolment and graduation data for these levels includes data for programs that are not aimed primarily at occupational outcomes, but are intended primarily as pathways to enrolment in BEng(Hons) degrees.

Vocational education and training (VET) providers, including TAFE institutions, offer awards in Engineering primarily at AQF Levels 3 to 6. The lower of these levels are qualifications for engineering trades, the higher ones are for engineering technicians. Most programs offered by the VET sector follow a competency-based education and training model, rather than the curriculum model used in higher education. Competency-based Advanced Diplomas in Engineering may be eligible for consideration by the EA accreditation process at the level of Engineering Associate. Information on these awards is not provided in this report.

[8] Notably, the University of Melbourne and The University of Western Australia ceased offering 4-year Bachelor degrees to commencing students in the 2000s, and adopted a '3yr BSc +2yr MEng' engineering qualification model. Their 2-year MEng degrees are also available on the open market to suitably qualified domestic and international candidates. Charles Sturt University educates its professional engineers via a BTech + MEng program.

3. AWARD COMPLETIONS (GRADUATIONS) IN ENGINEERING AND RELATED TECHNOLOGIES

3.1 Graduations by award level

The total numbers of graduates by detailed award level over 2010-20 are provided in Appendix Table 1. Figure 1 summarises these numbers for four broad award levels: research (doctorate by research and research Master degree), postgraduate coursework, Bachelor, and other undergraduate awards (Associate Degrees, Advanced Diplomas and Diplomas).

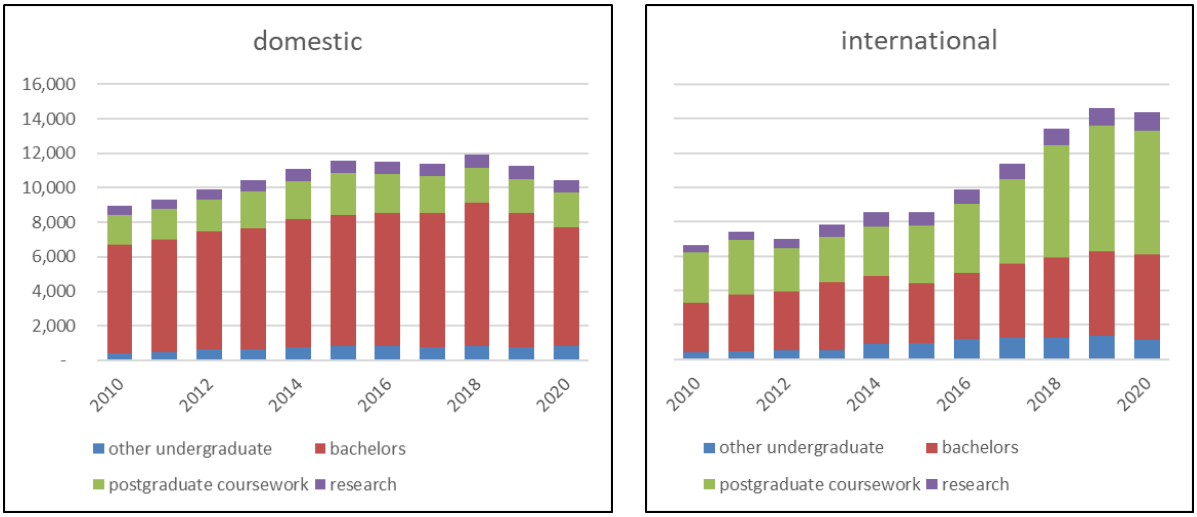

Figure 1 Domestic and international student graduations, 2010-20

The total number of graduations by international students overtook domestic graduations in 2018. The international figures include those from programs offered by Australian providers at offshore campuses or in partnerships with local institutions. The offshore programs that are offered by ACED member universities and are accredited by Engineers Australia are listed in Appendix Table 16(b).

3.2 Graduations 2020: key points and trends

(i) *PhDs and Research Master degrees (domestic: 704; international: 1,059)*

- Graduations from research degrees have more than doubled over the decade, predominantly from the tripling of international PhD graduates. The latter have constituted the majority of research graduates since 2013. The peak of domestic research degree graduations was 767 in 2019.
- The proportion of women graduating from research degrees appear to have fluctuated around 25% in recent years, for both domestic and international cohorts.
- In 2020 Engineering had about 10% of the total domestic research degree graduations across all fields of education, and nearly 27% (24% in 2019) of the international research degree graduations (not including doctorates by coursework),.

(ii) *Postgraduate coursework (domestic: 1,712; international: 7,207)*

- International student graduations from Master degrees dropped slightly from the previous year's number to 7,118, largely from accredited entry-to-practice Master degrees. Over five years, this sub-cohort has more than doubled. The participation rate of women appears to have settled to approximately 21%.
- Domestic Master degree graduations dropped again, to 1,149 in 2020 from 1,601 in 2018. The majority of these graduates are likely to have taken the entry-to-practice Master degrees at The University of Melbourne and The University of Western Australia. The participation rate of women has increased over recent years, to its largest figure of 22.9% in 2020. There appears to be a long-term decline in the numbers of practising professional engineers taking a full-advanced Master degree.

- The number of Graduate Certificates and Graduate Diplomas awarded to domestic students increased by 10% for the second successive year, to 563. These awards are most likely to have been made to practising professionals.

(iii) *Bachelor degrees (domestic: 7,428; international: 5,030)*

- The 2020 international total was the largest on record**.** The domestic total is about 10% less than the 2018 peak (8,295), and is the lowest figure since 2014.
- These totals include 566 domestic and 602 international graduates of 3-year degree programs (see Appendix Table 2). Many of these are from non-engineering degrees, such as civil aviation that had 156 and 233 domestic and international graduates respectively. Some of the engineering graduates at this level are likely to use their 3-year qualification as credit in articulating to a professional engineering degree.
- Approximately one-third of the domestic bachelor degree graduates, and 7% of international students, respectively, graduated from programs of at least 4-years duration (Appendix Table 2). These are 'dual', 'double' or 'combined' degree programs from which graduates gain an additional bachelor degree award for study in another discipline (typically science or business), a co-op program in which students gain an additional award for industry-based study, or a BEng(Hons), MEng combination.
- The participation rate of Australian women graduating with a bachelor degree exceeded 17% for the first time. Following previous commencing enrolments trends, the proportion of international women graduates was about 5% higher.

(iv) *Other undergraduate (domestic: 833; international: 1,303)*

- Associate Degrees and Advanced Diplomas were awarded to about 650 students for the ninth successive year. Consistently, 75-80% of this total are domestic graduates. Many of the engineering graduates at this level use this qualification to articulate into professional engineering degrees.
- In contrast, 75% of the graduates of Diplomas and enabling programs were international. Many of these graduates will articulate to enrolments in bachelor degrees as discussed in Section 5.4. There may be more students on enabling (foundation) pathways, but who are not assigned by their provider to the Engineering field of education.

(v) Professional Engineer qualifications

- From these data, and other information, it is estimated that approximately 7,500 domestic students and 11,500 international students graduated from an accredited BEng(Hons) or an entry-to-practice Master degree in 2020. These numbers are elaborated in Section 3.4.

3.3 Undergraduate completions by areas of engineering

Appendix Table 2 provides details of undergraduate (AQF levels 8, 7 and 6) award completions for 2020, by duration and 4-digit ASCED code sub-classification of Engineering & Related Technologies (see Appendix Table 17). As the HE system is demand-driven, these data also provide insights into the relative attractiveness of the main areas of the field taken by domestic and international students. Figure 2 presents indicative trends[9].

Key points:

(i) for domestic students, the proportion of civil engineering graduates increased further in 2020, while electrical/electronic engineering stabilised, and the proportions graduating in the mechanical engineering group, and in 'process and resources'[10] decreased;

[9] These data are not definitive because several universities report their graduations against two generic ASCED codes (0300 and 0399). The proportions and trends reported here assume that the universities that do report against the 4-digit codes are, collectively, representative of all. See Appendix Table 2. Table 15 and 16 list the branches of engineering offered by ACED members.

[10] This combination includes Chemical Engineering and Mining Engineering.

(ii) for international students, civil, mechanical and electrical/electronics engineering graduations each continue to graduate about 25% of the cohort;

(iii) More than half of the domestic graduates, and 75% of international graduates in the aerospace category were from 3-year degrees, predominantly in civil aviation[11]), taken alongside qualification for a commercial pilot licence. One provider offers its civil aviation degree program offshore.

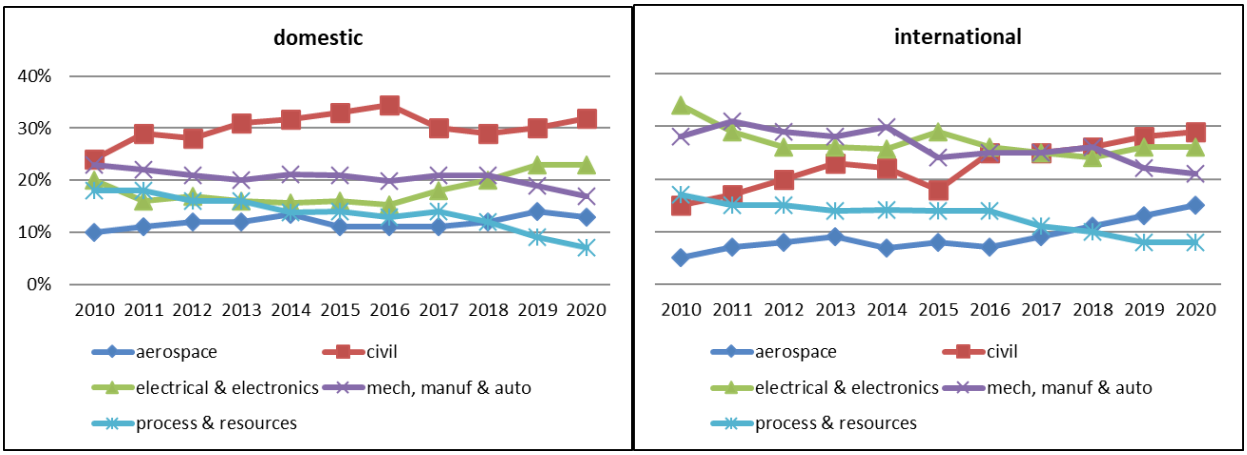

Figure 2 Indicative distributions of bachelor degree (3-year and 4-year) awards by broad areas of engineering, 2010-2020

The participation rates of women graduating in each of these broad areas differ quite substantially, indicative of their interest and demand. For the 2020 domestic graduates from undergraduate programs, the proportions of women were approximately:

selected sub-fields of Engineering & Related Technologies	participation rate of women, %
aerospace (inc. civil aviation)	23%
civil	17%
electrical & electronics	10%
mechanical, manufacturing & auto	9%
process & resources	24%
all fields	**16.9%**

Note also that:

- the participation rate of women graduating from Aerospace Engineering degrees is likely to be in the range 10-15%, similar to those of mechanical and electrical engineering groups.
- the number of graduates (of any gender) in Mining Engineering is about one quarter of the process & resources group, pointing clearly to Chemical Engineering having the highest proportion for women (estimated to be approximately 30%).
- Civil Engineering has the second highest participation rate of women graduates, at about 18%.

Given the high prospective demand for engineering graduates (see Section 11), these participation rates point to the challenges for increasing the proportions of women in engineering study and the profession, especially in the large and traditional discipline areas.

3.4 Graduations from degrees accredited at the Professional Engineer level

The national data and analysis provided above do not directly provide accurate answers to the key question: "**How many graduates gain BEng(Hons) and Masters degree that are accredited at the**

[11] Separate HE Stats data for 2020 reported 38 women (24%) amongst the 156 domestic graduates from the undergraduate qualifications in aviation, from seven university providers. There were 60 women amongst the 233 international graduates from these programs, including from one off-shore program.

Professional Engineer (PE) level?" These qualifications are the formal educational pathways to both professional engineer employment and to postgraduate research, and are the main coursework business of ACED members, and other higher education providers in engineering.

To answer this question more accurately, ACED members supplied their domestic and international graduation numbers for 2016-19 by program and title. The aggregations published in the report on the ACED website[12] show growth of international graduate of the entry-to-practice Master programs over that period, but fairly stable distributions across 13 grouped branches of engineering. The charts in Figure 3 show the proportions of 2019 domestic and on-shore graduates in each group.

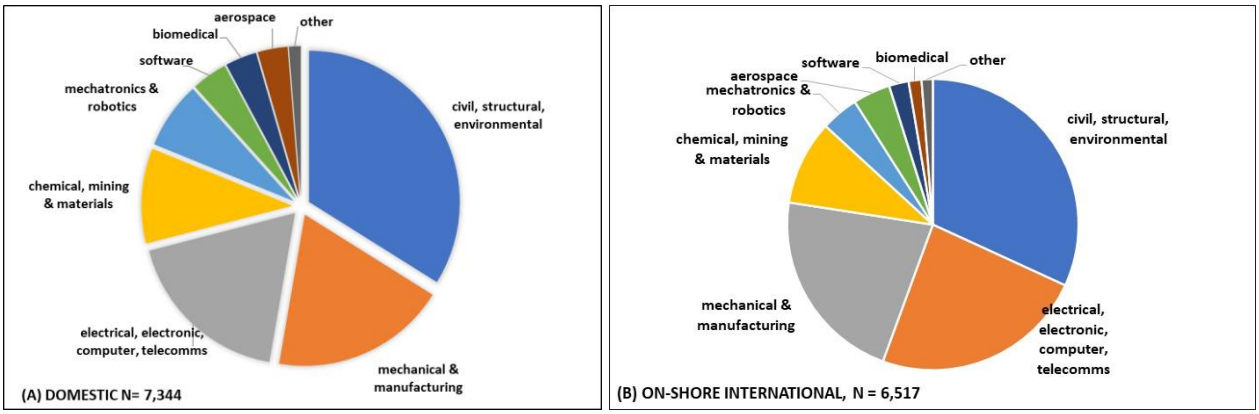

Figure 3 Distributions of (A) domestic and (B) on-shore international graduates of accredited Professional Engineering degrees amongst engineering branch groups, 2019.

The civil/environmental engineering group is the largest in both domestic and on-shore international cohorts. The mechanical engineering group is larger than in the electrical-electronic engineering group for domestic graduates, but that order is reversed for international on-shore graduates.

Comparisons with USA are also interesting. In 2017-18 the USA reported 136,233 Bachelor of Science (Engineering) graduates[13], of whom about 10% were designated as 'foreign', and 21.3% were women. On these figures, it appears that Australia has graduated annually fewer than 3 new Australian professional engineers per 10,000 population, while USA graduated nearly 4 Americans.

Whereas one-third of Australia's PE graduates are in civil/environmental engineering, the comparable USA figure is 10.7%. The contrasting difference is that one-third of USA graduates are in electrical and computer engineering, and in 'engineering-designated' computer science[14] (which presumably includes software engineering). The table below shows that other areas have similar proportions.

engineering discipline area	% of degrees awarded		engineering discipline area	% of degrees awarded	
	Australia	USA		Australia	USA
Mechanical, Mechatronic, Industrial/Manufacturing	26.0%	28.3%	Biomedical	3.3%	5.2%
Electrical, Computer, Softw'e*	22.1%	32.3%	Aerospace	3.2%	3.0%
Civil, Environmental	33.9%	10.7%	Other**	1.3%	8.5%
Chem, Mining, Petrol', Mat'ls	10.2%	11.7%			

*The US data in this category includes 'Computer Science (within Eng.)'

** The US data in this category includes incudes Biological/Agricultural, Engineering Science/Physics, Nuclear, Eng. Management, and Engineering (General/Other)

[12] The full report, *ACED Graduates by their Branch of Engineering 2016 – 2019*, is at https://www.aced.edu.au/downloads/ACED%20Graduates%20by%20Branch%20of%20Engineering%20May%202021%20-%20RKing.pdf

[13] See Roy, J (2019). *Engineering by the Numbers*. American Society for Engineering Education (ASEE). https://aseecmsprod.azureedge.net/aseecmsprod/asee/media/content/publications/pdf/2018-engineering-by-numbers-engineering-statistics-updated-15-july-2019.pdf.

[14] In the Australian DESE data sets, Computer Science students and graduates are counted in FoE 02 Information Technology.

4. TOTAL ENROLMENTS AND STUDENT LOAD

4.1 Total enrolments

The data by detailed award level provided in Appendix Table 3, are summarised in Figure 3 for the broad award level categories. Total enrolments are the cumulative result of student commencements (Section 5) and successful progression and retention in their programs (Section 6). The latter factors are almost constant from year to year.

The large reduction in international commencing student enrolments from 2020 caused by the pandemic has clearly impacted on the total international enrolments. The small reductions in total domestic enrolments follow the downturn in commencing enrolments in Bachelor degrees during 2014-17.

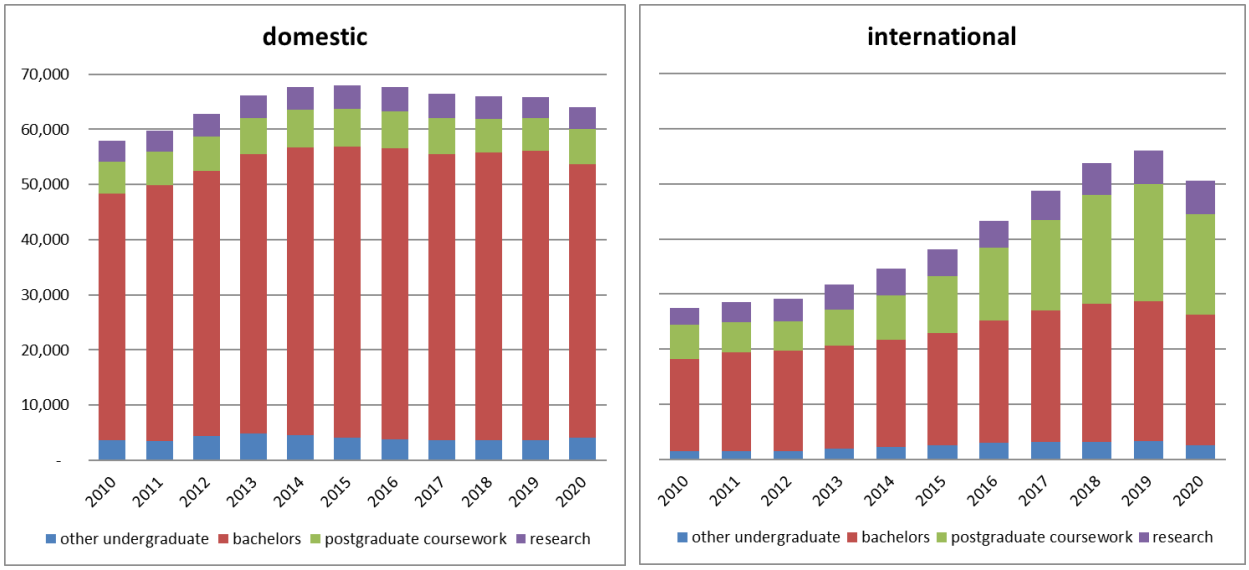

Figure 3 Domestic and international student enrolments, 2010-20

4.2 Student load

A full-time student (taking 8 courses per academic year or undertaking research training) accounts for one unit of "effective full-time student load (EFTSL)". The following table summarises the taught load in Engineering & Related Technologies field for domestic and total enrolments. The taught load for the international students is the difference between the total and domestic load, for each corresponding cell.

