



## ANNUAL REPORT 2019

### **About us**

The Australian Council of Engineering Deans (ACED) has formally been in operation for more than 20 years, with the stated mission *“To create economic and social impact by advancing engineering education, research and scholarship on behalf of Australian universities.”*

ACED does this in the national and international interest, which for education and research includes assuring the public that engineering graduates will conduct their work in the public interest with due regard for human safety and the sustainability of the environment.

ACED is an incorporated association whose members are the Australian public universities that provide undergraduate and postgraduate degree programs and research in engineering.

The Council elects a President for a two-year period. The President is supported by the Executive Committee, whose members are elected by the Council.

The Council meets in full twice a year (Autumn and Spring).

ACED has strong links with the Australasian Association of Engineering Education (AaeE) whose members are primarily engineering academics in Australian and New Zealand universities. ACED sponsors the annual AaeE award for Excellence in Teaching.

ACED invites a representative of the New Zealand Council of Engineering Deans to attend Council meetings. ACED supports and encourages members to become members of the Global Engineering Deans Council (GEDC)

ACED also has strong links with Engineers Australia (EA). Representatives of the EA Accreditation Centre attend all ACED meetings to inform and discuss with members developments in the national engineering program accreditation system, and matters of importance arising within the International Engineering Association (IEA) that has oversight of the international engineering education Accords of which EA is a member.

### **ACED Governance**

#### **Executive Committee (at Dec 2019)**

|                    |  |
|--------------------|--|
| President:         | Professor Ian Burnett  |
| Deputy President:  | Professor Elizabeth Croft (interim)  |
| Past President:    | Professor John Wilson  |
| Members:           | Professor Friso de Boer<br>Professor Elizabeth Croft<br>Professor Elisa Martinez-Marroquin<br>Ms Julia Lamborn (representing the ADTL Group)<br>Professor Andrew Bradley (representing the ADR Group)<br>Professor Scott Smith (representing ADI Group)<br>Dr Mark Symes (representing the AaeE) |
| Executive Officer: | Em Professor Doug Hargreaves AM  |

Consultant: Em Prof Robin King

### **ACED Objectives:**

- **Promotion:** To provide a forum for Australian leaders of engineering education to discuss matters of mutual concern and national importance, thereby contributing to matters such as raising general community awareness on the need for and value of high-quality engineering education, research training in the higher education sector.
- **Engagement:** To further the interests of engineering education and research in the higher education through engagement and outreach with relevant national and international bodies, particularly EA, AaeE and NZCED
- **Policy:** To develop positions and make statements on relevant issues in response to government inquiries and concerns of professional and industry bodies, and to the media and the general community
- **Projects:** To initiate and conduct reviews and projects consistent with its mission. This would include monitoring the state of engineering education and scholarship, benchmarking programs and resources and the quality of outcomes
- **Leadership:** To support the development of leaders of engineering education and research within the faculties and schools.

### **ACED Meetings 2019**

#### **The Council met in Adelaide (March) and Melbourne (Nov), with guest speakers**

- Ms Renee Hindmarsh (Office of the Training Advocate, South Australian Training Advocate)
- Prof Caroline McMillen, South Australian Chief Scientist

### **ACED Project “Engineering 2035”**

ACED initiated a major project during 2019 to investigate what knowledge skills and attributes will be required by graduate engineers in the 2035, and how the education system should be developed accordingly.

The Stage 1 report “Engineering Futures 2035, a scoping study” and a two-page Summary are available on the ACED website.

A forum with representatives from industry, government and academia was held in Canberra on 29 August 2019 to discuss the Stage1 findings and recommendations for further work. The keynote speaker was:

- Hon Karen Andrews MP, Minister for Science, Industry and Technology and invited speakers:
- Em Prof Peter Lee (Chair, Engineering 2035 Project Steering Committee)
- Prof Kourosh Kayvani (Managing Director, Design, Innovation and Eminence, Aurecon)
- Mr Jeff Connolly (Chair and CEO, Siemens in the Pacific Region)

- Mr Jacques Joubert (Consultant, KPMG Engineering and Asset Management Advisory Service)
- Em Prof Doreen Thomas (Director, ATSE)
- Dr Nick Fleming (Director, Engineers Australia)
- Em Prof Elizabeth Taylor AO (Chair, Washington Accord)
- Prof Ian Burnett (ACED President)
- Prof Caroline Crosthwaite (Engineering 2035 Project Leader)
- Prof Mark Hoffman (Dean of Engineering UNSW)
- Prof Elanor Huntington (Dean of Engineering, ANU)

## **ACED Representation on other bodies**

ACED participates in the reference group for the *Design and Technology* school curriculum implementation, convened by the Australian Curriculum, Assessment and Reporting Authority (ACARA). Together with *Digital Technologies*, this curriculum forms the compulsory *Technologies* learning area for school years F–10. *Design and Technology* introduces and develops engineering concepts and practice.

