January 2017 - Starter Kit
UNSW Brand Refresh

Overview
From the week of 16 January 2017, the University's brand will be refreshed. New elements will be introduced to enhance the brand and increase design flexibility, whilst retaining the brand equity of elements such as the University crest and the yellow brand colour.

Our brand guidelines will be updated to support this change to the University's branding. The full suite of updated branding templates and guidelines will be updated during 2017 and will be made available via myUNSW.

In the interim, please use this Starter Kit as a guide to the brand update. This document is confidential to UNSW staff.

What's changed?
• University name
  The University's name will change from 'UNSW Australia' to 'UNSW Sydney' and 'UNSW Canberra'. The name change reinforces the University's city locations in iconic Sydney and our national capital, Canberra. The first mention of the University in communication must be 'UNSW Sydney'. Subsequent mentions must be 'UNSW'. If necessary to ensure recognition, the first mention in formal communications may be 'UNSW Sydney (The University of New South Wales). Subsequent mentions must be 'UNSW'.

• Logo
  The University logo has been updated to reflect the brand refresh. The University logo is composed of a refined University crest, 'UNSW' type and 'Sydney' location. The portrait version of this logo is the preferred usage.

• Sub-logos
  A UNSW Canberra specific logo; composed of the refined University crest, 'UNSW' type and 'Canberra' location is also being introduced. The portrait version of this logo is the preferred usage.
  The UNSW Business School logo has been updated, removing the 'Australia' location to reflect the University brand refresh. The landscape version of this logo is the current preferred usage.
  The UNSW Global logo has also been updated to incorporate the refined University crest and removal of the 'Australia' location below the crest.
  No other versions of the University logo, other than those noted above should be used.

A snapshot of achievements and events at UNSW Mining Engineering
Highlights of 2016

A number of important milestones were reached and achievements attained during 2016 by students and staff in the School of Mining Engineering at UNSW.

The year saw a number of records being broken. The first was a record 157 students who graduated during the year with 67 students who received an undergraduate degree in mining engineering and 89 students a postgraduate qualification. As shown in Table 1, this brought the total number of graduates since establishment of the School in 1948 to 2546 of which 1496 (or 59%) are graduate mining engineers with 15% being female graduate engineers. A further 232 students completed the Mine Ventilation Officers program. There were 77 students in the final year of the undergraduate program in 2016, which was by far the largest cohort within the four universities that comprise Mining Education Australia (MEA).

Table 1. The total number of undergraduate and postgraduate qualifications awarded during the period 1948-2016.

<table>
<thead>
<tr>
<th>Undergraduate</th>
<th>Postgraduate</th>
<th>Total</th>
<th>Ventilation Officers</th>
</tr>
</thead>
<tbody>
<tr>
<td>coursework</td>
<td>coursework</td>
<td>research</td>
<td>Awarded</td>
</tr>
<tr>
<td>1496 (59%)</td>
<td>937 (37%)</td>
<td>113 (4%)</td>
<td>2546</td>
</tr>
</tbody>
</table>

The record number of final year students however also coincided with the smallest first year intake in over four decades with 12 students enrolling in the undergraduate program. Not since 1973 has the intake been at a comparable level being even lower than the intakes seen during the late 1990s when the Minerals Council of Australia (MCA) commissioned the “Back from the Brink” report that led to establishment of the MEA program.

Improvements to courses in recent years including more offerings of distance-based postgraduate courses were a contributing factor in the overall improvement in student satisfaction rating reaching 90.3%.

Research performance has continued to benefit from the increase in staffing levels in recent years and the strategy for greater focus on research activities. New grant income increased by 40% in 2016 to $1.89M with an equivalent annual grant income of $126k per academic. Since 2012 there has been a 159% increase in output of journal articles with 57 papers published in 2016 and a 75% increase in total publications to 96 papers including two books.