Year	doct-orate	master	other p/g	bachelor	other u/g	enabling	non-award	total
domestic 2016	2,695	3,249	546	34,783	1,455	7	51	42,787
domestic 2017	2,721	3,164	469	33,730	1,437	5	61	41,587
domestic 2018	2,514	2,888	457	33,545	1,390	<5	45	40,839
domestic 2019	2,257	2,700	515	33,969	1,420	17	59	40,936
domestic 2020	**2,322**	**2,694**	**608**	**35,028**	**1,686**	**15**	**52**	**42,401**
% change from 2019	2.9%	-0.2%	18.1%	3.1%	18.7%	-11.8%	-11.9%	3.6%
total 2016	6,440	13,264	662	50,828	2,600	7	723	74,525
total 2017	6,661	15,714	594	51,272	2,659	5	378	77,284
total 2018	6,786	17,813	563	52,055	2,512	<5	358	80,089
total 2019	6,721	18,351	664	52,597	2,639	17	420	81,406
total 2020	**6,866**	**16,296**	**753**	**51,980**	**2,656**	**15**	**213**	**78,778**
% change from 2019	2.2%	-11.2%	13.4%	-1.2%	0.6%	-11.8%	-49.3%	-3.2%

The load attributed to **non-university providers** in 2020 was 1,565 EFTs, less than 2% of the total load, as in previous years. In Engineering, this component of load is mostly for undergraduate or enabling programs.

From 2019 to 2020, the total load dropped by 3.2%, while domestic load increased by 3.6%, following the enrolment trends. Bachelor degree student load is the largest component. Research training remains dominated by international load. The pandemic has evidently stemmed the steady growth of international enrolments (and load) in entry-to-practice Master degrees.

Earlier year load totals, and the 2020 detailed data for 4-digit ASCED sub-codes (corresponding to the major branches of engineering) are provided in Appendix Table 4.

Assuming all the 2020 load is attributed to teaching and supervising Engineering students[15], the 78,887 EFTs load is generated by the 118,229 enrolled students. As in previous years, each Engineering student represents approximately two-thirds of one EFT of teaching load. The difference between this number and parity is due to two factors: part-time student enrolment and the contribution of teaching load from other academic areas into engineering programs. Most of the latter load is 'service teaching' of mathematics, science and computing into the first two years of undergraduate engineering programs.

In Section 9.3, the load data are combined with staff data to estimate the overall student-staff ratio for engineering teaching and research training undertaken by the ACED members' faculties and schools.

[15] This is a reasonable assumption, since few engineering course units are taken by students enrolled in other fields of education.

5. COMMENCING ENROLMENTS

5.1 Commencements by award level

Each graduation is preceded by a commencing enrolment. Figure 4 shows these numbers for the broad award categories over the past decade. More details are in Appendix Table 5. While most students commence their enrolment into the first study-year of the program, some will commence with advanced standing into a later study year.

The rapid growth of international student commencements underpinned the overall growth of engineering enrolments up to 2018. The large decline of commencing international enrolments in 2020 is attributed to the COVID-19 Australian border closures.

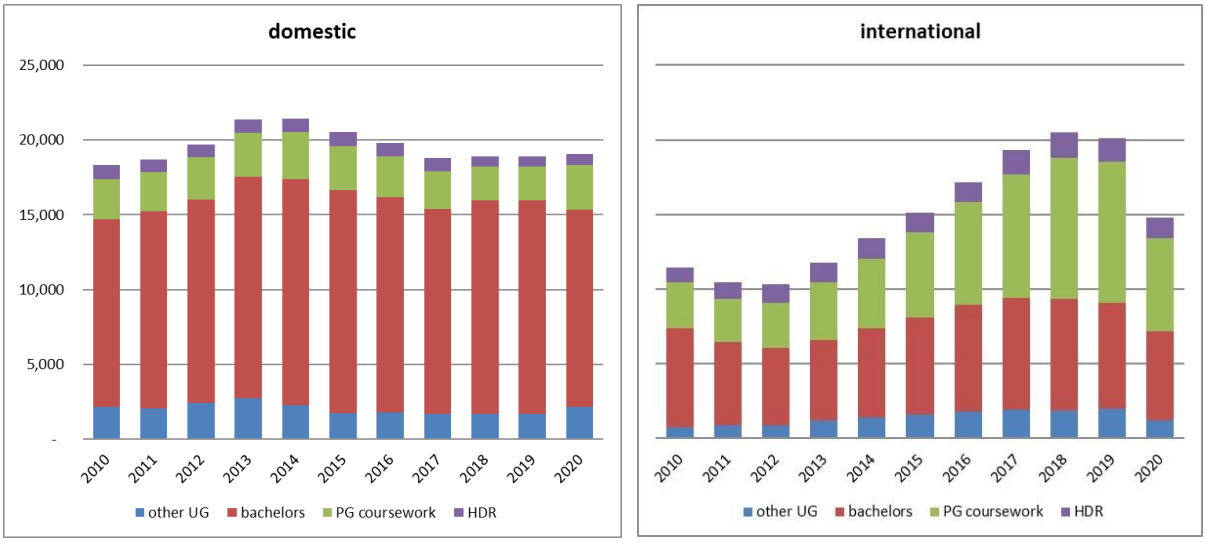

Figure 4 Domestic and international student commencing enrolments, 2010-2020

Further comments on 2020 data and trends:

(i) *PhDs and research Master degrees (domestic: 737; international: 1,371)*

- Domestic PhD and research Master commencements **increased significantly** on the 2019 figures, although both remained below their peaks, reached in the middle of the last decade.
- International PhD commencements **decreased significantly for the second successive year, to** 1,129, a similar figure to that in 2013. By contrast, research Master commencements **increased to 242,** the highest figure on record.

(ii) *Postgraduate coursework (domestic: 3,043; international: 6,256)*

- The 33% drop in international commencements into coursework Master degrees was surely due to the border restrictions imposed as a result of the COVID-19 pandemic. Almost all of these enrolments were into entry-to-practice Master degrees that are eligible for accreditation by Engineers Australia.
- Domestic commencements into coursework Master degrees rose to 2,003, the largest number since 2017. These include approximately 550 enrolments into the entry-to-practice professional engineering degrees at the University of Melbourne and The University of Western Australia. The 1,040 domestic commencing enrolments into Graduate Diplomas and Graduate Certificates, 400 more than in 2019, appear to continue last years' trend of increased enrolments into postgraduate awards aimed at practicing engineers, and graduates of other areas included in the FoE3 category.

(iii) *Bachelor degrees (domestic: 13,938; international:5,997)*

- Domestic commencing enrolments into bachelor degrees fell by about 3% on the 2019 figure, and were also a smaller proportion of students commencing bachelor degrees, across all fields of education (see Section 5.3).

- There was a 14% one-year **decrease in international** commencing enrolments, partly due to COVID-19, but also continuing the downward trend since 2017. This underlying trend is probably a result of increased local provision of bachelor degrees in countries from which Australia previously drew enrolments and that are now Washington Accord signatories, and the increasing preferences of international students with local non-accredited degrees to take the 2-year entry-to-practice coursework Master degree pathway to a professional engineering qualification.

(iv) *Other undergraduate (domestic: 2,182; international: 1,206)*

- Commencing domestic enrolments in Associate Degrees and Advanced Diplomas increased significantly to 1,239, the highest figure since 2015. By contrast the 206 international commencements in this category was 33% less than the 2019 figure.
- Domestic commencing enrolments into 'Enabling and Other' programs in 2020 increased by 37% on the previous year. By contrast, the number of international enrolments in this category (1,000) was down by more than 40% on last year's figure. These programs are intended to provide pathways into higher level awards.

5.2 Participation of women commencing engineering awards

Overall, 2020 saw the proportions of women in the domestic and international commencing cohorts increase to 18.9% and 20.9% respectively, their highest on record. It is more informative to observe the recent participation trends separately for the broad award categories, as in Fig 5.

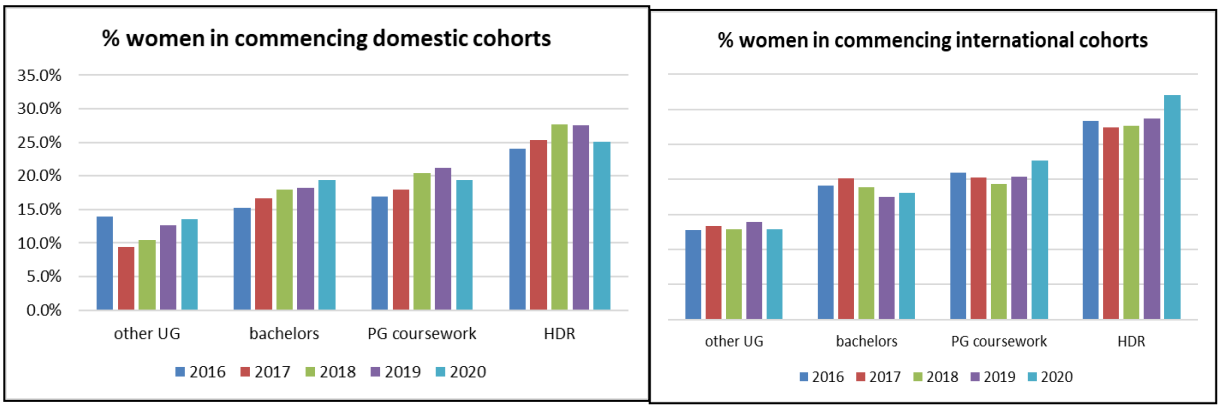

Figure 5 Participation of women in the commencing domestic and international student cohorts of broad award categories, 2016 - 20

Several trends are evident:

- the participation of women in domestic bachelor degrees has trended steadily up, by nearly 1% per year. This is also the largest category, having approximately 2,500 women per year.
- the participation rates of women in the domestic and international cohorts have substantially converged, while the rate for the international bachelor degree cohort has trended down since 2017. Specific reasons for this are not known.
- the participation rates of women in postgraduate coursework and research awards are higher than those in undergraduate awards. Having a large cohort of women with research degrees may provide good role models for undergraduate engineering students.

The participation rates of women commencing undergraduate study across the **branches of engineering** cannot be deduced reliably from any commencing enrolment data, partly because many institutions do not require bachelor degree students to confirm their choice until second year. The relative attractiveness of each major branch to women may however be deduced from **graduation** data, provided in Section 3.3. As reported there, women are likely to participate progressively less strongly in the areas of chemical engineering (30%), civil engineering (18%), and electrical and mechanical engineering (10%).

These national participation rates conceal considerable variations between provider institutions, reflecting their program mix (in terms of branches of engineering offered), location, history, and size.

Table 14 of the Appendix records the proportions of women in the commencing domestic and international cohorts for ACED members. For institutions with at least 200 commencing students in either citizenship category, the participation rates of women range from 12.02% to 31.4% (domestic) and 12.4% to 34.8% (international).

The higher rates are found in universities that offer programs in areas of chemical and environmental engineering, and that admit high proportions of school leavers. From Dean's reports, Environmental Engineering (which links to both chemical and civil engineering) and Biomedical Engineering are likely to attract approximately 30% and 50% women.

5.3 Domestic commencements in Engineering compared with other fields of education

Figure 6 (from data in Appendix Table 8) records the numbers of domestic students commencing HE awards in several fields of education, for all award levels. The grand total (449,723) in 2020 was 11% greater than in 2019. **Engineering had only 4.2% of these enrolments, the lowest on record.** Science had 7.5% (also less than the previous 4 years) while Information Technology had 4.1%, continuing its upward trend since 2013. Having less than 16% of all commencing students in these core STEM fields raises questions about Australia's future capability (see Section 11).

The share of **domestic bachelor degree** commencements in Engineering amongst all fields of education de**creased to 5.4% in 2020,** from 5.7% in 2019, and is the lowest value on record (see Appendix Table 7). The shares in Science[16], Health and Management & Commerce also decreased, while Information Technology increased.

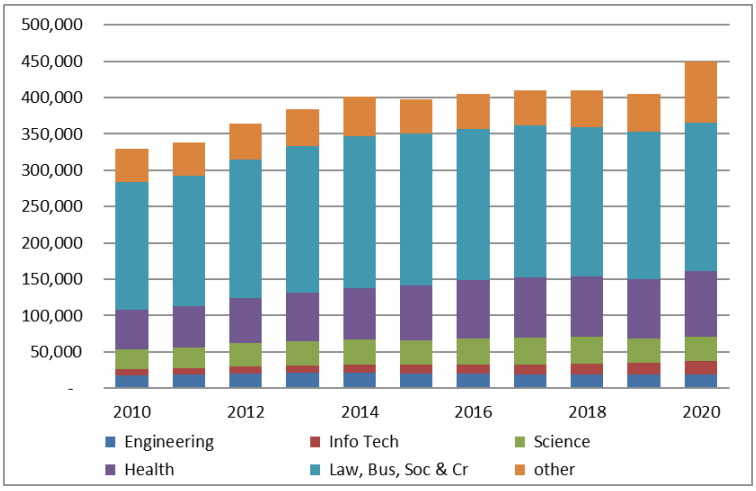

Figure 6 Domestic commencing enrolments (all award levels) in selected fields of education, 2010-20

5.4 Domestic students: entry paths into bachelor degrees and ATAR bands

Detailed data on commencing Engineering students' 'basis of admission' are provided in Appendix Table 8(a). The last four years' data are provided here, with the 2020 distributions shown for 'All students' and for women:

basis of admission	domestic commencing Engineering students				
	2017	2018	2019	2020 (All)	2020 (Women)
completed secondary school	61.6%	63.4%	63.1%	61.7%	67.1%
VET/TAFE	6.1%	6.1%	6.3% %	5.5%	3.2%
higher education	21.7%	21.0%	21.0%	22.1%	22.4%%
other	10.2%	9.4%	10.0%	10.7%	7.3%

[16] These include commencements at the two universities that no longer enrol school leavers directly into undergraduate engineering, but who will ultimately graduate with an accredited Master degree.

These patterns of admission have been reasonably stable over the last seven years. Nearly two-thirds (61.7% in 2020) of commencing students were admitted to engineering bachelor degrees on the basis of their secondary school completion. The proportion admitted on the basis of a VET qualification (probably gained from the TAFE sector) dropped to 5.5% in 2020. The proportion entering on the basis of a HE qualification (such as an Associate Degree or Enabling Diploma) or as a transfer from another institution role slightly to 22%.

The final column in the Table above shows that relatively more women enter on the basis of completing secondary school, and relatively fewer have a VET qualification. Given the low participation of women in VET engineering qualifications, it is possible that a quite high proportion of those who complete VET choose to progress to HE.

The published data on undergraduate admissions and offers shows the distribution of **offers by ATAR band** for the applicant student cohorts for all fields of education. The 2020 shares are presented for Engineering and selected other fields in Appendix Table 8(b), and in Figure 7.

As in previous years, Engineering had the strongest ATAR profile of all fields[17] (including those not shown), on the basis that it is the field with the highest proportion (65.7%) of offers to candidates with ATAR greater than 80.05. (The corresponding figure for Science is 64.8%). Engineering also has the lowest proportion (7.6%) of entrants with ATAR less than 60.05), and is the field with the **highest proportion of offers** (58.4%) made on the basis of ATAR. It is surely an urban myth that taking Engineering is 'wasting a good ATAR'.

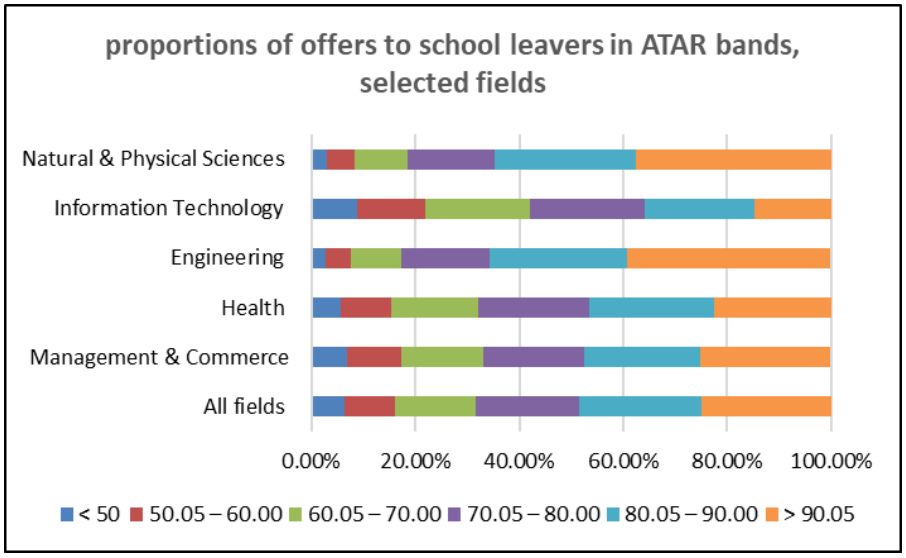

Figure 7 Proportions of offers in decadal ATAR bands made to school leavers in selected fields, 2020

5.5 Countries of origin of commencing onshore international students

The top sixteen countries that provided commencing on-shore international students in both 2019 and 2020 are detailed in Appendix Table 9. The 2020 numbers show a one-year 40% drop of on-shore commencing enrolments, surely due to the impact of COVID-19 entry restrictions. Every country is the list contributed fewer students.

In both years, China (excluding SARs and Taiwan) and India held the top two places, together accounting for 54% of the total in 2020, down from 61% in 2019. Pakistan, Sri Lanka and Viet Nam filled next three country spots in both years. 'All other countries' would have been placed 3rd on both years' lists.

Other observations on the 2020 data, and changes from 2019 are:

[17] The sub-fields of Medical Studies, Dental Studies and Veterinary Studies within Health have stronger ATAR profiles, but much smaller enrolments than Engineering.

- India and China suffered 55% and 40% reductions in enrolments, respectively;
- China replaced India in top place for the number and proportion of postgraduate commencers;
- Malaysia replaced Nepal in 6th place overall;
- Saudi Arabia dropped from 7th to 10th place;
- Nepal has moved up the 6th place, largely by virtue of the large number of postgraduates.

The corresponding data for 2021 are likely to show a further drop in commencing on-shore enrolments, as a result of the continuing COVID-19 pandemic.

6. COMMENCEMENTS AND COMPLETIONS BY INDIGENOUS STUDENTS

Indigenous students enrol and graduate from Engineering & Related Technologies in small numbers. The following table shows the national figures for commencements and completions in broad award categories over 2016-20:

Stage Year	Post graduates	Bachelor (inc Hons)	Other	Total		
	Persons	Persons	Persons	Male	Female	Persons
Commencements						
2016	12	102	20	115	19	**134**
2017	21	143	18	146	36	**182**
2018	17	120	22	128	31	**159**
2019	16	137	38	156	35	**191**
2020	**33**	**151**	**49**	**188**	**45**	**233**
Completions						
2016	7	38	10	51	<5	**55**
2017	8	34	8	45	5	**50**
2018	6	52	<5	53	8	**61**
2019	8	37	13	46	12	**58**
2020	**14**	**47**	**7**	**57**	**11**	**68**

The commencing Indigenous student numbers in Engineering have increased over the past five years, but with a participation rate that reached only 1.2% in 2020. The 2020 participation rates for IT, Science and Health, were 1.1% and 1.6%, respectively.

Overall, the 2020 Indigenous participation rate for commencing students is 2.3%. There were higher than average participation rates in Health (2.4%), Education (2.6%) and Society & Culture (2.8%). Evidently, all areas of STEM have much catching-up to do. The inclusion challenge is also evident in terms of gender, given the male bias of most STEM disciplines, although 69% of the commencing Indigenous students in 2020 were women, 8% more than in the total commencing domestic cohort.

Completion numbers for Indigenous students in Engineering indicate relatively high attrition, with completion rates of around 40%. The 2020 graduates from bachelor degrees would have commenced study during 2014-17.

Appendix Table 10 elaborates the Indigenous commencements and completion data by State and Territory. Queensland has consistently enrolled and graduated the largest numbers of Indigenous students, followed by New South Wales.

7. BACHELOR DEGREES: SUCCESS, RETENTION, COMPLETION RATES

The appendices of previous editions of this report have included detail on the success and retention rates for bachelor degree students. Data at this level of detail have not been collected for the past two years, following the inclusion of visual analytics for Attrition, Retention and Success Rates on the HE Statistics website, and some changes to the definitions used.