ACED was represented on the Steering Committee for the *Australian Engineering Taskforce* project initiated by three ACED members, Professor Elizabeth Croft, Professor Mark Hoffman and Professor Elanor Huntington. The object of the project is to increase the participation of school students STEM and especially engineering.

The President and Executive Officer ACED represent ACED on the *Tripartite Committee*, together with representatives of the Academy of Technology and Engineering (ATSE) and Engineers Australia (EA). The Committee met on 18 June 2019. Topics discussed included ACED's *Engineer 2035 Project*, the national *Decadal Plan for Women in STEM*, increasing diversity in the STEM workforce, micro-credentials for practicing engineers, and attracting female school students to STEM.

## **Publications and presentations at national and international conferences**

Crosthwaite C, Lee P, King R, Hargreaves D, Foley B, Goldfinch T, Lamborn J, Symes M and Wilson J, "Preparing the next generation of engineers: what will an engineering graduate of 2035 look like?" AaeE Annual conference, Brisbane, Dec 2019.

Male S A, King R W, "Enhancing Learning Outcomes from Industry Engagement in Australian Engineering Education". *Journal of Teaching and Learning for Graduate Employability*, Volume 10 (1) PDF 101-117. <https://ojs.deakin.edu.au/index.php/jtlge/article/download/792/805>.

Lee, P and Crosthwaite C, Foley B, Goldfinch T, Hargreaves D, King R, Symes M, Wilson J "What will an Engineering Graduate of 2035 Look Like?" World Engineers Convention, Melbourne, Nov 2019.

Hargreaves D, "The demise of conventional engineering disciplines". Griffith University Symposium on the Future of Engineering Education, Brisbane, Dec 2019.

Crosthwaite C and Hargreaves D, "The ACED engineering education for 2035 project; background, Stage 1 report and recommendations". International Engineering Alliance (IEA) and World Federation of Engineering Organisations (WFEO) joint Working Group on Graduate attributes and professional Competencies, Melbourne, Nov 2019.

## ACED submissions to national reviews

ACED responds to requests to make submissions to the Australian Government's consultation processes on matters that relate to engineering education and research. These responses are normally then published on the ACED website.

During 2019, ACED made submissions to:

- the Review of the Australian Qualifications Framework
- the Review of the ANZ Standard Research Classification

## ACED Financial Report (from Auditor's report)

|                                       |            |
|---------------------------------------|------------|
| Opening Balance (1 Jan 2019)          | \$ 187,131 |
| Income (members' dues + interest)     | \$ 175,587 |
| Total Expenditure                     | \$ 158,104 |
| Retained surplus (31 Dec 2019)        | \$ 204,614 |
| <br>                                  |            |
| Total Current Assets (all 4 accounts) | \$ 211,079 |
| Total Current Liabilities             | \$ 6,465   |
| Nett Assets                           | \$ 204,614 |

## ACED Statistics

During early 2019, ACED compiled and published on the website, the *Australian Engineering Education Student and Staff Statistics*, up to calendar year 2017. These data are obtained from the publications and websites of the Australian Higher Education Statistics Unit, plus additional purchased material. Data on commencing enrolments, graduations, staffing, graduate outcomes and employer satisfaction are included.