The emphasis on people and engagement continued. One important benefit to students stemmed from the newly established Industry Experience Help Program (IEHP) resulting in an additional 43 students gaining industry experience during the 2015/16 summer recess following consultation in forums and engagement with industry partners. This was especially important as there was a record number of students seeking industry training in a tight labour market.

To enhance understanding of the important role that mining makes in people’s everyday life, the School’s in-house virtual reality (VR) capabilities were used to develop the Mineral Awareness VR Experience. This project made use of readily available VR technology built into smartphones to take students on a journey to mine sites around Australia in search of the mineral elements that go into the making of a mobile phone. The popularity of this with high school students has been overwhelming and discussions are underway for further developments.

Another highlight was the awards given to two alumni in recognition of their contributions to the industry.

Overall, UNSW Mining Engineering has continued to build on the significant achievements in recent years. In the coming year, it is looking to make further gains in the areas of teaching and research through its links with strategic partners locally and internationally within industry, government, and other research and educational institutions.
UNIVERSITY RANKINGS

In the inaugural category of Mineral and Mining Engineering, UNSW Mining Engineering was ranked in 16th position in the 2016 QS World University Rankings. When considering only universities having the highest of 5-Star Plus rating, UNSW Mining Engineering was ranked in 6th position globally and 1st position in Australia. This is an achievement equal with Civil and Environmental Engineering together being the two highest ranking engineering Schools at UNSW.

Overall, the UNSW Engineering Faculty was ranked in 21st position and the university ranking improved to 49th position.

STUDENTS AND STAFF

Student intake

A milestone was achieved in 2013 with the record set for the largest student intake into the undergraduate and postgraduate mining programs at UNSW. This marked the end of an 11-year period of growth in student intake that began in 2003 coinciding with the last mining cycle. As has been the case in the past, the outward manifestations of the upturn in the mining cycle had a positive impact on general public perceptions resulting in a steadily increasing student intake each year during this period into the mining programs.

As shown in Figure 1, student intake into the first year of the mining program grew from 16 students in 2002 to eventually reach 107 students in 2013 with a further 22 students enrolled in combined degree programs including arts, science and commerce with the result that the total undergraduate mining intake in 2013 was 129 students.

Interestingly, of the 1496 UNSW graduate mining engineers, a disproportionate number of around 37% did so in this 11-year period since 2003 of the last mining cycle.

Since the peak intake in 2013 following the cooling in mineral commodity prices and slowdown in mining capital investment, student intake has fallen sharply in each successive year to the point that the total undergraduate intake in 2016 was 12 students of which 6 students were enrolled in the single degree mining engineering program and 6 students enrolled in a combined degree program.

Student taught load and headcount

A measure of total student enrolment is Equivalent Full-Time Student Load (EFTSL). This is important as budget allocations are largely based on EFTSL. It is a weighted measure accounting for actual student taught load which in the case of the undergraduate mining program is heavily skewed to the final two years of the program when the majority of the mining courses are delivered.

Consequently, there is a three-year lag from any change in student intake on EFTSL. For postgraduate courses, any change in student intake has an immediate effect in the following year on EFTSL.

During the period since the peak intake in 2013 while the decline in student intake has been rapid, the effect on total student enrolment has been ameliorated somewhat.

Figure 1. Variation in first year student intake into the undergraduate mining program and the number of graduate mining engineers from UNSW since 1948.
by the earlier large intakes with a steadier decline as shown in Figure 2. The EFTSL of postgraduate coursework students has fallen by nearly two-thirds during the same period.

Overall, total EFTSL has fallen by 27% since 2013 to 257 students in 2016 of which 18% were female students as shown in Table 2. The reduction has not been even across the coursework programs with cumulative falls since 2013 of 67% in the postgraduate programs and 9% in the undergraduate program. But this situation will significantly worsen in 2018 onwards as the more recent low student intakes will significantly reduce EFTSL.

Conversely during this same period there has been a 27% increase in higher degree research (HDR) students, mainly PhD students, albeit off a smaller base. This reflects the increase in research intensity within the School.