7.1 Annual success rates

The success rate is defined as the proportion of courses (units of study) passed by a cohort of enrolled students in a given year. The following table adds detailed 2020 success rates for domestic and international students enrolled in bachelor degrees in Engineering, to data for the three previous years, and 2001 as a baseline. The success rates are averaged over all years of study.

Success rates	Domestic				International			
	men		women		men		women	
	full-time	part-time	full-time	part-time	full-time	part-time	full-time	part-time
2001	85.5	72.0	89.5	77.8	85.7	76.6	89.1	80.6
2017	87.4	73.7	90.2	77.3	86.9	76.2	91.7	77.0
2018	85.5				84.2			
2019	85.9				86.0			
2020	86.3				87.4			
	89.8	79.7	92.7	82.1	91.4	85.8	94.3	90.4

It is evident from the detailed rows of this table that:

- the average success rate in each category have tended to increase over time;
- women perform better than men in the corresponding category by a few per cent;
- students in part-time study have lower average success rates than their full-time peers.

Previous reports included data that demonstrated that success rates increase once beyond their commencing year of study. The post-2017 aggregated rates smooth out these category differences.

The visual analytics tool enables on-line inspection of the success rates of each provider. Differences in average success rates reflect provider location (regional/metropolitan) and history, and the educational background, cohort size and the typical patterns of study (full-time/part-time) of their Engineering cohorts:

- amongst ACED members, the average 2020 success rates for domestic bachelor degree students in Engineering ranged from >90% (eight providers) to <70% (one provider).
- for international students this range was from >90% (eight providers) to <70% (four providers).

The data also allows comparisons with other fields of education:

- the average success rate of 86.3% for domestic students in Engineering in 2020 was slightly higher than the 'All Fields' average of 84.6%. This placed Engineering fifth in the 11 fields of education after Health, Agriculture & Environment, Creative Arts and Architecture & Building. The average success rates ranged from 71.3% (Food, Hospitality and Personal Services) to 90.0% (Health).
- for international students, the average success rate in 2020 was 87.4% for Engineering, tenth amongst the 11 fields of education as in 2018, but two places lower than in 2019. Average success rates ranged from 82.2% (Information Technology) to 92.6% (Health).

7.2 Annual retention rates

Retention rates[18] record the progression outcome for the identified year as 'retained' for either **continuing** to the subsequent year of study or for **graduating in the year of study or the following year.** (The retention rates reported in 2020 therefore record the student outcomes from 2019. Attrition is the corresponding loss of students from their degree program.)

The visual analytics tool now reports only on retention for **commencing students**, (i.e. those in their first year of enrolment in a course of study) in two ways. Put simply, the 'normal' rate applies to retention within an institution (using StudentID), while 'adjusted' rates allow for following year transfer to another HE provider, using the StudentID and CHESSN (national) identifiers. The following year enrolment may be in a different program or field of education.

Transfer from Engineering to other fields of education has previously been estimated to be up to 9%, primarily after the first year of study. Transfer into engineering from another field is less common.

The following shows the last two years of retention rate data for bachelor degree students in Engineering & Related Technologies, compared with All Fields, and comparable 2008 baseline data:

Year		Domestic		International	
field of education		Normal Rate, %	Adjusted Rate, %	Normal Rate, %	Adjusted Rate, %
2008	Engineering	87.42	91.85	90.91	90.91
	All fields	82.09	87.2	90.76	90.76
2018	Engineering	86.37	91.4	91.77	91.78
	All fields	79.15	85.13	90.09	90.10
2019	**Engineering**	**87.02**	**92.2**	**89.7**	**89.7**
	All fields	**79.9**	**86.6**	**87.3**	**87.3**

The adjusted rates show that more than 92% of domestic commencing bachelor degree students in Engineering return to study in the following year or graduate (although these would be very few in number). This figure compares favourably with the adjusted retention rate of about 86% across all fields of education.

The differences between the adjusted and normal rates imply that about 4 – 6% of domestic students in Engineering transfer between institutions after their commencing year of study. International students have slightly higher retention rates and apparently zero transfer rates, as is to be expected from their student visa conditions. Average retention rates have been quite stable over several years.

As for the success rates, there are significant average differences in retention rates for different study-modes and between provider institutions. For Engineering, the most recent adjusted retention rates ranged from >95% at nine universities (all but one in a capital city), down to <80% at three regional institutions.

Previously collected data and ACED research found that the retention rates for students continuing from their second year of study towards graduation were higher than that from the commencing year of study, typically higher than 95%. **For 100 commencers into the first year of a four year program, these average rates imply (simplistically) that at least (0.92)x(0.95)x(0.95)x(0.95) = 79 graduates would complete their program**. This is broadly consistent with the average completion rates discussed below.

7.3 Completion rates

While the annual success and retention data record students' progression through their program, completion rates quantify students' pathways through their period of enrollment in higher education.

[18] The definitions for the attrition and retention rates may be found at https://heimshelp.education.gov.au/resources/glossary/glossaryterm?title=Attrition%20Rate and https://heimshelp.education.gov.au/resources/glossary/glossaryterm?title=Retention%20Rate

A visual analytics tool for 4, 6 and 9-year outcomes is available by commencement year, field of education (of the student commencement) and institution. The following table shows aggregated data for the domestic cohorts at the ACED member universities who commenced bachelor degrees in Engineering, from 2009. The final row of each set is the outcome of 2020 graduation data.

The four entries (A,B,C,D) in each row for each outcome set, show a high level of stability in the average progression and completion patterns. They show that:

- after 4 years of study, about 25% of the students will have completed a degree;
- after 9 years of study, approximately 75% will have completed, but 5% are still enrolled;
- about 5% of the total cohort will drop out of higher education after their first year. In fact, this drop-out rate is low (less than 3%) for about one-fifth of the ACED members, but greater than 10% for one-third of them;
- about 20% of the commencing cohort will never complete, with a small number leaving after six or more years of enrolment.

Year first enrolled	4-year outcomes, %				6-year outcomes, %				9-year outcomes, %			
	A	B	C	D	A	B	C	D	A	B	C	D
2009	25.8	59.2	9.5	5.4	62.3	19.1	13.8	4.8	75.1	5.0	15.5	4.4
2010	25.0	59.6	9.8	5.6	63.1	18.4	13.5	4.8	75.1	5.4	14.9	4.6
2011	26.5	58.5	10.0	5.0	63.3	18.7	13.6	4.4	76.1	5.0	14.9	4.1
2012	25.5	58.5	10.5	5.6	61.2	19.2	14.5	5.1	74.3	5.2	15.8	4.6
2013	24.7	58.5	10.0	5.0	62.0	18.0	14.4	5.6				
2014	24.5	58.6	10.7	6.5	61.6	18.8	14.0	5.6				
2015	25.5	58.0	10.3	6.2	60.8	19.8	14.0	5.5				
2016	25.0	59.3	9.2	6.5								
2017	23.2	61.3	9.5	6.0								

Key A: award completed; B: still enrolled; C: re-enrolled but dropped out; D: never came back after first year

These rates are not estimates of the 'likelihood of completion' of the original degree in which a student was enrolled, because their reported graduation may be in another field of education. The completion data allow for transfers between higher education institutions.

The HE Statistics Unit does not routinely produce data that tracks cohorts of graduates back to their original enrolment. The 2018 ACED Statistics Report used additional commissioned data to show that changing institutions is likely to increase the overall duration of study by about one year. Those data also showed that only about 25% of the 2015 graduates in the national BEng(Hons) degree cohort would have completed in 'minimum time'. This result is consistent with the data in the table above. There is, however, quite a wide variation in this proportion between provider institutions, due to students' study mode (part-time/full-time), enrolment in dual degrees, temporary withdrawal of enrolment, etc.

Key take-home messages from these completion data are that:

- more than 75% of students who **commence** a bachelor degree in Engineering & Related Technologies are likely to graduate within nine years;
- more than 75% of the graduates who **graduate** with a bachelor degree in Engineering & Related Technologies from the institution at which they commenced in higher education are likely to complete within six years.

These are important messages for external stakeholders, some of whom may believe that the standard bachelor degree that leads to a professional engineering qualification is of three year's duration (see Section 2), and that 'most' graduations are – or should be – achieved in 'minimum time'. For a school leaver undertaking a dual degree, or a program that contained extended industry internships, the minimum enrolled time is already at least five years. Part-time enrolment also, obviously, increases the duration of study.

8. STUDENT SATISFACTION AND GRADUATE OUTCOMES

All of the student-related data discussed so far have been aggregated from data submitted to DESE by provider institutions. To understand how students, graduates and employers rate the quality and value of higher education, DESE runs sample surveys under its Quality Indicators for Learning and Teaching (QILT) program[19].

8.1 Student Satisfaction

The most recent QILT Student Experience Survey (SES) report was published in March 2021, based on survey collections in Jul-Aug and Sep-Oct of 2020. Comparisons with 2019 data therefore provide the students' view of the impact of COVID-19 on their educational experiences.

Appendix Table 11(a) provides undergraduate student satisfaction ratings for Engineering and the other STEM fields, for 2019 and 2020. Figure 8 compares the Engineering and 'All fields' averages for the six components of satisfaction for these two years. For 'All Fields', satisfaction ratings have been quite stable since the introduction of the survey in 2012. None of the component ratings for Engineering changed by more than two points over 2016-19.

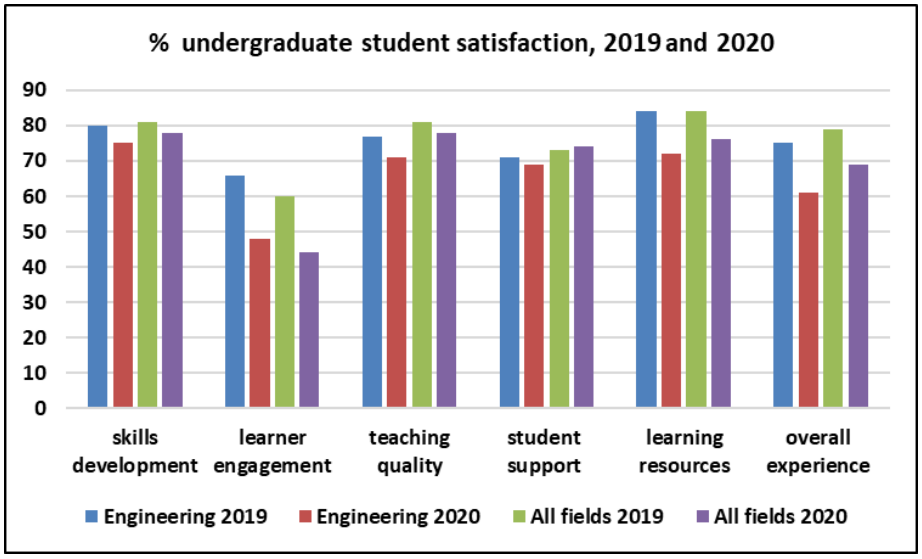

Figure 8. Percentage of undergraduates expressing 'satisfaction' with each criterion, Engineering and 'All fields' averages, 2019 and 2020

For both years, Engineering students' responses are slightly lower than the 'All fields' ratings in all categories except 'learner engagement'. The higher rate of satisfaction in learner engagement expressed by Engineering students may be attributed to project and studio work throughout their program, but the relatively low absolute satisfaction rates, even in 2019, warrants further attention.

The 2020 undergraduate student satisfaction rates are lower than those for 2019 in almost all cases shown. The impacts of COVID-19 are most evident in the >10% drop in 'learner engagement' and 'overall experience', for both Engineering and 'All fields'.

The QILT report discusses these findings for 'All Fields', noting that students' responses to individual survey questions clearly picked up on having fewer opportunities "*to work with other students as part of your study*", reporting a 14% drop in satisfaction, while "*participating in discussions on-line or face-to-face*" had a 1% increase in satisfaction.

Engineering students expressed larger decreases (from 2019 to 2020) in satisfaction across all survey components, than the 'All fields' averages. Under 'learning resources', the Engineering drop of 12% likely to correlate with their responses to survey questions on "*quality of laboratory or studio*

[19] The QILT reports and data for all the reports referred to here can be accessed from Home (qilt.edu.au) f

equipment", and "*quality of teaching spaces*". Interestingly, for 'All fields', the item "*quality of assigned books, notes and resources*" received only a 2% decrease in satisfaction.

It is gratifying to read, however, that the 2020 survey found Engineering students expressing only small decreases in satisfaction in the 'skills development' and 'student support' components of the survey. These results are testament to the enormous efforts made by academic and support staff to adapt their teaching to the changed circumstances, and ensure the highest possible quality of learning outcomes.

The satisfaction survey of 2020 Engineering postgraduate coursework students provided similar ratings and annual decreases as has been described above (see Appendix Table 11(b)). Their ratings of 'learning experience' and 'learning resources' dropped by 14% and 18% respectively. Satisfaction with the 'overall experience' dropped 12%, to 62%. Most of these respondents students would have been international students.

8.2 Graduate Satisfaction

Graduates are surveyed for the QILT Graduate Outcomes Survey (GOS) during the first six months of each calendar year, following qualification for graduation. Appendix Table 11(c) provides the satisfaction ratings for Engineering and selected other fields from graduate surveys conducted in late 2020 and 2021 (thereby applying to 2020 graduates), and the comparable figures from the previous year. Note that the 2020/2021 survey did not include core questions on satisfaction 'teaching quality' and 'generic skills'.

Figure 9 charts the 'overall satisfaction' ratings of graduates from undergraduate programs (Engineering and selected other fields) and postgraduate programs (Engineering and 'All fields').

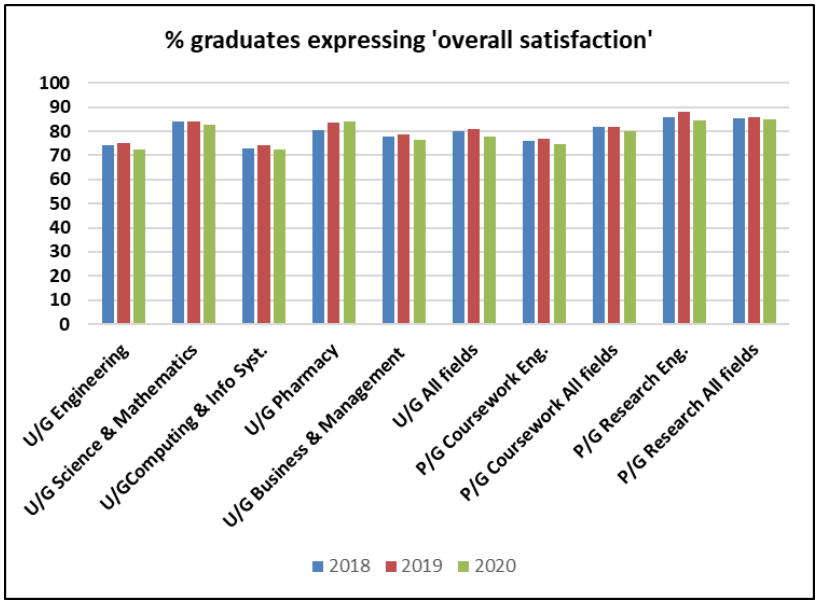

Figure 9 Graduate satisfaction ratings for degrees in Engineering and selected other fields, and 'All field' averages, graduated from 2018-2020

The principal message from these results is that the 2020 graduates expressed only slightly lower satisfaction with their (COVID-affected) educational experience than their 2018 and 2019 predecessors. This appears to be at odds with the large drops in satisfaction rates reported in the SES results above. QILT explained the difference in terms of survey timing, whereby the SES *"reflect[s] the contemporaneous nature of the SES whereas the GOS requires graduates to reflect on their experience some period after they have finished their studies*". (This echoes the famous quote from Mark Twain, "*Distance lends enchantment to the view*".)

Graduates of higher degrees by research (HDR) rate their experience in against seven category areas, as shown in Appendix Table 11(c). COVID appears to have had very little impact on their satisfaction rates. In the survey of 2020 graduates, Engineering research graduates rated four of the categories higher than their 'All fields' average, while the three negative differences were small.

In absolute terms, most category satisfaction rates are high, and only 15% of graduates (Engineering and 'All field') are not satisfied with the HDR experience. The Engineering HDRs rate 'infrastructure' highly, and the 'supervision' rating increased to 81.5% in 2020. The two areas of the Australian HDR experience (Engineering and 'All field') that clearly need attention and received satisfaction ratings below 70%, are the 'intellectual climate', and 'industry and external engagement'.

8.3 Employer Satisfaction Survey

The most recent QILT Employer Satisfaction Survey (ESS) was published on data collected during Nov 2020-Feb 2021 and May-July 2021, thereby spanning the early stages of the COVID pandemic disruption. Data from the report are included in Appendix Tables 11(d) and (e).

Engineering was the field of education with the highest overall employer (supervisor) satisfaction (89.9%). Employers rate engineering graduates clearly above the 'All field' averages in 'foundation', 'collaborative', 'technical' and 'employability' skills, as well as in 'overall satisfaction'. Engineering graduates are marginally above the 'All field' rate for 'adaptive skills'.

Graduates' supervisors rate the **importance** of the graduates' qualification somewhat higher than the graduates themselves (this difference applies to all fields). However, the 66% of supervisors of Engineering graduates rating this measure as 'important or very important', is a lower figure than that for Health graduates (77%), whose education is invariably more specifically focused to well-defined (and regulated) employer needs. About 10% fewer graduates (across all fields) that their supervisors express similar ratings of the importance of their qualification.

The majority (92.1%) of graduates' supervisors across all fields of education rated as 'well' or 'very well' the extent to which the graduates' qualification prepared them for their current role. Engineering graduates were rated marginally lower than this (91.8%) and much lower than those in Health (94.9%). About 10% fewer Engineering graduates themselves expressed the equivalent confidence in the 'fit' of their qualification.

8.4 Graduate Employment Outcomes – short-term

The GOS survey also reports on employment and remuneration outcomes for the Engineering & Related Technologies field of education, compared with selected and 'All' fields are provided in Appendix Tables 12(a)(b)(c). 'Short-term' refers to graduates surveyed in the six months of the calendar year following graduation.

Graduates of Undergraduate Programs

The following table shows (as in previous years) that recent Engineering graduates from undergraduate programs have gained full-time employment and received higher median salaries at higher rates than other fields, as represented by the 'All field' values:

Year of graduation/field	% in full-time employment	median salary		% in any employment	% in further FT study
		men	women		
2018 undergraduate Engineering	**84.8%**	**$ 67,800**	**$ 67,000**	**88.4%**	**12.8**
2018 undergraduates All fields	72.2%	$ 64,700	$ 61,500	87.7%	18.9
2019 undergraduate Engineering	**83.0%**	**$ 69,400**	**$ 70,000**	**87.6%**	**11.2**
2019 undergraduates All fields	68.7%	$ 65,000	$ 63,400	85.1%	18.5
2020 undergraduate Engineering	**80.0%**	**$ 70,000**	**$ 70,000**	**87.0%**	**14.0**
2020 undergraduates All fields	68.9%	$ 66,800	$ 64,200	84.8%	21.1

The 2020 graduate data also shows a second year of decline in full-time employment for Engineering, although the 'All field' rate increased slightly from the 2019 figure, in line with recovery from the initial

impact of COVID. The proportions of graduates in full-time study also increased, for both Engineering and for 'All fields'.

As in previous years, the median salaries received by Engineering graduates have been higher than the surveyed population as a whole, and third after Dentistry and Medicine (see Appendix Table 12(b). The reported median salary for Engineering women was identical to that of men.

The matches between employment and skills are also surveyed. The following table shows that fewer employed graduate Engineers report that their skills are not being fully used, in general, than the 'All field' populations, irrespective of the status of their employment. This difference can be taken to indicate that Engineering degrees provide their graduates with a broad range of skills, even if they are not fully utilised. Relatively more non-engineers are in (some) employment that does not use their skills.

An apparent lack of availability of jobs that do not use expertise is reported by about 20% of all graduates who are in work.