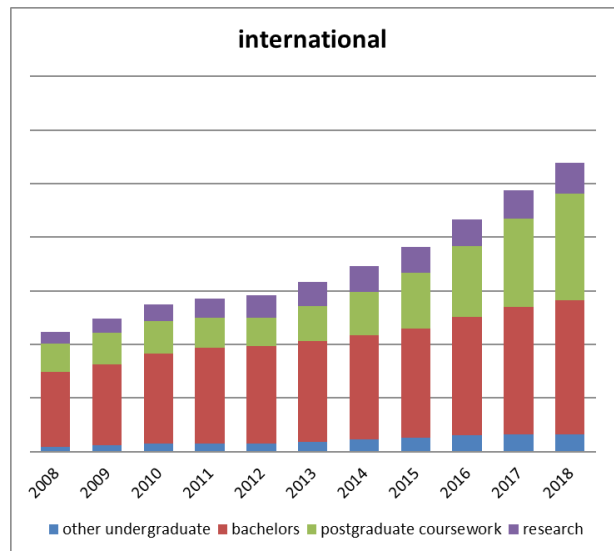
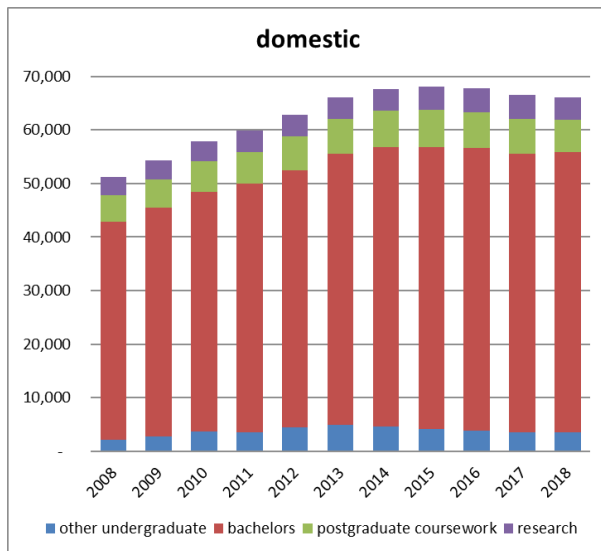
These statistics and other data were summarised in two factsheets (see website), *Australian Engineering Education: Coursework Degrees* and *Research and Research Training in Engineering* (both May 2019).

## Student enrolments and graduations, 2008 – 2018

In late 2019, the national data for 2018 became available. These will be compiled in a statistics report in early 2020.

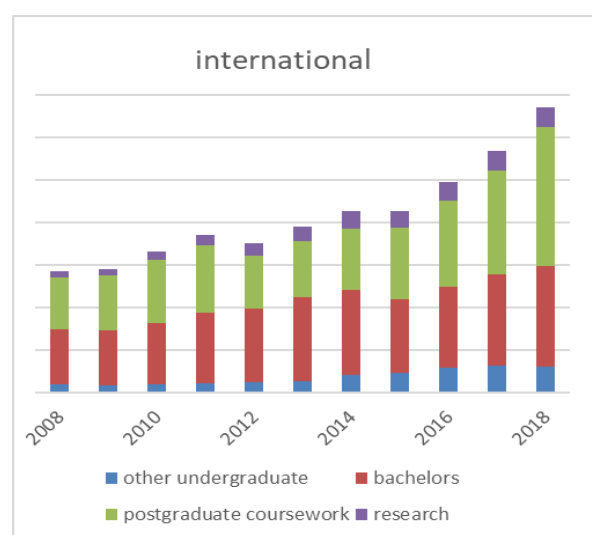
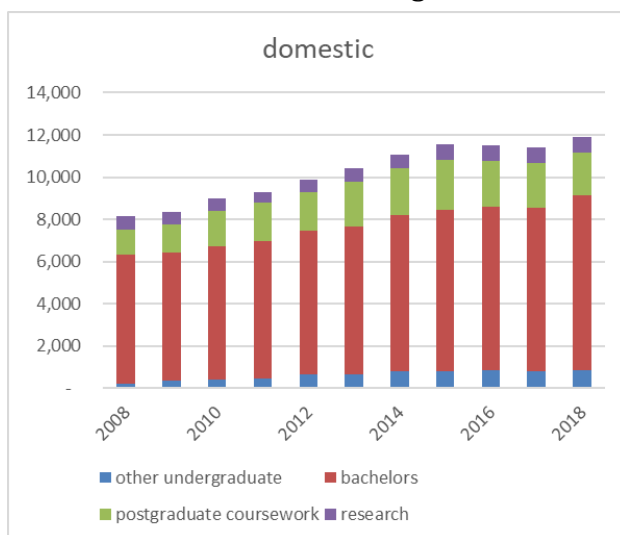
In summary, in 2018 there were more than 119,000 students enrolled in higher education qualifications in engineering and related technologies, 97% at ACED member institutions.

Over the decade, total domestic enrolments have plateaued while international enrolments have increased significantly, as is evident in the following charts:



### Total Enrolments in Engineering & Related Technologies

Graduations in engineering exceeded 25,000 in 2018. International graduates constituted 53% of the total graduating cohort, due principally to the strong growth in postgraduate coursework degrees. Women constituted 14.9% of all domestic graduates and 21.6% of the international graduates.



### Graduations in Engineering and Related Technologies

Commencing enrolments in 2018 increased on 2017 figures for both domestic and international student cohorts. The proportion of women in the domestic bachelor degree commencing cohort increased to 18.1%, the highest figure ever.

### Contact us

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