Table 2. Total EFTSL enrolment in the mining programs during the period 2011-16.

On the other hand, the headcount of all undergraduate mining students enrolled in single and combined degree programs has fallen by 41% to 198 students in 2016 as shown in Table 3.

Table 3. Total student headcount in the undergraduate and postgraduate coursework programs.

The reduction in the number of undergraduate students has accelerated with each year since 2013 reaching an annual rate of decline in 2016 of 21.4% as shown in Figure 3.

During the same period since 2013, the total cohort of postgraduate students has fallen by 62% to 104 students.

Overall, the total cohort of mining coursework students (undergraduate and postgraduate) has halved from 612 students in 2013 to 302 in 2016.

Student enrolment cycles
An analysis of the student intakes since 1972 has identified six distinct cycles in student intake with an average period of 8.4 years as shown in Table 4.

Considering these six cycles, the downturn in student enrolment is often quite rapid with an average period in the downturn phase of the cycle of 3.2 years. The upturn phase tends to be much slower at nearly double this
timeframe of 5.2 years. The average period of the different phases in the student intake cycle is shown in Figure 4.

Table 4. Analysis of the student intake cycles at UNSW.

<table>
<thead>
<tr>
<th>Years of Highest Enrolment</th>
<th>Count of years</th>
<th>Cycle Period Peak-to-Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>2</td>
<td>3.2</td>
</tr>
<tr>
<td>1982</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>1992</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>2008</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2013</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Staff

The overall staffing level in the School has increased in recent years as shown in Table 5. This has largely been as a result in the growth in EFTSL with increases in the number of general academic (teaching and research), research, and administrative and support staff. This increase has provided more time for research activities including preparing grant applications, research project management, student supervision and publications. This has underwritten the improvements in research outcomes that has been evident in recent years.

At the same time, there has been an increasing emphasis in the recruitment of junior staff particularly at the level of post-doctoral research fellow that will contribute to the supply of younger academic staff as well assist in the supervision of an increasing number of HDR students.

The following changes in staffing occurred during 2016:

Recruitment
- **Dr Michael Hitch**: Associate Professor, Director Australian Centre for Sustainable Mining Practices (ACSMP)
- **Dr Hamed Lamei Ramandi**: Post-doctoral Research Fellow
- **Maria Schwensen**: School Manager
- **Christine Xiouri**: Administrative Assistant

Promotions
- **Dr Hossein Masoumi**: Lecturer

Other Appointments – Adjunct
- **Adjunct Professor Dan Payne**: Current substantive position: Manager, Geotechnical Services for the BHP Billiton Mitsubishi Alliance
- **Adjunct Professor Shuren Wang**: Current substantive positions: Henan Polytechnic University, China - Director Opening Laboratory for Deep Mine Construction; Deputy Director Henan Key Laboratory for Green and Efficient Mining & Comprehensive Utilization of Mineral Resources; Director International Joint Laboratory of Henan Province for Underground Engineering Excavation and Environmental Effects.

Departures
- **Dr Rudra Mitra**: Senior Lecturer
- **Dr Farshad Rashidi-Nejad**: Senior Lecturer
- **Corinne Payne**: School Manager

TEACHING

Graduating students

The total number of students that graduated with a mining qualification in 2016 was 157 of which 67 students were awarded an undergraduate degree and 90 students were awarded a postgraduate qualification. The breakdown by degree is shown in Table 6.

The year was marked by a record number of 77 students who completed the undergraduate program. This includes both confirmed and potential graduands.
Confirmed graduands have met all the program requirements for graduation while potential graduands have completed the coursework requirements but have not yet completed 60 days of Industrial Training.

As at end March 2017, 62 of the 77 final year students were confirmed graduands of which 67% of students will graduate with the single degree BE Mining Engineering. Of the remaining students, 19% completed the requirements for the double degree in Civil/Mining, 7% in Mining/Commerce and 6% in Mining/Science.