Year of graduation ……undergraduate cohorts	% of FT employed reporting skills not fully used		% of all employed reporting skills not fully used	
	in general	because of lack of jobs in area of expertise	in general	because of lack of jobs in area of expertise
2018 undergraduate Engineering	**19.8**	**22.0**	**26.6**	**19.8**
2018 undergraduates All fields	28.3	20.8	40.4	19.6
2019 undergraduate Engineering	**21.0**	**18.0**	**27.0**	**21.0**
2019 undergraduates All fields	28.1	20.1	40.9	19.5
2020 undergraduate Engineering	**21.9**	**9.3**	**30.2**	**10.0**
2020 undergraduates All fields	29.3	10.2	42.3	11.4

Graduates of Postgraduate Coursework Programs and Research

Relevant data from Appendix Table 12(a) are reproduced in this table:

Year of graduation postgraduate cohorts	% in work, of all avail-able for any work	% in FT work, of all available for FT work	% of FT employed reporting skills not fully used		% of all employed reporting skills not fully used	
			in general	because of lack of jobs in area of expertise	in general	because of lack of jobs in area of expertise
2018 P/G Coursework Engineering	**89**	**85**	**28.7**	**24.7**	**32.2**	**25.1**
2018 All Fields P/G Coursework	92.7	86.8	26.6	19.6	29.0	20.0
2018 HD Research Engineering	**87**	**80**	**20.9**	**39.7**	**24.0**	**35.4**
2018 All Fields HD Research	90.7	81.1	25.8	37.5	29.5	36.4
2019 P/G Coursework Engineering	**89**	**86**	**31**	**18**	**34**	**11**
2019 All Fields P/G Coursework	91.6	85.6	27.2	17.3	29.9	18.3
2019 HD Research Engineering	**86**	**81**	**26**	**32**	**27**	**32**
2019 All Fields HD Research	90.0	80.1	25.6	30.0	28.2	32.2
2020 P/G Coursework Engineering	**89**	**87**	**36**	**16**	**37**	**17**
2020 All Fields P/G Coursework	91.6	84.9	28.7	10.8	31.5	11.6
2020 HD Research Engineering	**81**	**74**	**22**	**20**	**27**	**nd**
2020 All Fields HD Research	88.1	77.7	29.6	25.1	29.9	27.9

The employment outcomes for postgraduates are generally stronger than those of first-degree graduates, but do not display any systematic 'Engineering advantage' over the 'All field' averages. Rather, the high rates of 'skills not being fully used' for both full-time and 'all-employed' Engineering postgraduate coursework graduates in 2020 and relatively low shortage of jobs does not obviously align with the apparent shortages of engineers.

HDR graduates are still reporting high (although declining) rates for underutilised skills.

Appendix Table 11(b) shows that the median salaries earned by postgraduates of Engineering and 'All fields' are significantly higher than those of first-degree graduates. Postgraduate Engineers do not, however, have any advantage over those in other fields. Women Engineers in this category are earning several $',000 less than their male peers, which may be an artefact of the data coverage of both 'entry-to-practice graduates, and established professional engineers taking advanced programs.

Women and men with research degrees (of both Engineering and 'All fields') experience smaller median salary differences than postgraduate coursework graduates, presumably because of the public service conditions of most of the positions in which they are working.

8.5 Graduate Employment Outcomes – medium-term

A medium-term QILT Longitudinal Survey (GOS-L) graduates is also undertaken each year, to report changes in employment, remuneration and occupational roles, over three years from graduation. Details for Engineering and 'All fields' from the survey conducted in 2021 are provided in Appendix Table 12(d), for graduates of undergraduate programs, postgraduate coursework and research degrees. The individuals were first surveyed in 2018 after their graduation in the previous year.

The 3-year changes for Engineering graduates reported in the 2021 survey, and those averaged over the last four longitudinal surveys, are shown in the following table:

measure	undergraduate		postgraduate coursework		postgraduate research	
	surveyed in 2018 and 21	average over four surveys	surveyed in 2018 and 21	average over four surveys	surveyed in 2018 and 21	average over four surveys
F/T employment	10.3%	13.3%	9.7%	9.4%	16.5%	13.6%
Overall Employment	9.0%	8.9%	6.5%	5.8%	10.0%	7.8%
Median Salary	$ 19,000	$ 18,400	$ 21,800	$17,750	$ 7,000	$13,750
Roles (of Overall Employed)						
managers	2.9%	3.3%	6.9%	2.8%	2.1%	-2.0%
professionals	4.1%	5.4%	-2.9%	-1.1%	-0.1%	0.9%
other	-6.5%	-8.7%	-3.0%	-1.4%	1.7%	1.1%

Clearly, these data show good 3-year increases in employment rates and median remuneration outcomes, especially for the graduates of the coursework programs. For them, the median salary increase is well ahead of recent CPI, and they move from 'other' roles into professional and managerial roles. Most of the 3-year employment rates and salary changes for the 2018 graduates have improved more than their four-year averages.

Small proportions of the Engineering graduates of coursework programs would appear to move from professional to management occupations, over the 3-year period. Graduates of undergraduate programs move from 'other' occupations into professional roles, indicating perhaps, their initial difficulties in securing a professional role soon after graduation.

Comparisons of the 3-year changes for Engineering graduates with those from 'All fields' from the most recent survey (Appendix Table 12(d)) show that the Engineering coursework graduates retain their advantage in median remuneration over the three-year period, but that their employment rate advantage diminishes. Higher degree by research graduates of all fields have similar median salaries, although the Engineering graduates appear to have some employment advantage. This outcome may be a reflection of the survey timing after the considerable loss of academic positions during 2020.

9. ACADEMIC STAFF DATA AND STUDENT-STAFF RATIOS FOR ACED MEMBERS

9.1 Academic staff numbers

From HE Statistics sources, in 2020, there were 4,422 academic staff (full time equivalent) in non-casual positions in Engineering in 27 of the ACED member universities (see Appendix Table 13, and Figure 10).

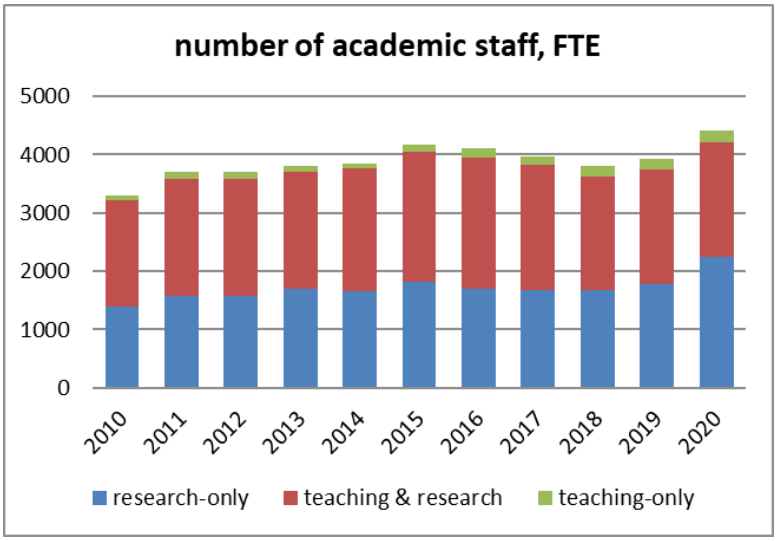

Figure 10 Academic staff (FTE) in Engineering & Related Technologies in 26 ACED universities for 2010-19, and 27 ACED universities in 2020

Most of the apparent increase in staffing for 2020 is due to the inclusion of data from one additional large ACED member institution. Eight universities did not report any academic staff in Engineering[20], in 2020, but it is estimated that collectively, they employed approximately 200 FTE academic staff.

Accordingly, the total number of total number of FTE teaching staff (in Teaching-only and Teaching & Research positions) is accordingly estimated to be 2,620. The number of FTE Research-only staff is estimated to be 2,000. The number of Teaching-only positions in 2020 was at least 180.

According to HE Statistics data, Engineering also employed 673 FTE casual staff in 2020 in Teaching and Teaching & Research roles. Adding estimates for the eight non-reporting providers, a more accurate figure is likely to be around 710. That figure is 28% less than the 990 estimate for 2019, a decrease that correlates with the known staff losses associated with the COVID-19 pandemic.

9.2 Women in Academic positions

The contribution of women (in FTE) in Teaching & Research and Research-only academic positions Engineering has been fairly constant over the last five years. Their contribution to Teaching-only positions in the reporting institutions increased from 17 FTE in 2014 to 60 FTE in 2020. This rate of increase is slightly higher than that of men (67 to 158 FTE) over the same period.

Overall, the proportion of FTE in academic positions increased to 19.6% in 2020, the highest on record.

Figure 11(a) shows that this increase has been primarily in Teaching & Research and Teaching-only positions, but this still lags the proportion in Research-only positions.

Figure 11(b) shows that the proportions of women are highest (>30%) in academic Level B teaching roles, and in 'other' academic roles assigned here to research. Women make up only 14% non-research staffing at levels C and above, lending numeric weight to the many initiatives to rapidly promote Engineering women into higher level academic positions.

[20] Most of these universities operate a multi-field academic structure and would have reported their engineering staff in Science.

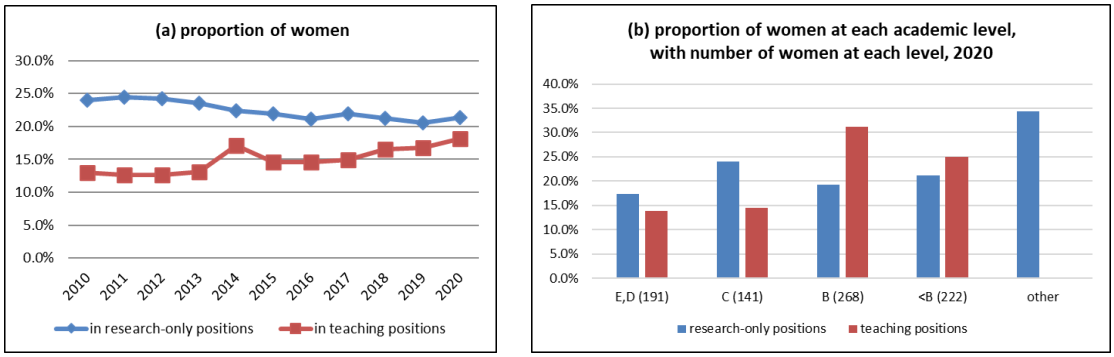

Figure 11 Proportions of women academic staff (FTE) in Engineering & Related Technologies: (a) proportions by role, 2010-20, and (b) proportions and number at each academic level, 2020.

9.3 Student-to-academic staff ratios (SSR)

The aggregate ratio of Engineering student load to teaching-academic-staff (including the estimate of casual staff) for the ACED members, calculated from the 2020 data reported and estimated here is approximately **77,063 EFT/ (2,620 + 710) FTE = 23.1**

This figure is very close to the national average SSR of 24.5 for on-shore teaching, across all universities and fields of study, reported in the HE Statistics for 2020. The average SSRs range from 11.1 to 37.0 for the universities that teach Engineering, but most have SSR between 22 and 26.

10. ACED MEMBER PROFILES AND GRADUATIONS BY UNIVERSITY GROUPINGS

Appendix 1 Table 14 provides summary data for 2020 on the commencing and total enrolments and graduation and student load of all the ACED member universities, listed alphabetically in each state and territory. The University of New South Wales (including its Canberra campus which is a member of ACED in its own right) has the largest number of enrolments and graduations.

Appendix Table 15 provides a tabulation of the coursework awards offered by each ACED member in March 2022. For each member, the table shows the number of engineering branches covered by EA accredited awards (including entry-to-practice Master degrees) and the numbers of other postgraduate Master degrees in two categories: in advanced technical awards, and in management. The latter are mostly 'engineering project management'. Aggregated, there are 18, 14 and 357 fully accredited programs at the Engineer Associate, Engineering Technologist and Professional Engineer levels, respectively, and 16, 13 and 117 provisionally accredited at each corresponding level. This table also lists the alternative options for study of the accredited professional engineering degrees. is

Table 16 (a) elaborates the branches of engineering in which the professional engineering degrees accredited programs are offered onshore, and Table 16(b) the corresponding data for the accredited program offered offshore by six universities.

Australian universities operate in a four formal groupings, according to their focus, history and location. The ACED members of the formal groups[21] are listed below Table 14, together with the 'other' ACED members that are not members of the groups. The membership of some of the formal groups has changed since their foundation.

Figure 12 shows the distributions of Engineering graduates for 2020, by graduate citizenship, program level and gender across the formal groups, and 'others'. The numbers of graduates in each sub-category are shown.

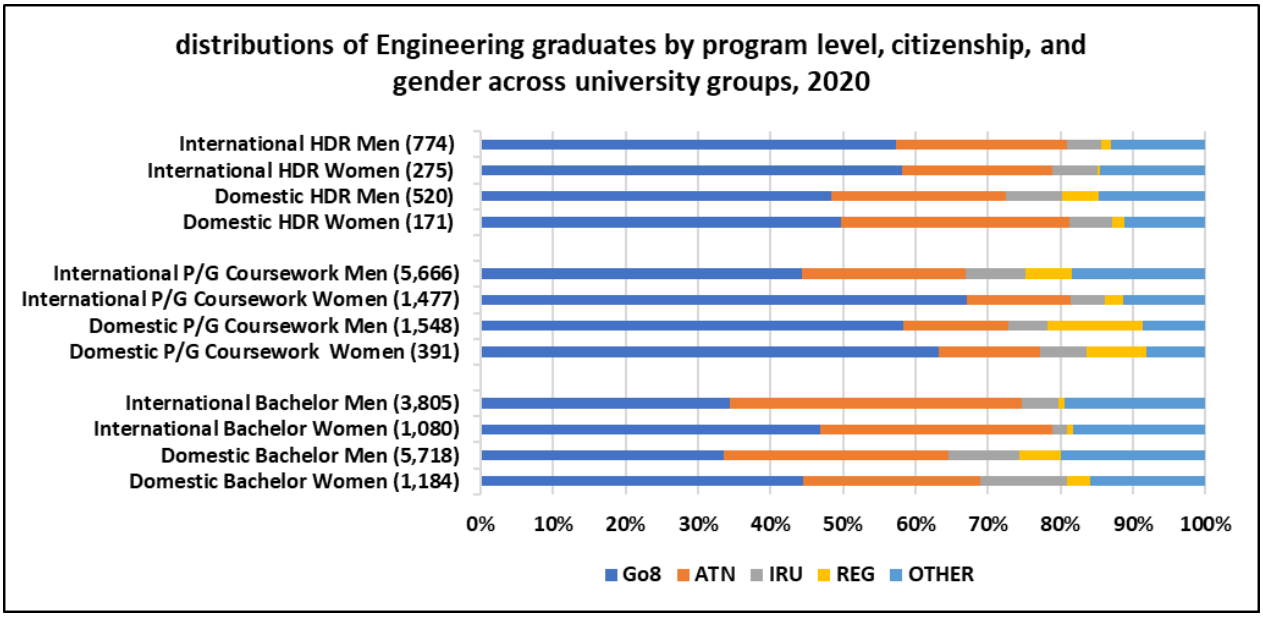

Figure 12 The distributions of 2020 domestic and international graduates in Engineering, by program level and gender across university groups

It is clearly evident from this chart that:

- the Group of Eight (Go8) universities award nearly half of all higher degrees by research (HDR) to domestic students, and more than half of the research degrees that are awarded to international students;

[21] In addition, the 11-member Group of Eight Deans of Engineering and Associates, includes the Go8 members plus The Universities of Newcastle, Wollongong and Auckland.

- the Go8 universities also graduate the highest proportions of postgraduate coursework awards; the high proportion of domestic graduates in this category is from The University of Melbourne and The University of Western Australia.
- the Go8 universities graduate higher proportions of women than men, in all categories. The ATN group has a higher proportion of women (than it does of the men) of domestic HDRs;
- the Australian Technology Network group awards the highest proportion of international Bachelor graduates, and similar proportions of Bachelor degrees as the Go8 group;
- together, the Go8 and ATN group (14 universities, all of which are in Australia's capital cities or largest regional cities) graduate about two-thirds of the domestic Bachelors graduates, and about three-quarters of the postgraduate coursework and research degrees;
- the 'other' category (of 7 universities) has several large providers in major cities, and contributes a further 10-20% of graduates in most categories, most notable in international postgraduate coursework;
- the smaller contributions of the Innovative Research Universities (8 in number) and the 6 Regional Universities Network to the graduate supply of Engineers are significant in terms of their provision of programs of special interest to their communities. For many regional universities, Engineering is one of their highest prestige professional programs.

11. CONCLUSIONS: LOOKING FORWARD

The prime purpose of this annual document is to inform ACED members and stakeholders of the state of engineering education in Australian universities, in terms of graduations, enrolments and admissions, graduate outcomes and staffing, from national data compiled by the Commonwealth Department of Education, Skills and Employment. This edition has provided more detailed data on the numbers of graduates from accredited programs designed to prepare students to enter the professional engineering workforce. The commentary highlights prior trends and provides some comparisons with other fields of education, for context. The data in the report and commentary are intended to be resources for the higher education and professional engineering communities.

Australian engineering graduates have good employment outcomes, and are rated "top of the class" by their employers (Section 8). Furthermore, the ACED community has recently concluded a major project on the required directions of future engineering education[22] to satisfy employers' needs, and those of increased numbers of prospective students, and is now working on the project's recommendations.

The demand and supply of future engineering graduates and engineers are the subjects of current national debate within the faculties and the profession. The COVID-19 pandemic has reduced international student demand. Furthermore, from before and after COVID struck, the government had launched initiatives in advanced manufacturing, defence, space, low-emissions technologies, health and mining technologies. These will increase the demand for engineers in the Australian workforce.

To contribute to the national discussion on increasing the engineer supply, ACED produced two working papers in late 2021[23]. The first addressed the supply pipelines from education and immigration into the Australian engineer workforce. Key findings of the analysis were, firstly, that the temporary visa scheme has formed a significant pool of expertise from which most permanent migrants are drawn. Secondly, the temporary visa scheme was supplied by graduates of the international onshore programs, including the accredited Master degrees in engineering that have fuelled enrolment growth over the past decade. The second paper examined projections of engineer demand, estimating that the need for 100,000 additional engineers by 2030. This paper also highlighted the low level of domestic engineering graduations, compared with other countries. Other groups, including the Go8[24], Engineers Australia[25], and the Engineering for Australia Taskforce[26] have also published on the urgency of addressing these matters. Both immigration and local domestic supply of graduates must be increased, and as rapidly as possible.

With the 2020 commencing enrolment data now published (as in Section 5), it is even more evident that engineering is not yet capturing the attention of school-leavers, and especially women and Indigenous people, as it needs to. ACED and its members will surely contribute to the solution of these and other challenges for growing and maintaining the engineering workforce in the years ahead.

AUTHOR'S NOTE

The author takes responsibility for any errors in transcribing and interpreting data from the sources used in this report. He also thanks ACED members and others for their comments on the draft of this report, and on previous editions. ACED members and other readers are encouraged to contact him to clarify any pertinent matters.

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[22] ACED (2021). *Engineering Change: the future of engineering education in Australia* https://www.aced.edu.au/downloads/2021%20Engineering%20Change%20-%20The%20future%20of%20engineering%20education%20in%20Australia.pdf

[23] The two ACED Working Papers may be accessed from https://www.aced.edu.au/index.php/features/working-papers

[24] Group of Eight (2022). Report: Securing the Future of Australia's Engineering Workforce – Group of Eight (go8.edu.au)

[25] Engineers Australia (2022). https://engineersaustralia.org.au/sites/default/files/2022-03/Engineers-Australia-Skills-Discussion-Paper-20220310.pdf

[26] Engineering for Australia Taskforce (2022). https://www.engineersaustralia.org.au/sites/default/files/resources/increasing-womens-participation-in-engineering-education.pdf

APPENDIX SUPPORTING TABLES

TABLE 1 COMPLETIONS IN ENGINEERING & RELATED TECHNOLOGIES 2010-20

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
DOCTORATES	**792**	**782**	**953**	**1,113**	**1,268**	**1,259**	**1,358**	**1,417**	**1,437**	**1,542**	**1,556**
domestic total	474	399	496	536	572	603	603	637	641	674	628
% domestic female	22.0%	23.3%	23.2%	24.8%	27.3%	23.2%	27.0%	25.0%	28.7%	27.7%	24.8%
international total	318	383	457	577	696	656	755	780	796	868	928
% international female	19.9%	23.0%	25.2%	27.0%	24.3%	26.7%	23.0%	27.4%	22.9%	25.5%	26.8%
% international	40.2%	49.0%	48.0%	51.8%	54.9%	52.1%	55.6%	55.0%	55.4%	56.3%	59.6%
RESEARCH MASTER	**196**	**235**	**212**	**245**	**218**	**229**	**244**	**226**	**222**	**235**	**207**
domestic total	99	115	100	132	103	108	116	105	93	93	76
% domestic female	23.2%	26.1%	15.0%	22.0%	22.3%	31.5%	31.0%	21.9%	32.3%	22.6%	27.6%
international total	97	120	112	113	115	121	128	121	129	142	131
% international female	33.0%	22.5%	**31.3%**	26.5%	24.3%	41.3%	27.3%	23.1%	26.4%	25.4%	21.4%
% international	49.5%	51.1%	52.8%	46.1%	52.8%	52.8%	52.5%	53.5%	58.1%	60.4%	63.3%
COURSEWORK MASTER	**3,684**	**3,829**	**3,404**	**3,758**	**4,138**	**4,748**	**5,431**	**6,348**	**8,074**	**8,662**	**8,267**
domestic total	1,024	1,045	1,145	1,335	1,426	1,543	1,567	1,590	1,601	1,477	1,149
% domestic female	18.6%	16.1%	15.4%	17.9%	18.8%	19.4%	17.70%	17.6%	18.3%	19.2%	22.9%
international total	2,660	2,784	2,259	2,403	2,712	3,205	3,864	4,758	6,473	7,185	7,118
% international female	18.7%	18.9%	19.3%	19.5%	19.1%	19.5%	20.7%	22.4%	22.1%	20.5%	20.5%
% international	72.2%	72.7%	66.4%	64.3%	65.5%	67.5%	71.1%	75.0%	80.2%	82.9%	86.1%
OTHER POSTGRADUATE	**951**	**1,098**	**921**	**945**	**958**	**1,008**	**774**	**681**	**577**	**646**	**652**
domestic total	672	746	704	763	794	848	643	545	466	513	563
% domestic female	22.2%	17.8%	19.5%	17.6%	21.8%	18.4%	17.9%	16.9%	17.2%	19.7%	20.8%
international total	279	352	217	219	164	160	137	136	111	133	89
% international female	15.1%	13.6%	11.1%	16.0%	18.9%	21.3%	18.2%	19.3%	21.6%	15.8%	20.2%
% international	29.3%	32.1%	23.6%	22.3%	20.7%	18.9%	17.7%	25.0%	19.2%	20.6%	13.7%
BACHELOR	**9,149**	**9,849**	**10,261**	**11,018**	**11,373**	**11,117**	**11,561**	**12,043**	**12,987**	**12,597**	**12,458**
domestic total	6,237	6,534	6,795	7,044	7,392	7,634	7,743	7,742	8,295	7,729	7,428
% domestic female	14.7%	14.6%	14.9%	14.6%	15.3%	14.3%	14.60%	14.9%	15.3%	16.0%	17.1%
international total	2,912	3,315	3,466	3,974	3,981	3,483	3,818	4,301	4,692	4,868	5,030
% international female	18.4%	18.2%	18.1%	18.2%	19.9%	19.4%	19.6%	20.3%	22.2%	21.7%	21.9%
% international	31.8%	33.7%	33.8%	36.1%	35.0%	31.3%	33.0%	33.0%	36.1%	38.6%	40.4%
ASSOC DEG & ADV DIPL	**417**	**384**	**663**	**617**	**620**	**699**	**670**	**670**	**699**	**634**	**667**
domestic total	320	327	518	479	523	570	543	493	541	472	475
% domestic female	10.9%	~ 8%	~ 7%	8.1%	9.6%	9.5%	10.1%	7.3%	8.9%	10.0%	9.7%
international total	97	57	145	138	97	129	127	165	158	162	192
% international female	5.2%	~11%	~6%	8.0%	12.4%	12.4%	3.9%	13.9%	16.5%	12.3%	17.7%
% international	8.0%	14.8%	21.9%	22.4%	15.6%	18.5%	19.0%	19.0%	22.6%	25.6%	28.8%
OTHER UNDERGRAD	**404**	**534**	**501**	**551**	**1,035**	**1,029**	**1,350**	**1,350**	**1,364**	**1,555**	**1,469**
domestic total	109	130	141	152	264	239	285	291	278	319	358
% domestic female	4.6%	~ 8%	~ 7%	13.2%	7.6%	7.5%	7.4%	10.3%	8.6%	11.6%	12.8%
international total	295	404	360	399	771	790	1,065	1,099	1086	1,236	1,111
% international female	10.8%	~ 11%	~10%	8.0%	10.0%	14.1%	12.0%	13.9%	15.5%	14.0%	14.7%
% international	73.0%	75.7%	71.9%	72.4%	74.5%	76.8%	78.8%	81.4%	79.6%	79.5%	75.6%
ALL GRADUATES	**15,590**	**16,484**	**16,912**	**18,286**	**19,550**	**20,089**	**21,394**	**22,735**	**25,360**	**25,871**	**25,276**
domestic total	8,935	9,257	9,896	10,461	11,074	11,545	11,500	11,403	11,915	11,277	10,677
% domestic female	15.9%	15.2%	15.2%	15.5%	16.5%	15.5%	15.7%	15.6%	14.9%	17.0%	18.0%
international total	6,655	7,227	7,016	7,825	8,476	8,544	9,894	11,360	13,445	14,594	14,599
% international female	18.3%	18.0%	18.3%	18.6%	19.2%	19.7%	19.3%	20.9%	21.6%	20.5%	20.9%
% international	42.7%%	43.8%	41.5%	42.8%	43.4%	42.5%	46.2%	50.0%	53.0%	56.4%	57.8%

TABLE 2 UNDERGRADUATE COMPLETIONS 2020, BY AWARD, DURATION AND 4-DIGIT FOE CODE

CITIZENSHIP/LEVEL	TOTAL	0300	0301	0303	0305	0307	0309	0311	0313	0315	0317	0399
DOMESTIC												
Assoc. Deg./Adv. Dip	475	52	<5	0	0	12	44	26	38	28	0	274
3-year Bach	566	16	<5	<5	7	20	<5	24	49	266	34	144
4-year Bach	4,424	1,191	93	179	11	423	798	151	618	185	27	748
> 4-year Bach	2,627	1,131	15	135	<5	124	244	20	237	62	11	640
TOTAL DOMESTIC	**8,308**	**2,390**	**113**	**317**	**20**	**579**	**1307**	**221**	**942**	**541**	**72**	**1,806**
% female	16.9	19.4	13.6	24.2	0.0	8.5	17.0	10.0	10.1	22.6	8.3	18.5
~ % of total (ex 300/399)	**4,113**	**-**	**2.7**	**7.7**	**0.5**	**14.1**	**31.8**	**5.4**	**22.9**	**13.2**	**1.8**	**-**
INTERNATIONAL												
Assoc. Deg./Adv. Dip	192	10	0	0	0	9	72	0	33	<5	12	55
3-year Bach	602	57	31	<5	<5	53	0	<5	27	333	26	66
4-year Bach	4,026	1,605	20	188	10	428	767	7	656	50	9	286
> 4-year Bach	420	270	0	12	<5	8	10	0	10	8	<5	96
TOTAL INTERNATIONAL	**5,058**	**1,942**	**51**	**204**	**15**	**489**	**777**	**9**	**693**	**391**	**39**	**448**
% female	21.9	23.2	51.0	43.6	0.0	11.0	22.6	0.0	16.3	26.5	3.9	21.9
~ % of total (ex 300/399)	**2,688**	-	1.9	7.6	0.6	18.3	29.1	0.3	26.0	14.7	1.5	-
% INTERNATIONAL	37.8	**44.8**	**31.1**	**39.1**	**42.9**	**45.8**	**37.3**	**3.9**	**42.4**	**42.0**	**35.1**	**19.9**

ASCED 4-digit codes
0300 Engineering & Related Technologies
0301 Manufacturing Eng. & Tech.
0303 Process & Resources Engineering
0305 Automotive Eng. & Tech.
0307 Mechanical & Industrial Eng & Tech.
0309 Civil Engineering
0311 Geomatic Eng. & Tech
0313 Electrical & Electronic Eng. & Tech,
0315 Aerospace Eng. & Tech.
0317 Maritime Eng. & Tech
0399 Other Engineering & Related Tech's

6-digit ASCED codes are shown in Table 20

Notes:
Low numbers (<5) are suppressed in providers' returns to avoid identification of individuals. Overseas graduations are included.

ANU, Curtin, CQUni, JCU, Murdoch, UNSW, UTS, UWA and WSU use code 0300 for most Bachelor degree graduates. CDU, Griffith, Monash, QUT, USQ and UTas use code 0399 for most Bachelor graduates. Monash uses codes 300 and 399 for most Bachelor degree graduates.

"Software engineering" does not appear specifically in the ASCED codes for either engineering or Information Technology (ASCED FOE code 02), so may be classified in the universities' returns in different ways. See Table 19.

The 0301 Manufacturing sub-code includes "printing", "textile/garment/furniture making", that are likely to be more relevant to qualifications offered by the VET sector.

0315 Aerospace Eng. and Technology includes 3-year civil aviation degrees, taken primarily by students aiming towards the aviation industry. Many of these programs offer commercial pilot training in parallel with the academic award, some of these are overseas programs.

The full set of ASCED codes is at:
http://www.abs.gov.au/Ausstats/abs@.nsf/0/E7779A9FD5C8D846CA256AAF001FCA5C?opendocument

TABLE 3 TOTAL ENROLMENTS (STUDENTS) IN ENGINEERING & RELATED TECHNOLOGIES 2010-20

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
DOCTORATES	**5,567**	**6,258**	**7,059**	**7,427**	**7,668**	**8,035**	**8,338**	**8,718**	**8,971**	**9,117**	**9,120**
domestic total	2,982	3,183	3,404	3,389	3,372	3,617	3,788	3,877	3,664	3,456	3,561
% domestic female	23.8%	23.9%	23.7%	24.9%	25.5%	25.5%	26.1%	26.3%	26.2%	26.8%	27.9%
international total	2,585	3,075	3,655	4,038	4,296	4,418	4,550	4,841	5,307	5,661	5,559
% international female	26.4%	27.1%	26.6%	25.7%	25.9%	25.9%	26.0%	26.8%	27.5%	27.6%	28.5%
% international	46.4%	49.1%	51.8%	54.4%	56.0%	55.0%	54.6%	55.5%	59.2%	62.1%	61.0%
RESEARCH MASTER	**1,245**	**1,191**	**1,194**	**1,148**	**1,191**	**1,182**	**1,070**	**1,017**	**933**	**909**	**961**
domestic total	769	704	689	662	684	712	660	590	493	431	400
% domestic female	20.0%	19.9%	20.6%	22.4%	21.8%	21.5%	21.4%	21.5%	18.2%	19.0%	20.3%
international total	476	487	505	486	507	470	410	427	440	478	561
% international female	28.6%	27.9%	29.9%	29.8%	27.6%	26.6%	28.8%	26.7%	22.5%	25.5%	25.8%
% international	38.2%	40.9%	42.3%	42.3%	42.6%	39.8%	38.3%	42.0%	47.2%	52.6%	58.4%
COURSEWORK MASTER	**9,266**	**8,999**	**9,078**	**10,566**	**12,776**	**15,237**	**18,381**	**21,605**	**24,663**	**25,722**	**23,892**
domestic total	3,630	3,856	4,061	4,434	4,822	5,159	5,358	5,342	5,014	4,743	4,949
% domestic female	17.3%	16.9%	16.9%	17.7%	18.6%	18.8%	17.9%	17.8%	19.2%	19.4%	19.7%
international total	5,636	5,143	5,017	6,132	7,954	10,078	13,023	16,263	19,649	20,979	18,943
% international female	18.1%	18.4%	18.5%	17.6%	17.7%	18.9%	20.2%	20.4%	19.4%	19.4%	20.6%
% international	60.8%	57.2%	55.3%	58.0%	62.3%	66.1%	70.9%	75.3%	79.7%	81.6%	79.3%
OTHER POSTGRADUATE	**2,611**	**2,555**	**2,554**	**2,525**	**2,286**	**1,924**	**1,533**	**1,390**	**1,221**	**1,371**	**1,762**
domestic total	2,151	2,122	2,206	2,177	2,051	1,698	1,328	1,175	1,059	1,155	1,557
% domestic female	19.6%	20.0%	18.8%	19.4%	17.8%	17.4%	17.1%	18.6%	18.2%	18.0%	19.9%
international total	460	433	348	348	235	226	205	215	162	216	205
% international female	16.1%	17.1%	17.2%	19.5%	20.0%	21.2%	21.5%	17.2%	23.4%	20.8%	19.0%
% international	17.6%	16.9%	13.6%	13.8%	10.3%	11.7%	13.4%	15.5%	13.3%	15.8%	11.6%
BACHELOR	**61,518**	**64,236**	**66,207**	**69,342**	**71,560**	**73,138**	**74,874**	**75,767**	**77,365**	**77,851**	**76,755**
domestic total	44,656	46,385	48,083	50,547	52,135	52,755	52,722	51,885	52,254	52,491	52,831
% domestic female	14.0%	13.8%	13.4%	13.7%	14.1%	14.4%	14.9%	15.5%	16.4%	17.3%	18.1%
international total	16,862	17,851	18,124	18,795	19,425	20,383	22,152	23,882	25,111	25,360	23,924
% international female	17.6%	17.5%	17.4%	17.7%	18.1%	19.0%	19.3%	20.0%	19.9%	19.1%	18.9%
% international	27.4%	27.8%	27.4%	27.1%	27.1%	27.9%	29.6%	31.5%	32.5%	32.6%	31.2%
ASSOC DEG & AQF DIPL	**3,050**	**3,408**	**4,318**	**4,199**	**3,746**	**3,654**	**3,400**	**3,233**	**3,218**	**3,192**	**3,284**
domestic total	2,740	2,980	3,818	3,752	3,401	3,240	2,937	2,719	2,715	2,612	2,768
% domestic female	10.3%	n/a	9.0%	9.5%	9.1%	9.5%	9.4%	9.5%	10.0%	10.6%	12.0%
international total	310	428	500	447	345	414	463	514	503	580	516
% international female	3.2%	n/a	24.6%	11.9%	9.0%	6.8%	8.0%	10.3%	12.1%	14.5%	15.5%
% international	10.2%	12.6%	11.6%	10.6%	9.2%	11.3%	13.6%	15.9%	15.6%	18.2%	15.7%
OTHER UNDERGRAD	**2,082**	**1,540**	**1,649**	**2,609**	**3,077**	**3,040**	**3,463**	**3,500**	**3,529**	**3,818**	**1,876**
domestic total	971	576	596	1,175	1,206	847	918	869	876	1,027	1,360
% domestic female	28.1%	n/a	40.4%	24.0%	18.3%	14.5%	17.0%	8.9%	10.0%	12.4%	12.7%
international total	1,111	1,101	1,053	1,434	1,871	2,193	2,545	2,631	2,653	2,791	516
% international female	11.9%	n/a	n/a	8.5%	9.2%	10.2%	11.3%	13.0%	13.4%	12.1%	15.5%
% international	53.4%	71.5%	63.9%	55.0%	60.8%	72.1%	73.5%	75.2%	75.2%	73.1%	27.5%
ALL ENROLMENTS	**85,339**	**88,777**	**92,059**	**97,816**	**102,304**	**106,210**	**111,059**	**115,420**	**119,433**	**121,980**	**117,650**
domestic total	57,899	60,251	62,857	66,136	67,671	68,028	67,711	66,647	66,075	65,915	67,426
% domestic female	15.0%	14.8%	14.5%	14.8%	15.0%	14.9%	15.6%	16.0%	16.9%	17.6%	18.4%
international total	27,440	28,526	29,202	31,680	34,633	38,182	43,348	48,773	53,358	56,065	50,224
% international female	18.3%	18.7%	18.4%	18.4%	18.6%	16.9%	19.8%	14.9%	20.2%	19.7%	20.6%
% international	32.2%	32.1%	31.7%	32.4%	33.9%	35.9%	39.0%	42.3%	44.7%	46.0%	42.7%

TABLE 4 DOMESTIC AND ALL STUDENT LOAD (EFT) IN ENGINEERING AND RELATED TECHNOLOGIES 2020, BY SUB-FIELD AND PROGRAM LEVEL, AND SUMMARY EFT LOAD TOTALS FROM 2011

(a) DOMESTIC STUDENT LOAD

Sub-field of education	Doctor-ates	Master	other p-grad	Bach-elor	other u-grad	Enab	Non award	TOTAL
Manufacturing Engineering & Technology	17	57	2	848	95	0	0	**1,018**
Process and Resources Engineering	432	244	129	2,202	117	0	5	**3,129**
Automotive Engineering & Technology	<5	<5	0	35	0	0	0	**37**
Mech/Industrial Eng & Technology	381	280	61	6,136	233	0	1	**7,093**
Civil Engineering	405	555	79	7,758	237	0	11	**9,045**
Geomatic Engineering	33	106	34	1,111	110	0	1	**1,395**
Electrical/Electronic Eng & Technology	511	508	62	7,213	308	0	11	**8,612**
Aerospace Engineering & Technology	62	81	127	1,518	203	0	7	**1,997**
Maritime Engineering & Technology	18	13	8	186	<5	0	0	**226**
Other Engineering & Related Tech's	462	848	106	8,021	381	15	16	**9,849**
DOMESTIC TOTAL 2020	**2,322**	**2,694**	**608**	**35,028**	**1,686**	**15**	**52**	**42,401**
DOMESTIC TOTAL 2019	2,257	2,700	515	33,969	1,420	17	59	**40,936**
DOMESTIC TOTAL 2018	2,514	2,888	457	33,545	1,390	3	45	**40,839**
DOMESTIC TOTAL 2017	2,721	3,164	469	33,730	1,437	5	61	**41,587**
DOMESTIC TOTAL 2016	2,695	3,249	546	34,783	1,455	7	51	**42,787**
DOMESTIC TOTAL 2015	2,588	3,114	629	35,134	1,521	46	58	**43,087**
DOMESTIC TOTAL 2014	2,378	2,730	746	34,681	1,609	55	69	**42,267**
DOMESTIC TOTAL 2013	2,225	2,399	756	33,571	1,608	62	49	**40,856**
DOMESTIC TOTAL 2012	2,304	2,080	766	31,962	1,563	65	33	**38,890**
DOMESTIC TOTAL 2011	2,273	1,918	673	30,118	1,376	62	25	**36,630**

(b) ALL STUDENT LOAD

Sub-field of education	Doctor-ates	Masters	other p-grad	Bach-elor	other u-grad	Enab	Non award	TOTAL
Manufacturing Engineering & Technology	49	834	3	1,178	120	0	5	**2,188**
Process and Resources Engineering	1,404	1,213	142	3,786	179	0	25	**6,748**
Automotive Engineering & Technology	<5	40	0	69	0	0	0	**109**
Mech/Industrial Eng & Technology	1,033	1,953	73	9,327	350	0	29	**12,766**
Civil Engineering	1,411	3,207	102	11,892	378	0	38	**17,029**
Geomatic Engineering	65	368	41	1,273	126	0	7	**1,880**
Electrical/Electronic Eng & Technology	1,473	3,648	115	10,994	514	0	51	**16,795**
Aerospace Engineering & Technology	114	174	130	2,171	247	0	10	**2,845**
Maritime Engineering & Technology	40	63	9	246	14	0	0	**373**
Other Engineering & Related Tech's	1,276	4,796	138	11,044	728	15	48	**18,045**
TOTAL (ALL STUDENTS) 2020	**6,866**	**16,296**	**753**	**51,980**	**2,656**	**15**	**213**	**78,778**
TOTAL (ALL STUDENTS) 2019	6,721	18,351	664	52,597	2,639	17	420	**81,406**
TOTAL (ALL STUDENTS) 2018	6,786	17,813	563	52,055	2,512	3	358	**80,089**
TOTAL (ALL STUDENTS) 2017	6,661	15,714	594	51,272	2,659	5	378	**77,284**
TOTAL (ALL STUDENTS) 2016	6,440	13,264	662	50,828	2,600	7	723	**74,525**
TOTAL (ALL STUDENTS) 2015	6,207	10,931	749	49,765	2,529	46	975	**71,201**
TOTAL (ALL STUDENTS) 2014	5,904	9,025	876	48,503	2,511	55	1,058	**67,931**
TOTAL (ALL STUDENTS) 2013	5,640	7,192	914	47,220	2,408	62	395	**63,999**
TOTAL (ALL STUDENTS) 2012	5,215	5,913	1,033	44,935	2,275	65	141	**59,802**
TOTAL (ALL STUDENTS) 2011	4,789	5,650	982	42,911	2,089	62	130	**56,816**

TABLE 5 COMMENCING ENROLMENTS (STUDENTS) IN ENGINEERING & RELATED TECHNOLOGIES 2010-20

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
DOCTORATES	**1,476**	**1,528**	**1,629**	**1,789**	**1,834**	**1,870**	**1,833**	**2,140**	**2,080**	**1,919**	**1,726**
domestic number	678	621	601	662	673	718	701	712	589	562	597
% domestic female	24.2%	22.7%	27.6%	25.1%	27.2%	25.2%	24.5%	25.4%	27.5%	29.5%	26.3%
international number	798	907	1,028	1,127	1,161	1,152	1,132	1,428	1,491	1,357	1,129
% international female	24.8%	27.9%	24.8%	26.4%	28.3%	24.7%	27.7%	27.5%	29.2%	27.3%	31.2%
% international	54.1%	59.4%	63.1%	63.0%	63.3%	61.6%	61.8%	66.7%	71.7%	70.7%	65.4%
RESEARCH MASTERS	**521**	**451**	**456**	**433**	**469**	**416**	**375**	**380**	**316**	**329**	**382**
domestic number	303	219	231	234	258	253	214	176	128	120	140
% domestic female	19.5%	21.9%	24.7%	23.5%	19.4%	19.4%	24.3%	24.4%	24.3%	21.7%	25.7%
international number	218	232	225	199	211	163	161	204	188	209	242
% international female	24.8%	28.9%	28.9%	27.6%	26.1%	26.4%	31.1%	26.0%	16.5%	29.7%	26.4%
% international	41.8%	51.4%	49.3%	46.0%	45.0%	39.2%	42.9%	53.7%	59.5%	63.5%	63.4%
COURSEWORK MASTER	**4,311**	**3,997**	**4,448**	**5,372**	**6,560**	**7,564**	**8,787**	**10,032**	**11,035**	**10,949**	**8,106**
domestic number	1,541	1,562	1,690	1,780	2,043	2,091	2,023	1,931	1,671	1,646	2,003
% domestic female	16.7%	17.6%	15.8%	18.7%	19.2%	18.7%	17.5%	17.3%	20.7%	20.7%	19.0%
international number	2,770	2,435	2,758	3,592	4,517	5,473	6,764	8,101	9,364	9,303	6,103
% international female	20.0%	19.4%	18.7%	17.4%	18.6%	20.3%	20.9%	20.2%	19.2%	20.2%	22.5%
% international	64.3%	60.9%	62.0%	66.9%	68.9%	72.4%	77.0%	80.8%	84.9%	85.0%	75.3%
OTHER POSTGRADUATE	**1,447**	**1,511**	**1,448**	**1,416**	**1,247**	**1,021**	**835**	**772**	**639**	**789**	**1,193**
domestic number	1,132	1,101	1,186	1,167	1,118	844	682	594	519	609	1,040
% domestic female	19.8%	21.4%	18.7%	19.6%	16.5%	18.4%	17.3%	19.4%	18.1%	17.2%	21.6%
international number	315	410	262	249	129	177	153	178	120	180	153
% international female	19.4%	13.2%	16.4%	19.3%	16.3%	21.5%	24.8%	19.1%	24.2%	19.4%	21.6%
% international	21.8%	27.1%	18.1%	17.6%	10.3%	17.3%	18.3%	23.1%	18.8%	22.8%	12.8%
BACHELOR	**19,167**	**18,741**	**18,818**	**20,234**	**21,048**	**21,406**	**21,484**	**21,218**	**21,685**	**21,349**	**19,935**
domestic number	12,541	13,152	13,595	14,817	15,085	14,896	14,390	13,736	14,238	14,291	13,938
% domestic female	14.4%	13.9%	13.7%	14.4%	15.1%	15.2%	15.7%	16.9%	18.1%	18.6%	19.8%
international number	6,626	5,589	5,186	5,417	5,963	6,510	7,094	7482	7,447	7,058	5,997
% international female	15.1%	11.9%	17.1%	18.3%	18.4%	21.0%	19.1%	20.3%	18.7%	17.2%	18.2%
% international	34.6%	29.8%	27.8%	26.8%	28.3%	30.4%	33.0%	35.3%	34.3%	33.1%	30.1%
ASSOC DEG & ADV DIP	**1,514**	**1,532**	**1,959**	**2,094**	**1,562**	**1,374**	**1,372**	**1,275**	**1,342**	**1,302**	**1,445**
domestic number	1,357	1,257	1,659	1,890	1,370	1,178	1,136	1,031	1,095	995	1,239
% domestic female	10.0%	8.2%	7.8%	9.3%	8.3%	10.8%	10.1%	10.8%	10.9%	11.6%	14.2%
international number	157	275	300	204	192	196	236	244	247	307	206
% international female	na	7.2%	8.3%	18.6%	4.7%	6.1%	12.7%	10.7%	14.2%	17.9%	15.0%
% international	10.4%	18.0%	15.3%	54.6%	12.3%	14.3%	17.2%	19.1%	18.4%	23.6%	14.3%
ENABLING & OTHER	**859**	**1,434**	**1,307**	**1,841**	**2,144**	**1,988**	**2,249**	**2,304**	**2,263**	**2,393**	**1,943**
domestic number	798	811	748	836	909	564	655	631	616	687	943
% domestic female	24.4%	45.3%	32.8%	28.1%	19.4%	14.5%	20.0%	n/a	10.6%	12.1%	13.3%
international number	61	623	559	1,005	1,235	1,424	1,594	1,673	1,647	1,706	1,000
% international female	12.7%	1.8%	8.8%	8.2%	9.7%	10.5%	12.7%	13.8%	12.6%	12.7%	13.0%
% international	37.6%	43.4%	42.8%	0.0%	57.6%	71.6%	70.9%	72.6%	72.8%	71.3%	51.5%
ALL COMMENCEMENTS	**28,975**	**29,199**	**30,065**	**33,179**	**34,864**	**35,639**	**36,935**	**38,121**	**39,360**	**39,030**	**34,730**
domestic number	18,352	18,813	19,710	21,386	21,456	20,544	19,801	18,811	18,856	18,910	19,900
% domestic female	15.8%	15.3%	15.0%	15.6%	15.8%	15.8%	16.1%	16.7%	18.0%	18.4%	19.4%
international number	10,623	10,386	10,355	11,793	13,408	15,095	17,134	19,310	20,504	20,120	14,830
% international female	18.5%	18.1%	17.8%	18.1%	18.4%	19.9%	19.9%	20.2%	19.3%	19.0%	20.7%
% international	36.7%	35.6%	34.4%	35.5%	38.5%	42.4%	46.4%	50.7%	52.1%	51.6%	42.7%

TABLE 6 DOMESTIC COMMENCING ENROLMENTS (ALL AWARD LEVELS) IN ENGINEERING & RELATED TECHNOLOGIES AND OTHER SELECTED FIELDS, 2010-20

year	Engineering & Related Technologies	% of total	Health	Natural & Physical Science	Information Technology	Law, Business, Society, Creative Arts (several FoEs)	total commencing award programs
2010	18,172	5.5%	54,097	26,619	8,704	175,649	**329,248**
2011	18,813	5.6%	56,628	28,169	9,263	179,222	**338,188**
2012	19,710	5.4%	61,864	31,847	10,060	190,917	**364,197**
2013	21,433	5.6%	66,827	33,163	10,292	201,234	**384,251**
2014	21,456	5.3%	71,419	34,064	11,187	209,246	**401,356**
2015	20,544	5.2%	75,170	33,639	11,488	209,164	**397,296**
2016	19,902	4.9%	80,364	35,682	12,347	208,351	**405,085**
2017	18,816	4.6%	82,657	36,235	14,223	210,302	**410,167**
2018	18,941	4.6%	82,995	36,828	14,902	204,902	**409,594**
2019	19,005	4.7%	81,390	36,521	15,365	202,993	**408,222**
2020	**19,070**	**4.2%**	**89,383**	**33,676**	**18,638**	**204,421**	**449,723**

TABLE 7 DOMESTIC BACHELOR DEGREE COMMENCING ENROLMENTS, ALL FIELDS OF EDUCATION, 2011-20

Field of Education	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Natural & Physical Sciences	24,024	27,225	28,220	29,088	28,380	30,289	30,815	31,045	30,665	30,104
Information Technology	6,913	7,492	7,541	8,502	8,866	9,169	10,567	10,851	10,898	12,092
Engineering & Rel'd Technologies	**13,156**	**13,602**	**14,837**	**15,074**	**14,914**	**14,375**	**13,726**	**14,283**	**14,272**	**13,938**
Architecture & Building	5,900	6,064	5,953	5,878	6,350	6,692	6,727	7,337	7,647	7,999
Agriculture, Envir'l &Related Studies	3,657	3,748	3,900	3,584	3,370	3,481	3,098	3,096	3,187	3,881
Health	37,694	41,247	46,584	49,394	52,901	55,450	56,843	57,838	55,052	55,993
Education	22,170	24,783	25,225	26,466	25,382	23,845	23,708	21,553	21,326	22,192
Management & Commerce	37,233	41,169	42,792	47,200	45,968	45,395	44,943	43,838	41,003	39,083
Society & Culture	59,058	63,620	67,588	69,204	70,416	69,953	70,937	69,322	67,852	70,847
Creative Arts	21,350	22,216	24,794	24,739	24,861	24,171	23,711	22,388	22,258	21,742
Food. Hospitality & Personal Services	18	36	19	15	16	9	4		3	2
TOTAL	**213,418**	**233,154**	**248,747**	**259,107**	**260,486**	**261,287**	**262,698**	**259,495**	**252,179**	**256,728**
Proportion in Engineering, %	**6.2%**	**5.8%**	**6.0%**	**5.8%**	**5.7%**	**5.5%**	**5.2%**	**5.5%**	**5.7%**	**5.4%**

TABLE 8 ADMISSION PROFILES OF DOMESTIC STUDENTS COMMENCING UNDERGRADUATE AWARD PROGRAMS IN ENGINEERING & RELATED TECHNOLOGIES 2011-20

(a) Basis of Admission into Bachelor Degrees, 2011- 20

Year	Total	Higher Ed completed/in-complete in Aus. or o/s	TAFE/VET award completed or incomplete	Completion of final year of secondary schooling, in school or TAFE (Aus or o/s)	Other
2011	13,154	2,435	978	8,542	1,181
2012	13,595	2,604	904	8,835	1,252
2013	14,817	2,989	1,184	9,119	1,525
2014	15,085	3,665	1,013	8,791	1,534
2015	14,896	3,357	964	8,686	1,889
2016	14,390	3,323	1,046	8,332	1,689
2017	13,736	2,978	897	8,461	1,400
2018	14,228	2,989	872	9,027	1,340
2019 total	14,291	2,936	907	9,024	1,424
2019 females	2,661	523	112	1,823	203
2020 total	**13,993**	**3,074**	**772**	**8,592**	**1,495**
2020 females	**2.755**	**617**	**88**	**1,849**	**201**
	AS PERCENTAGES				
2011		18.5%	7.4%	64.9%	9.0%
2012		19.2%	6.6%	65.0%	9.2%
2013		20.2%	8.0%	61.5%	10.3%
2014		24.3%	6.7%	58.3%	10.2%
2015		22.5%	6.5%	58.3%	12.7%
2016		23.1%	7.3%	57.9%	11.7%
2017		21.7%	6.5%	61.6%	10.2%
2018		21.0%	6.1%	63.4%	9.4%
2019 total		20.5%	6.3%	63.1%	10.0%
2019females		19.7%	4.2%	68.5%	7.7%
2020 total		**22.1%**	**5.5%**	**61.7%**	**10.7%**
2020 females		**22.4%**	**3.2%**	**67.1%**	**7.3%**

'Other' covers admission on the basis of 'mature age special provisions', 'professional qualifications', and 'other'

(b) Distributions of Undergraduate Offers in ATAR bands to school leavers in Engineering and other selected fields, 2020 (and previous years for Engineering)

field of education	< 50	50.05 – 60.00	60.05 – 70.00	70.05 – 80.00	80.05 – 90.00	> 90.05	Number of ATAR offers	% of ATAR offers
Natural & Physical Sciences	3.1%	5.3%	10.0%	16.8%	27.2%	37.6%	15,002	49.3%
Information Technology	8.9%	13.1%	20.0%	22.2%	21.0%	14.9%	3,932	41.6%
Engineering 2020	**2.7%**	**4.9%**	**9.7%**	**16.9%**	**26.5%**	**39.2%**	**9,420**	**58.4%**
Engineering 2019	1.8%	3.6%	7.8%	17.6%	27.3%	41.7%	9,146	57.6%
Engineering 2018	2.0%	4.2%	8.2%	17.9%	27.1%	40.6%	9,921	58.4%
Engineering 2017	2.0%	3.4%	8.5%	15.0%	30.1%	41.1%	9,619	57.8%
Health	5.6%	9.8%	16.7%	21.3%	24.0%	22.6%	20,308	31.7%
Management & Commerce	6.9%	10.5%	15.6%	19.5%	22.3%	25.1%	15,456	46.0%
All fields	**6.4%**	**9.8%**	**15.4%**	**19.9%**	**23.6%**	**24.9%**	**107,424**	**38.1%**

TABLE 9 TOP 16 COUNTRIES OF ORIGIN OF ONSHORE COMMENCING ENROLMENTS IN ENGINEERING & RELATED TECHNOLOGIES, 2019 and 2020, BY BROAD PROGRAM LEVEL

YEAR/country	P/G Research & Coursew'k	Bachelors (inc Hons)	Other	Total	P/G Research & Coursew'k	Bachelors (inc Hons)	Other	Total	overall rank
2019									
China (excludes SARs and Taiwan Province)	3,113	1,646	501	5,260	34.5%	35.2%	31.4%	34.4%	**1**
India	3,380	495	145	4,020	37.5%	10.6%	9.1%	26.3%	**2**
Pakistan	350	188	185	723	3.9%	4.0%	11.6%	4.7%	**3**
Sri Lanka	187	366	79	632	2.1%	7.8%	4.9%	4.1%	**4**
Viet Nam	116	294	79	444	1.3%	5.3%	4.9%	2.9%	**5**
Nepal	243	124	30	419	3.4%	1.8%	1.7%	2.7%	**6**
Saudi Arabia	88	248	50	386	1.0%	5.3%	3.1%	2.5%	**7**
Malaysia	91	262	35	383	1.0%	5.6%	1.9%	2.5%	**8**
Bangladesh	161	100	34	295	1.8%	2.1%	2.1%	1.9%	**9**
Indonesia	97	102	81	280	1.1%	2.2%	5.1%	1.8%	**10**
Hong Kong (SAR)	25	149	32	206	0.3%	3.2%	2.0%	1.3%	**11**
Iran	154	14	6	174	1.7%	0.3%	0.4%	1.1%	**12**
Singapore	11	80	13	104	0.1%	1.7%	0.8%	0.7%	**13**
Thailand	46	43	14	103	0.5%	0.9%	0.9%	0.7%	**14**
Kuwait	11	26	6	43	0.1%	0.6%	0.4%	0.3%	**15**
Iraq	< 5	< 5	0	5	0	0	0.0%	0.0%	**16**
All other Countries	872	619	315	1,806	9.7%	13.2%	19.7%	11.8%	
Total on-shore	**9,012**	**4,674**	**1,597**	**15,283**					
Total international (from Table 5)	**11,049**	**7,058**	**2,013**	**20,120**					
2020									
China (excludes SARs and Taiwan Province)	1,927	1,033	164	3,124	37.7%	30.9%	21.8%	33.9%	**1**
India	1,487	300	45	1,832	29.1%	9.0%	6.0%	19.9%	**2**
Pakistan	243	161	83	487	4.8%	4.8%	11.0%	5.3%	**3**
Sri Lanka	131	283	31	445	2.6%	8.5%	4.1%	4.8%	**4**
Viet Nam	109	218	67	394	2.1%	6.5%	8.9%	4.3%	**5**
Malaysia	65	151	18	234	1.3%	4.5%	2.4%	2.5%	**6**
Nepal	104	82	22	208	2.0%	2.5%	2.9%	2.3%	**7**
Bangladesh	87	96	17	200	1.7%	2.9%	2.3%	2.2%	**8**
Indonesia	56	116	18	190	1.1%	3.5%	2.4%	2.1%	**9**
Saudi Arabia	59	99	26	184	1.2%	3.0%	3.4%	2.0%	**10**
Hong Kong (SAR of China)	25	129	15	169	0.5%	3.9%	2.0%	1.8%	**11**
Iran	89	12	<5	102	1.7%	0.4%	0.1%	1.1%	**12**
Thailand	35	30	8	73	0.7%	0.9%	1.1%	0.8%	**13**
Singapore	10	55	5	70	0.2%	1.6%	0.7%	0.8%	**14**
Kuwait	5	21	<5	27	0.1%	0.6%	0.3%	0.3%	**15**
Iraq	<3	0	0	3	0.1%	0.0%	0.0%	0.0%	**16**
All other Countries	671	556	754	1,460	13.1%	16.6%	30.9%	15.9%	
Total on-shore	**5,106**	**3,342**	**754**	**9,202**					
Total international (from Table 5)	**7,627**	**5,997**	**1,206**	**14,830**					

TABLE 10 INDIGENOUS COMMENCEMENTS AND COMPLETIONS IN ENGINEERING & RELATED TECHNOLOGIES, 2017, 2019 and 2020

Commencements

State/ Territory	Postgraduate (Res & Cswk)	Bach. (inc Hons)	Other award	Totals		
	Persons	Persons	Persons	Male	Female	Persons
2017						
ACT	< 5	0	0	0	< 5	< 5
NSW	9	38	<< 10	42	8	50
NT	0	<5	<< 10	< 5	< 5	< 5
QLD	< 5	65	7	58	18	76
SA	< 5	10	< 5	13	< 5	14
TAS	< 5	5	0	6	0	6
VIC	< 5	12	<< 10	15	< 5	17
WA	< 5	12	0	9	5	14
Totals	**21**	**143**	**< 19**	**146**	**36**	**182**
2019						
ACT	0	< 5	0	< 5	0	< 5
NSW	<5	51	<<10	50	10	60
NT	0	<5	<<10	7	<5	11
QLD	6	49	13	52	16	68
SA	0	6	<<10	10	<5	12
TAS	0	<5	0	<5	0	<5
VIC	6	17	6	28	<5	29
WA	0	6	0	5	<5	6
Totals	**16**	**137**	**38**	**156**	**35**	**191**
2020						
ACT	< 5	< 5	0	<5	<5	<5
NSW	11	58	6	62	13	75
NT	0	< 5	<5	<5	<5	5
QLD	8	57	26	74	17	91
SA	< 5	7	<10	13	<5	16
TAS	0	5	<5	7	<5	8
VIC	7	12	5	19	5	24
WA	< 5	7	<5	7	<5	10
Totals	**33**	**151**	**49**	**188**	**45**	**233**

Completions

State/ Territory	Postgraduate (Res & Cswk)	Bach. (inc Hons)	Other award	Totals		
	Persons	Persons	Persons	Male	Female	Persons
2017						
ACT	0	0	0	0	0	0
NSW	< 5	8	< 5	9	<5	12
NT	0	0	0	0	0	0
QLD	< 5	19	<5	23	<5	25
SA	0	< 5	<5	< 5	0	< 5
TAS	0	< 5	< 5	< 5	0	< 5
VIC	0	< 5	0	< 5	0	< 5
WA	< 5	<5	0	5	0	5
Totals	**8**	**34**	**< 10**	**45**	**5**	**50**
2019						
ACT	0	0	0	0	0	0
NSW	<5	7	<5	10	<5	13
NT	0	0	<5	<5	0	<5
QLD	<5	14	<<10	17	6	23
SA	0	6	0	6	0	6
TAS	0	<5	0	<5	0	<5
VIC	<5	6	<<10	8	<5	10
WA	<5	<5	0	<5	<5	<5
Totals	**8**	**37**	**13**	**46**	**12**	**58**
2020						
ACT	<5	0	0	0	<5	<5
NSW	5	15	<<10	19	<5	22
NT	0	0	0	0	0	0
QLD	<5	22	<<10	25	<5	29
SA	0	<5	0	<5	0	<5
TAS	0	<5	0	<5	0	<5
VIC	<5	<5	<5	6	0	6
WA	<5	<5	<<10	<5	<5	5
Totals	**14**	**47**	**<<10**	**57**	**11**	**68**

Note: numbers between 1 and 4 are suppressed to '<5' to avoid identification of individuals. Where two '<5' data entries have been summed for this Table, the result is represented as '<<10'.

TABLE 11 STUDENT, GRADUATE, AND EMPLOYER SATISFACTION

(a) Undergraduate student satisfaction surveys, 2019 and 2020

Percentages of students expressing agreement or strong agreement with a relevant satisfaction statement

Year of graduation field of education	Skills Development	Learner Engagement	Teaching Quality	Student Support	Learning Resources	Overall Experience
2019						
Science & mathematics	80	61	83	75	88	80
Computing & Info Syst.	74	58	74	73	81	72
Engineering	**78**	**65**	**75**	**71**	**84**	**73**
All fields	**81**	**60**	**81**	**74**	**84**	**78**
2020						
Science & mathematics	75	42	79	73	78	67
Computing & Info Syst.	72	46	71	70	70	62
Engineering	**75**	**48**	**71**	**69**	**72**	**61**
All Fields	**78**	**44**	**78**	**74**	**76**	**69**

(b) Postgraduate coursework student satisfaction surveys, 2019 and 2020

Percentages of students expressing agreement or strong agreement with a relevant satisfaction statement

Year Field of education	Skills Development	Learner Engagement	Teaching Quality	Student Support	Learning Resources	Overall Experience
2019						
Engineering	**80**	**59**	**78**	**75**	**88**	**74**
All fields	81	54	81	73	83	76
2020						
Engineering	**76**	**45**	**72**	**72**	**70**	**62**
All Fields	78	42	78	74	73	69

(c) Graduate satisfaction surveys, 2019 and 2020 graduates

Percentages of graduates expressing agreement or strong agreement with a relevant satisfaction statement

Year of graduation Level and field of education	Overall satisfact	Good teaching	Generic skills	Super-vision	Intellect'l climate	Skills develop't	Infra-structre	Thesis examin'n	Goals & expect's	Ind. & ext. eng
2019										
U/G Engineering	**75.3**	**49.4**	**83.8**							
Science & Mathematics	84.1	67.5	85.7							
Computing & Info Syst.	74.2	59.7	77.6							
Pharmacy	83.7	64.6	80.8							
Business & Management	78.6	58.6	79.7							
U/G All fields	**80.7**	**63.7**	**82.4**							
P/G Coursework Eng.	**76.9**	**63**	**82**							
P/G Coursework All fields	**81.7**	**69.4**	**79.7**							
P/G Research Eng.	**87.5**			**79.9**	**69.3**	**93.2**	**81.9**	**82.3**	**92.2**	**66.7**
P/G Research All fields	85.8			82.3	64.4	92.5	76.8	81.5	91.3	57.9
2020										
U/G Engineering	**72.3**									
Science & Mathematics	82.6									
Computing & Info Syst.	72.5									
Pharmacy	84.2									
Business & Management	76.5									
U/G All fields	**77.9**									
P/G Coursework Eng.	**74.6**									
P/G Coursework All fields	**79.8**									
P/G Research Eng.	**84.7**			**81.5**	**68.7**	**93.1**	**83.1**	**82.2**	**93.1**	**64.6**
P/G Research All fields	84.8			83.1	64.4	94.5	78.8	82.4	93.0	57.1

(d) Employer Satisfaction Surveys, for graduates from 2017-20 – skills areas, selected fields of education.
Percentages of employers expressing agreement or strong agreement with a relevant statement on graduate skills. Previous year data in parentheses.

Year of graduation Field of education	Foundation	Adaptive	Collaborative	Technical	Employability	Overall satisfaction
2017 All fields	93.4	90.1	85.9	93.3	85.0	83.6
2018 All fields	93.5	89.9	88.7	93.8	86.5	84.8
2019 All fields	**92.7**	**89.3**	**87.8**	**92.7**	**85.4**	**84.0**
2020 All fields	**93.5**	**90.3**	**89.3**	**93.7**	**86.6**	**85.3**
Engineering & Related Technologies	**95.5 (97.1)**	**91.7 (90.4)**	**92.7 (91.7)**	**93.8 (97.1)**	**84.9 (88.2)**	**90.4 (89.9)**
Natural & Physical Sciences	91.6 (95.4)	89.7 (91.2)	90.9 (92.2)	92.0 (94.3)	85.9 (90.0)	83.6 (82.8)
Information Technology	93.5 (91.5)	91.0 (86.9)	92.7 (87.9)	92.4 (92.3)	86.9 (82.1)	81.4 (89.9)
Health	93.6 (93.9)	89.1 (90.1)	88.6 (88.1)	95.0 (94.4)	84.7 (84.1)	89.2 (86.9)
Management & Commerce	95.0 (92.5)	91.1 (89.3)	91.6 (87.8)	94.2 (92.7)	90.3 (85.4)	84.5 (84.0)

(e) Employer Satisfaction Survey, for 2019 and 2020 graduates, selected fields of education
Ratings by graduates and their supervisors. Previous year data in parentheses.

Field of education	% of respondents rating qualification 'important' or 'very important' for current employment		% of respondents rating 'well' or 'very well' the extent to which qualification prepared graduates for current employment	
	Graduates	Supervisors	Graduates	Supervisors
All fields	**51.0 (53.2)**	**60.4 (62.2)**	**84.6 (87.1)**	**92.1 (92.2)**
Engineering & Related Technologies	**54.1 (59.2)**	**66.0 (67.7)**	**82.3 (87.5)**	**91.8 (92.7)**
Natural & Physical Sciences	43.3 (47.2)	51.4 (60.1)	78.4 (81.8)	88.4 (93.7)
Information Technology	42.3 (41.1)	46.5 (48.4)	80.5 (84.4)	87.2 (90.4)
Health	66.0 (70.2)	77.0 (79.2)	91.6 (90.0)	95.2 (94.9)
Management & Commerce	37.2 (42.3)	45.9 (48.1)	83.6 (87.7)	92.7 (92.1)

TABLE 12 GRADUATE OUTCOMES: EMPLOYMENT STATUS AND MEDIAN SALARIES

(a) Short-term employment status, short-term surveys of graduates from 2018-20

Year of Graduation Level and field	% in full-time study	% in work, of all avail-able for any work	% in FT work, of all avail-able for FT work	% in PT work, of all employ ed	% in PT work seeking more hours	% in PT work not seeking more hours	% of FT employed reporting skills not fully used		% of all employed reporting skills not fully used	
							in general	because of lack of jobs in area of expertise	in general	because of lack of jobs in area of expertise
2018										
U/G Engineering	12.8	88.4	84.8	14.6	8.1	4.6	19.8	22.0	26.6	19.8
ALL U/G	18.9	86.8	72.2	38.1	19.8	14.1	28.3	20.8	40.4	19.6
P/G C'swk Engin'g		89	85				28.7	24.7	32.2	25.1
ALL P/G Coursew'k	6.0	92.7	86.8				26.6	19.6	29.0	20.0
P/G Res'ch Engin'g	-	87	80				20.9	39.7	24.0	35.4
All Research	5.8	90.7	81.1				25.8	37.5	29.5	36.4
2019										
U/G Engineering	11.1	87.6	83.0	14	8	4	21	18	27	21
ALL U/G	18.5	85.1	68.7	41.0	21.8	16.5	28.1	20.1	40.9	19.5
P/G C'swk Engin'g	-	89	86				31	18	34	11
ALL P/G Coursew'k	6.6	91.6	85.6				27.2	17.3	29.9	18.3
P/G Res'ch Engin'g	-	86	81				26	32	27	32
All Research	6.9	90.0	80.1				25.6	30.0	28.2	32.2
2020										
U/G Engineering	14	87	80	18	9	7	22	9	30	10
ALL U/G	21.1	84.8	68.9	41.5	19.3	16.1	29.3	10.2	42.3	11.4
P/G C'swk Engin'g	6	89	87				36	16	37	17
ALL P/G Coursew'k	7.6	91.6	84.9				28.7	10.8	31.5	11.6
P/G Res'ch Engin'g	8	81	74				22	20	27	nd
All Research	6.8	88.1	77.7				2.96	25.1	29.9	27.9

(b) Short-term graduate salaries (medians) for full-time work, graduates from 2017-20

Program level and field	2017		2018		2019		2020	
	male	female	male	female	male	female	male	female
U/G Engineering	$ 65,000	$ 65,000	$ 67,800	$ 67,000	$ 69,400	$ 70,000	$ 70,000	$ 70,000
ALL U/G	$ 63,000	$ 60,000	$ 64,700	$ 61,500	$ 65,000	$ 63,400	$ 66,800	$ 64,200
P/G Coursework Engineering	$ 90,000	$ 79,100	$ 87,500	$ 80, 000	$ 100,000	$ 93,000	$ 100,000	$ 78,000
ALL P/G	$ 92,500	$ 79,000	$ 95,000	$ 81,300	$ 96,000	$ 85,300	$ 99,000	$ 85,000
P/G Research Engineering	$ 90,000	$ 83,000	$ 90,000	$ 90,500	$ 93,900	$ 90,800	$ 89,600	$ 90,000
ALL P/G Research	$ 90,200	$ 90,000	$ 92,000	$ 90,000	$ 95,000	$ 91,900	$ 96,000	$ 93,900

Note: undergraduate figures are for graduates in first full time employment, age less than 25

(c) Short-term median salary comparisons, undergraduate degrees, graduates form 2014-20

Program field	2014	2015	2016	2017	2018	2019	2020
Dentistry	$ 80,000	$ 83,500	$ 78,300	$ 83,700	$ 88,200	$ 84,000	$ 100,000
Medicine	$ 65,000	$ 69,200	$ 70,300	$ 73,000	$ 73,100	$ 75,000	$ 76,000
Engineering	**$ 60,000**	**$ 62,600**	**$ 64,000**	**$ 65,000**	**$ 67,500**	**$ 69,500**	**$ 70,000**
Computing & Information Systems	$ 54,000	$ 60,000	$ 59,900	$ 60,000	$ 64,000	$ 65,000	$ 65,500
Science & Mathematics	$ 60,000	$ 55,200	$ 57,500	$ 61,000	$ 60,000	$ 64,000	$ 63,000
Business & Management	$ 50,000	$ 55,000	$ 55,200	$ 58,000	$ 59,500	$ 60,000	$ 60,700

(d) Longitudinal employment surveys, 2017 graduates surveyed in 2018 and resurveyed in 2021

Level measure	Engineering, 2018 - 21 short	 medium	All fields, 2018 - 21 short	 medium	gain for Engineering (2018 to 21)	gain for All fields (2018 to 21)
Undergraduate						
F/T employment	84.7%	95.0%	74.3%	88.9%	10.3%	14.6%
Overall Employment	87.0%	96.0%	87%	93%	9.0%	6%
Median Salary	$ 65,000	$ 84,000	$ 60,000	$ 75,000	$ 19,000	$15,000
Roles (of Overall Employed)						
managers	3.4%	6.3%	6.2%	6.7%	2.9%	0.5%
professionals	69.7%	73.8%	56.1%	67.0%	4.1%	10.9%
other	20.7%	14.2%	37.7%	26.3%	-6.5%	- 11.4%
Postgraduate Coursework						
F/T employment	84.1%	93.8%	86.6%	93.3%	9.7%	6.7%
Overall Employment	88.9%	95.4%	92.9%	95.8%	6.5%	2.9%
Median Salary	$ 88,200	$ 110,000	$ 83,600	$ 100,000	$ 21,800	$16,400
Roles (of Overall Employed)						
managers	13.7%	20.6%	14.9%	17.0%	6.9%	2.1%
professionals	67.2%	64.3%	70.7%	69.9%	-2.9%	-0.8%
other	20.2%	17.2%	14.4%	13.1%	-3.0%	-1.3%
Postgraduate Research						
F/T employment	85.0%	91.5%	82.5%	90.3%	16.5%	7.8%
Overall Employment	90.0%	100.0%	91.9%	92.4%	10.0%	0.5%
Median Salary	$ 93,000	$ 100,000	$ 90,000	$ 102,000	$ 7,000	$12,000
Roles (of Overall Employed)						
managers	9.0%	7.1%	7.1%	8.8%	2.1%	1.7%
professionals	82.9%	83.0%	85.0%	82.6%	-0.1%	-2.4%
other	8.1%	9.8%	7.9%	8.6%	1.7%	0.7%

TABLE 13 ACADEMIC STAFF (FTE) IN ENGINEERING & RELATED TECHNOLOGIES, MAJORITY OF ACED MEMBERS (see note), 2010-20 (not including casual staffing)

(a) Academic staff (FTE) by gender and function

staff categories	2010	2011	2012	2013	2014*	2015	2016	2017	2018	2019	2020*
academics, male											
teaching-only	69	100	98	76	67	88	127	121	130	135	158
research –only	1,051	1,194	1,194	1,295	1,279	1,417	1,344	1,304	1,326	1,419	1,546
teaching & research	1,602	1,747	1,759	1,755	1,824	1,919	1,907	1,839	1,639	1,642	1,851
sub-total, male	**2,722**	**3,040**	**3,052**	**3,126**	**3,170**	**3,424**	**3,378**	**3,264**	**3,095**	**3,196**	**3,555**
academics, female											
teaching-only	13	16	20	18	17	24	33	38	43	55	60
research –only	333	387	383	399	371	399	360	366	356	369	422
teaching & research	236	252	248	257	288	320	328	307	310	304	385
sub-total, female	**621**	**656**	**652**	**675**	**676**	**743**	**721**	**711**	**709**	**728**	**867**
total academics	**3,343**	**3,696**	**3,704**	**3,801**	**3,846**	**4,167**	**4,099**	**3,975**	**3,804**	**3,924**	**4,422**
% research-only	41.4%	42.8%	42.6%	44.6%	42.9%	43.6%	41.6%	42.0%	44.2%	45.6%	44.5%
% female	18.6%	17.7%	17.6%	17.8%	17.6%	17.8%	17.6%	17.9%	18.6%	18.6%	19.6%
total teaching	**1,920**	**2,115**	**2,125**	**2,106**	**2,196**	**2,351**	**2,395**	**2,305**	**2,122**	**2,136**	**2,454**

***** Up to 2019, 26 of the 35 ACED member universities provided staff data for FoE3 to the Higher Education Statistics Unit. In 2020, the aggregated data include those from one more institution, a large provider with 209 teaching & research and 101 research-only staff FTE in Engineering.

Including the eight universities that did not report their engineering staff against FoE03 separately, the total FTE in Engineering for 2020 are estimated to be approx. 2,620 (teaching/teaching & research) and 2,000 (research-only).

(b) Academic staff (FTE) by gender and level of appointment for ACED member universities*, 2013-20

Year, gender and role		D, E	C	B	< B	other
2013	**Men**	907	692	796	553	178
	Women	104	104	204	169	95
2014	**Men**	951	675	826	537	184
	Women	115	111	201	156	85
2015	**Men**	1031	751	908	636	99
	Women	127	132	212	201	61
2016	**Men**	1078	735	867	618	80
	Women	145	132	198	191	56
2017	**Men**	1061	693	764	663	83
	Women	132	129	195	208	47
2018	**Men**	989	651	696	689	73
	Women	132	127	215	196	38
2019	**Men, Total**	1026	657	708	735	69
	Women, Total	148	117	222	202	38
	Men, Research	172	125	404	649	69
	Women, Research	28	34	95	174	38
2020	**Men, Total**	1136	724	805	804	86
	Women, Total	191	141	268	222	45
	Men, Research	157	126	455	723	86
	Women, Research	33	40	109	195	45

TABLE 14 SUMMARY ENROLMENTS, COMPLETIONS AND LOAD DATA FOR ACED MEMBERS, 2020

University	Commencing students					Completions			Total enrolled students			Load
	domestic		international		total	dom	int'nat	total	dom	int'nat	total	EFTSL
	#	% fem	#	% fem								
Charles Sturt Uni	65	30.8%	0		**65**	30	<5	**32**	152	-	**152**	87
Macquarie Uni	377	8.7%	251	17.1%	**628**	117	135	**252**	1,049	645	**1,0694**	845
Southern Cross Uni	130	30.0%	45	20.0%	**175**	36	37	**73**	253	183	**436**	153
The Uni of Newcastle	599	15.7%	156	26.9%	**755**	272	145	**417**	2,043	680	**2,723**	1,949
The Uni of Sydney	862	31.4%	1,155	34.8%	**2,017**	411	749	**1,160**	3,164	3,272	**6,436**	4,880
UNSW (inc. Canberra)	1,683	22.8%	1,641	26.3%	**3,324**	1,194	1,890	**3,084**	5,693	6,071	**11,764**	8,037
Uni of Tech Sydney	1,119	25.5%	707	14.7%	**1,826**	540	749	**1,289**	4,415	2,265	**6,680**	5,528
Uni of Wollongong	397	16.1%	512	19.7%	**909**	294	549	**843**	1,589	1,675	**3,264**	2,285
Western Sydney Uni	638	12.4%	249	12.0%	**887**	190	285	**475**	2,110	1,041	**3,151**	3,116
Deakin University	329	12.8%	391	15.1%	**720**	102	489	**591**	1,240	1,652	**2,892**	1,928
Federation Uni Aust	126	5.6%	113	10.6%	**239**	62	54	**116**	364	370	**734**	382
La Trobe University	107	9.3%	138	13.0%	**245**	70	154	**224**	277	540	**817**	673
Monash University	863	23.8%	1,264	22.9%	**2,127**	469	1,081	**1,550**	3,973	4,885	**8,858**	5,725
RMIT University	1,994	16.2%	1,512	16.1%	**3,506**	1,122	1,300	**2,422**	5,826	4,984	**10,810**	7,176
Swinburne U of Tech	852	18.4%	681	17.3%	**1,533**	530	938	**1,468**	3,141	2,908	**6,049**	4,275
The Uni of Melbourne	394	22.8%	676	32.2%	**1,070**	423	919	**1,342**	1,171	2,389	**3,560**	3,304
Victoria University	130	7.7%	114	7.0%	**244**	69	120	**189**	434	417	**851**	868
CQ University	427	16.6%	76	11.8%	**503**	183	229	**412**	1,208	470	**1,678**	965
Griffith University	611	16.7%	253	20.9%	**864**	333	214	**547**	1,821	794	**2,615**	1,619
James Cook University	109	20.2%	53	9.4%	**162**	100	21	**121**	427	133	**560**	378
Queensland U of Tech	905	16.0%	235	20.9%	**1,140**	441	252	**693**	3,579	904	**4,483**	2,932
The Uni of Queensl'nd	798	23.1%	536	22.0%	**1,334**	587	404	**991**	3,649	1,733	**5,382**	4,134
Uni of Southern Qld	997	15.4%	82	15.9%	**1,079**	440	128	**568**	3,329	348	**3,677**	1,479
Uni of Sunshine Coast	147	15.6%	11	0.0%	**158**	21	8	**29**	444	44	**488**	236
Curtin Uni of Tech	831	16.2%	575	17.7%	**1,406**	431	599	**1,030**	2,945	2,462	**5,407**	3,621
Edith Cowan Uni	237	16.5%	399	19.3%	**636**	91	366	**457**	676	1,365	**2,041**	1,209
Murdoch University	129	24.8%	55	9.1%	**184**	69	38	**107**	371	169	**540**	286
The University of WA	254	20.5%	225	24.4%	**479**	299	231	**530**	857	727	**1,584**	1,649
Flinders University	258	19.8%	96	22.9%	**354**	118	41	**159**	719	237	**956**	711
The Uni of Adelaide	694	20.9%	539	23.2%	**1,233**	431	545	**976**	2,295	1,794	**4,089**	2,583
Uni of South Australia	362	16.9%	459	20.5%	**821**	273	369	**642**	1,187	1,315	**2,502**	1,693
Uni of Tasmania	377	13.8%	170	18.2%	**547**	184	203	**387**	904	575	**1,479**	948
Charles Darwin Uni	141	21.3%	100	28.0%	**241**	40	59	**99**	363	236	**599**	346
The Aust National Uni	380	30.5%	183	23.0%	**563**	119	170	**289**	1,023	724	**1,747**	865
Uni of Canberra	92	14.1%	19	47.4%	**111**	20	<5	**24**	175	42	**217**	198
TOTAL 2020	**18,414**	**19.2%**	**13,671**	**21.7%**	**32,085**	**10,111**	**13,477**	**23,588**	**62,866**	**48,049**	**110,915**	**77,063**
TOTAL 2019	17,631	18.9%	18,425	20.0%	36,056	10,627	13,508	24,135	61,621	52,803	114,424	79,778
% change 2019 to 2020	4.4%	0.7%	-25.8%	1.70%	11.0%	-4.8%	-0.2%	-2.2%	2.0%	-9.0%	-3.1%	-3.4%

Notes

Data source: Higher Education Statistics pivot tables for FoE03 Engineering and Related Technologies.
Engineering and Related Technologies includes surveying, maritime, and civil aviation, but may not include software engineering.
UNSW Sydney and UNSW Canberra are separate ACED members, but their DESE data are combined.
Totals are a few percent less than those in Tables 1, 3 and 6 because of non-inclusion of private HE and VET/TAFE providers.

University Group members of ACED (referred to in Section 10)

Group of Eight: Adelaide U, ANU, Monash U, Uni of Melbourne, Uni of Queensland, Uni of Sydney, UNSW, UWA
Australian Technology Network: Curtin U, Deakin U, RMIT U, Uni of Newcastle, Uni of SA, Uni of Tech Sydney
Innovative Research Universities: Charles Darwin U, Flinders U, Griffith U, James Cook U, La Trobe U, Murdoch U, Uni of Canberra, Wester Sydney U.
Regional Universities Network: Charles Sturt U, CQ University, Federation U, Southern Cross U, Uni of Southern Queensland, Uni of Sunshine Coast
Other: Edith Cowan U, Macquarie U, Queensland Uni of Tech, Swinburne Uni of Tech, Uni of Tasmania, Victoria U, Uni of Wollongong

TABLE 15 NUMBER OF COURSEWORK PROGRAMS OFFERED IN AUSTRALIA BY ACED MEMBERS, MAR 2022

University (ACED member)	# of camp-uses	EA accredited programs					advanced "MEngSci" awards	"M-mgt" awards
		Assoc Deg /Adv Dip	BEngTech	BEng(Hons)	options	MEng branches		
Charles Sturt U	1	-	1 P	-	-	1 P	-	-
Macquarie U	1	-	-	3 F, 1 P	3D	-	1	1
Southern Cross U	1	1 P	-	1 F, 2 P	-	-	1	1
UNSW (Sydney)	1	-	-	23F, 2 P	8D	6 F, 4 P	24	2
U of Newcastle	1	-	-	8 F, 2 P	4D	8 P	1	1
U of Wollongong	1	-	-	9 F, 1P	7D, A	5 F, 5 P	5	1
U of Sydney	1	-	-	8 F	6D	10 F, 2 P	3	1
UTS	1	-	-	7 F, 5P	6D, C	3 P	14	2
WSU (and College)	3	1 F, 3 P	5 P	10 F	6D, A	6 F	-	-
Deakin U	2	-	-	4 F, 2P	E	-	3	1
Federation U	2	-	-	4 F, 1 P	E	3 F, 1P	1	1
La Trobe U	2	-	-	2 F	-	-	2	1
Monash U	1	-	-	10 F	7D	5 P	5	-
RMIT U	1	8 F, 4 P	-	15 F	4D	10 F, 1 P	4	1
Swinburne U of Tech	2	6 P	-	10 F, 1 P	5D, C	6 F-	6	1
U of Melbourne	1	-	-	-	-	9 F,1 P	1	1
Victoria U	1	-	1 F	4 F, 1P-	-	-	3	-
CQU	7	4 F	3F	3 F	C, E, M-	3 F	-	2
Griffith U	2	-	-	7 F, 2P	6D	2 P-	7	2
James Cook U	2	-	-	5 F	2D	-	1	-
QUT	1	-	-	8 F	4D	7 P	2	1
U of Queensland	1	-	-	18 F	9D, 15M	4 F, 5P	9	1
USQ	2	4 F, 2P	6 F, 3 P	9 F	2D, E	13 F, 2P	1	2
U Sunshine Coast	2	-	-	2 F, 2P	1D	-	-	-
Curtin U	2	-	1 F	8 F, 1P	2D	11 P-	-	2
Edith Cowan U	1	-	1 F	12 F, 2 P	4D, I	7 F, 3 P-	1	-
Murdoch U	1	-	-	6 F	2D	-	1	-
UWA	1	-	-	-	-	6 F, 1 P	1	1
Flinders U	1	-	1 P	6 F, 1P	7D, 5M	2 F, 3P	6	1
U of Adelaide	1	-	-	30 F	5D	9 F-	7	-
UniSA	1	-	-5	8 F, 1 P	1D	4 P-	2	1
U Tasmania (inc. AMC)	2	-	-	7 F, 1P	1D, C, I	1F, 5 P	1	-
Charles Darwin U	1	-	1 F, 3 P	4 F	-	4 F	-	-
ANU	1	-	-	4 F	13D, A	3 P	2	-
Canberra U	1	-	-	1 F	-	-	2	-
UNSW (Canberra)	1	-	1 F (+A opt)	4 F, 1P	A	-	3	1
TOTALS	**-**	**18 F, 16 P**	**14 F, 13P**	**262 F, 29 P**	**-**	**95 F, 86 P**	**125**	**28**

Sources: EA accreditation data and status (F: Full Accreditation, P: Provisional Accreditation) from EA weblisting, Dec 2021.
Provisional accreditation applies to accredited programs that have yet to produce graduates.
Provider websites for MEngSci (may include programs eligible for accreditation) and M-mgt programs

BEng (Hons) Options Key:

A: advanced versions of the degree offered for selected students
C: co-op version available, some with additional Diploma
D: 'dual', 'double', 'combined', 'joint', or 'concurrent' degree options available in stated number of other fields (Arts, Science, etc.)
E: external study version available
I: selected degrees also provided with a second institution
M: Master degree extension/combination available, e.g. BEng(Hons),MEng (including in management)

TABLE 16 ACCREDITED BENG(HONS) AND MENG PROGRAMS OFFERED BY BRANCH OF ENGINEERING, ACED MEMBERS, DEC 2021

(A) Offered in Australia

ACED member	Civil, Surveying	Environmental, Water	Chemical, Process, Materials	Mining, Met, Petroleum	Electrical, Renew' Energy	Electronic, Comp Syst, Telecoms	Software	Biomedical, Medical	Mechanical, Auto, Manuf, Industrial	Aerospace	Mechatronics, Robotics	Naval Arch, Mar, Ocean
Charles Sturt U	1M											
Macquarie U						3B	1B		1B		1B	
Southern Cross U	2B[10]								1B			
UNSW (Sydney)	3B[15], 1M	1B, 1M	7B[16]	2B[16], 2M	3B[17], 2M	3B[33], 1M	2B[18]	1M	2B, 1M	1B	1B	
U of Newcastle	1B[19], 1M	1B, 1M	1B, 1M		2B[4], 1M[4]	1B[19], 1M	1B, 1M		1B[19], 1M	1B	1B[19], 1M	
U of Wollongong[26]	1B, 1M	1B, 1M	1B, 1M	1B, 1M	1B, 1M	2B, 2M		1B	1B, 2M		1B, 1M	
U of Sydney	1B, 3M		1B, 1M		1B, 2M	1M	1B, 1M	1B, 1M	1B, 2M	1B, 1M	1B	
UTS[3]	1B, 1M	1B			2B[4], 1M	1B, 1M	2B, 1M	1B, 1M	3B[24], 1M		1B, 1M	
Western Sydney U	2B, 1M	1M			1B, 1M	1M			1B, 1M		1B, 1M	
Deakin U	1B	1B			1B[4]		1B		1B		1B	
Fed U	1B, 1M			1B, 1M	1B[4],1M				1B, 1M		1B, 1M	
La Trobe U	1B								1B			
Monash U	1B, 1M	1B	2B, 2M		2B[6], 1M		1B		1B, 1M	1B	1B	
RMIT U	1B, 2M[31]	1B, 1M	1B, 1M		2B[4], 2M[4]	4B[29]		1B	3B[9], 3M	1B, 1M	1B[30], 1M	
Swinburne U of T	4B[25], 2M				1B[4], 1M[4]	1B, 1M	1B	1B	2B[11], 2M		1B	
U of Melbourne	3M[14]	1M	1M		1M		1M	1M	1M		1M	
Victoria U	2B[25]				2B[4]				1B			
CQU[3]	1B, 1M				1B, 1M				1B, 1M			
Griffith U	1B, 1M	1B, 1M			1B[4]	3B[2], 1M	1B		1B, 1M			
JCU	1B		1B		1B[4]	1B[27]			1B			
QUT	1B, 3M		1B		1B, 2M	1B		1B	1B, 2M	1B[8]	1B	
U of Queensland[20]	2B, 1M	1B, 1M	5B, 1M	2B, 1M	1B, 1M	1B	1B, 1M	1B, 1M	2B, 2M	1B	1B	
USQ[22]	1B, 4M[15]	1B, 1M			2B[4], 2M[4]	1B			2B, 2M[21]		2B	
U Sunshine Coast	1B				1B[4]				1B		1B	
Curtin U	1B, 1M		1B, 1M	3B, 3M	1B[4], 2M	1M	1M		2B, 1M		1B	1M
Edith Cowan U	1B, 1M	1B[5]	1B, 1M	1B, 1M	2B, 2M	2B, 2M			1B, 1M		2B, 2M	3B[1]
Murdoch U		1B	1B[28]		2B	2B[7]						
UWA	1M	1M	1M	1M	1M[4]		1M	1M	1M			
Flinders U	1B, 1M	1B	1M		1B[4], IM[4]		1B	1B, 1M	1B, 1M		1B	
U of Adelaide	6B[12], 2M	1B	4B, 1M	10B[12], 1M	1B[4],1M	2B[12], 1M	1B		4B, 1M	1M	1B,1M	
UniSA	4B, 2M	1M			1B[4], 1M	1M			2B		2B	
UTas (inc. AMC)	1B, 1M[23]				2B[4], 1M	1B, 1M			1B, 1M			3B, 1M
CDU	1B, 1M		1B, 1M		1B[4],1M[4]				1B, 1M			
ANU					1B, 1M	1B, 1M	1B		1B		1B, 1M	
Canberra U						1B[13]						
UNSW (Canberra)	1B				1B				1B	1B		1B
TOTALS	46B, 37M	14B, 11M	19B, 14M	20B, 11M	40B, 31M	31B, 15M	15B, 7M	8B, 7M	43B, 31M	8B, 3M	23B, 11M	7B, 2M

Source: Engineers Australia Accredited Program weblisting, Dec 2021
https://www.engineersaustralia.org.au/sites/default/files/2021-12/Web%20List%20-%20V46%20-%20211223.pdf

Notes:

1. Joint with UTas (AMC)
2. Includes named "Electronic and Energy" and "Electronic and UAV"
3. Also offered in co-op mode with an additional Diploma
4. Includes at least one named: "Electrical & Electronic' or "Electrical and Information"

5. With Civil Engineering
6. Named “Electrical & Computer Systems” and “Resources and Renewable Energy”
7. Named “Industrial Computer Systems” and “Instrumentation & Control”
8. Named “Electrical & Aerospace”
9. Includes named “Sustainable Systems” and “Automotive’
10. One named “Coastal Engineering”
11. One named “Product Engineering”
12. Combinations: “Civil &Structural”, “Civil &Environmental”, Electrical & Sustainable Energy”, “Mechanical & Aerospace”, “Petroleum and Chemical”, etc.
13. Named “Network & Software Engineering”
14. Includes “Architectural” and “Spatial”
15. Includes “Surveying” and “Civil with Architecture”
16. Includes: “Industrial Chemistry”, BEng in Materials Science and Engineering with named majors in Ceramic Engineering, Materials Engineering, Physical Metallurgy and Process Metallurgy
17. Includes “Photovoltaics & Solar Energy” and “Renewable Energy”
18. Includes “Bioinformatics”
19. Plus degree combinations: “Civil with Environmental”, “Elec & Electronics with Computer Systems”, “Mechanical with Mechatronics” and “Mechatronics with Elec & Electronics”
20. Disciplines may be taken in several combinations, and as BEng/MEng dual degrees
21. Includes “Agricultural Engineering”
22. Most Masters degrees are offered as MEng.Sci and MEngPrac – only one recorded per branch
23. Includes “Timber Design”-
24. Includes an unspecified specialised degree
25. Incudes “Architectural Engineering”
26. BEng(Hons) degrees also offered in several dual major combinations.
27. Named “Electronic Systems and Internet of Things”
28. Named “Chemical and Metallurgical”
29. Includes one named “Electronic Product Design”
30. Named “Advanced Manufacturing and Mechatronics”
31. Includes one named “Transport Systems”
32. Includes “Construction”
33. Includes “Quantum Engineering”

(B) Offered Offshore (EA weblist Dec 2021)

ACED member	Civil, Construction	Environmental	Chemical	Petroleum	Electrical	Electronic, Comp Syst, Telecoms	Software	Mechanical,	Mechatronics, Robotics
U of Newcastle									
in Singapore	1B				1B	1B			1B
U of Wollongong									
in Dubai	1B				1B	2B		1B	
Monash									
in Malaysia	1B		1B			1B[34]	1B	1B	1B
RMIT									
in Hong Kong	1B				1B			1B	
in Vietnam					1B[4]		1B		1B
Swinburne									
in Sarawak, Malaysia	1B				1B[4]			1B	1B
Curtin									
in Sarawak, Malaysia	1B	1B	1B	1B	1B[4]			1B	
in Sri Lanka	1B				1B[4]			1B	

34. Named: “Electrical and Computer Systems”

TABLE 17 SUBFIELDS IN ASCED FIELDS OF EDUCATION 03 ENGINEERING AND RELATED TECHNOLOGIES and 02 INFORMATION TECHNOLOGY

03 ENGINEERING AND RELATED TECHNOLOGIES

0301	**MANUFACTURING ENGINEERING AND TECHNOL'Y**
030101	Manufacturing Engineering
030103	Printing
030105	Textile Making
030107	Garment Making
030109	Footwear Making
030111	Wood Machining and Turning
030113	Cabinet Making
030115	Furniture Upholstery and Renovation
030117	Furniture Polishing
030199	Manufacturing Engineering and Technology, n.e.c.
0303	**PROCESS AND RESOURCES ENGINEERING**
030301	Chemical Engineering
030303	Mining Engineering
030305	Materials Engineering
030307	Food Processing Technology
030399	Process and Resources Engineering, n.e.c.
0305	**AUTOMOTIVE ENGINEERING AND TECHNOLOGY**
030501	Automotive Engineering
030503	Vehicle Mechanics
030505	Automotive Electrics and Electronics
030507	Automotive Vehicle Refinishing
030509	Automotive Body Construction
030511	Panel Beating
030513	Upholstery and Vehicle Trimming
030515	Automotive Vehicle Operations
030599	Automotive Engineering and Technology, n.e.c.
0307	**INDUSTRIAL ENGINEERING AND TECHNOLOGY**
030701	Mechanical Engineering
030703	Industrial Engineering
030705	Toolmaking
030707	Metal Fitting, Turning and Machining
030709	Sheetmetal Working
030711	Boilermaking and Welding
030713	Metal Casting and Patternmaking
030715	Precision Metalworking
030717	Plant and Machine Operations
030799	Mechanical and Industrial Eng'g and Tech'y, n.e.c.

0309	**CIVIL ENGINEERING**
030901	Construction Engineering
030903	Structural Engineering
030905	Building Services Engineering
030907	Water and Sanitary Engineering
030909	Transport Engineering
030911	Geotechnical Engineering
030913	Ocean Engineering
030999	Civil Engineering, n.e.c.
0311	**GEOMATIC ENGINEERING**
031101	Surveying
031103	Mapping Science
031199	Geomatic Engineering, n.e.c.
0313	**ELECTRICAL & ELECTRONIC ENG'G AND TECHNOL'Y**
031301	Electrical Engineering
031303	Electronic Engineering
031305	Computer Engineering
031307	Communications Technologies
031309	Communications Equip't Installation & Mainten'ce
031311	Powerline Installation and Maintenance
031313	Electrical Fitting, Electrical Mechanics
031315	Refrigeration and Air Conditioning Mechanics
0315	**AEROSPACE ENGINEERING AND TECHNOLOGY**
031501	Aerospace Engineering
031503	Aircraft Maintenance Engineering
031505	Aircraft Operation
031507	Air Traffic Control
031599	Aerospace Engineering and Technology, n.e.c.
0317	**MARITIME ENGINEERING AND TECHNOLOGY**
031701	Maritime Engineering
031703	Marine Construction
031705	Marine Craft Operation
031799	Maritime Engineering and Technology, n.e.c.
0399	**OTHER ENGINEERING AND RELATED TECHNOLOGIES**
039901	Environmental Engineering
039903	Biomedical Engineering
039905	Fire Technology
039907	Rail Operations
039909	Cleaning
039999	Engineering and Related Technologies, n.e.c.

02 INFORMATION TECHNOLOGY

0201	**COMPUTER SCIENCE**
020101	Formal Language Theory
020103	Programming
020105	Computational Theory
020107	Compiler Construction
020109	Algorithms
020111	Data Structures
020113	Networks and Communications
020115	Computer Graphics
020117	Operating Systems
020119	Artificial Intelligence
020199	Computer Science, n.e.c.

0203	**INFORMATION SYSTEMS**
020301	Conceptual Modelling
020303	Database Management
020305	Systems Analysis and Design
020307	Decision Support Systems
020399	Information Systems, n.e.c.
0299	**OTHER INFORMATION TECHNOLOGY**
029901	Security Science
029999	Information Technology, n.e.c

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