Of the confirmed graduands, 26 (or 59%) had secured graduate employment as at 9 December 2016. Interestingly over two-thirds of graduates were placed with companies in the mining equipment, technology and services (METS) sector, reflecting its growing importance in the economy. A further 10 potential graduands had gained employment in Industrial Training. The number of graduate mining engineers has risen steadily from 13 in 2006 when the Mining Education Program (MEA) program was introduced.

Cementing its place as the leading educator of mining engineers in Australia with the largest number of students in the mining program, UNSW will potentially produce approximately 38% of the estimated 197 MEA mining graduates in 2016 as shown in Figure 5.

The decline in student intake has been similar across all four MEA universities. The effect of the decline on the class enrolments levels in each of the four years of the undergraduate program during 2016 is shown in Figure 6. The graph illustrates the chasm between the total of 233 students enrolled in Year 4 courses across MEA and the 44 students enrolled in Year 1 courses. This decline will impact on the supply pipeline of mining engineering graduates that are expected to graduate between now and 2019.

Teaching quality

A total of 24 undergraduate and 38 postgraduate courses were delivered during 2016.

The postgraduate courses are across a number of programs in mining engineering and mine management ranging from the Graduate Certificate program through to the Graduate Diploma and Masters coursework program. In addition, there were courses offered in the specialist programs in mine geomechanics and coal mine strata control.

Due to low enrolment levels in 2014 and in 2015, delivery of the mine ventilation program was suspended for one
year in 2016 with the intention of resuming in 2017 and every second year if there is sufficient interest. With low enrolments also in the geomechanics and strata control programs, consideration is being given to a similar pattern of offerings in future years.

Recent development and rollout of changes to courses has resulted in a near equal split in the mode of delivery between one-week face-to-face short courses and distance-based delivery.

Across the board in undergraduate and postgraduate courses, the quality of teaching during 2016 improved with the level of student satisfaction reaching 90.3% as shown in Figure 8 of which 16 or 64% of courses achieved a satisfaction rating of 90% or better. Of the top ten courses having the highest level of student satisfaction, nine courses were in the postgraduate programs as listed in Figure 9.

In terms of class sizes, the majority of postgraduate courses had class sizes of fewer than 20 students whereas 66% of undergraduate courses had a class size of 50 or more students as shown in Table 7.

<table>
<thead>
<tr>
<th>Class size</th>
<th>Undergraduate</th>
<th>Postgraduate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>2</td>
<td>9</td>
<td>11</td>
</tr>
<tr>
<td>21-50</td>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>&gt;50</td>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>total</td>
<td>12</td>
<td>13</td>
<td>25</td>
</tr>
</tbody>
</table>

**Industry experience help program (IEHP)**

In 2015/16, the School launched a new program to assist students gain placement over the 2015/16 summer recess in the industry that is a requirement of the undergraduate program. Dr James Tibbett was appointed Program Manager coordinating the placement offers from industry and matching against the student applications. The purpose of the program was to maximise the number of placements and minimise the transactional issues for industry partners.

The program successfully placed 43 students in 20 organisations as shown in Figure 10 which was on top of the other organised placements in industry. Due to the success of the program it was repeated again during the 2016/17 summer recess.

**Student mine site visits**

The quality of teaching and experience gained by our students is greatly enhanced by field trips to mine sites. This puts into context much of the theory and concepts introduced in the classroom.

The School organises three annual field trips for students including: a Mining Summer School for senior high school students (see details in later section); a 1st Year Field trip to mines in and around the Sydney Basin and NSW Central West region; and, a 2nd Year Field Trip to the Broken Hill region. Site visits are also a key element of courses including mine ventilation and the Coal Mine Strata Control program.
Thank you to the following mines for their valued support in hosting the student visits to their mine sites:

- Airly Mine, Centennial Coal
- Broken Hill Operations, Perilya Ltd
- Cadia Valley Operations, Newcrest Mining Limited
- East Goyung, Hanson Australia
- Gingko Mine, Cristal Mining Australia
- Mawsons Blue Metal Quarry
- Metropolitan Colliery, Peabody Energy
- Moolarben Coal Complex, Yancoal Australia Limited
- Mungari Operations, Evolution Mining
- Myuna Colliery, Centennial Coal
- Northparkes Mine, CMOC (China Molybdenum Co. Ltd)
- Springvale Colliery, Centennial Coal
- Ulan Coal, Glencore Australia Pty Ltd

**RESEARCH**

**Research income**

With a particular focus on improving the sustainability of the Australian coal mining industry, academic staff have increased the number of grant applications spanning ground control in mining, environmental and dust management, risk management and mineral processing. There was a near 40% increase in successful grant applications in 2016 with funding provided for nine projects to a total value of $1.72M as listed in Table 8. A further $165k of research income was generated from other sources. This represents an effective total research grant income in 2016 of $1.89M or $126k per FTE staff.

The increase in research funding reflects the greater level of industry engagement by academic staff in understanding the broad spectrum of issues currently facing industry. Many of the projects involve collaboration with different disciplines and specialisations in UNSW Engineering and across UNSW as well as with other local and international universities and research institutions such as the CSIRO. The School has over 50 national and international partners that are as diverse as NASA where there is a research partnership in off-earth mining.

**Research publications**

Communicating the outcomes of research continued with a greater focus on publishing papers in high quality journals as shown in Table 9.

### Table 9. Number of journal articles and conference papers.

<table>
<thead>
<tr>
<th>Year</th>
<th>Journal papers</th>
<th>Conference papers</th>
<th>Books</th>
<th>Book chapters</th>
<th>Other publications</th>
<th>Total publications</th>
<th>Annual change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>2</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>18</td>
<td>-</td>
</tr>
<tr>
<td>2012</td>
<td>22</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>55</td>
<td>36%</td>
</tr>
<tr>
<td>2013</td>
<td>30</td>
<td>28</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>59</td>
<td>17%</td>
</tr>
<tr>
<td>2014</td>
<td>35</td>
<td>33</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>68</td>
<td>43%</td>
</tr>
<tr>
<td>2015</td>
<td>50</td>
<td>45</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>96</td>
<td>43%</td>
</tr>
<tr>
<td>2016</td>
<td>57</td>
<td>34</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>96</td>
<td>14%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>proportion journal papers</th>
<th>11%</th>
<th>40%</th>
<th>51%</th>
<th>51%</th>
<th>52%</th>
<th>59%</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTE staff</td>
<td>10</td>
<td>13</td>
<td>15</td>
<td>17</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>total papers per FTE</td>
<td>1.8</td>
<td>4.2</td>
<td>3.9</td>
<td>4.5</td>
<td>5.6</td>
<td>6.4</td>
</tr>
<tr>
<td>journal papers per FTE</td>
<td>0.2</td>
<td>1.7</td>
<td>2.0</td>
<td>2.3</td>
<td>2.9</td>
<td>3.8</td>
</tr>
</tbody>
</table>

From 2011 there has been a continual increase in publication output with a significant step change...
occurring in 2012 coinciding with an increase in staffing. Between 2012 and 2016 there was a 75% increase in total publication output and a 159% increase in output of journal articles, the latter representing 59% of all publications. The output per staff member has increased and now stands at 3.8 journal papers and 6.4 total papers per FTE staff.

Book publications
Two books authored by academics in the School were published during 2016.

The first book, Ground Engineering: Principles and Practices for Underground Coal Mining was written by Emeritus Professor Jim Galvin. The book launch was held in April at a function jointly hosted by the School and Springer Publishing. This event was opened by Emeritus Professor Mark Wainwright and Master of Ceremonies Professor Mary O’Kane, NSW Chief Scientist and Engineer, and brought together a significant section of the mining industry and academia.

The book was officially launched by Tony Egan, Vice Chairman of ACARP, who described the text as important and influential and one which would make a vast difference to the industry.

The textbook consolidates 50 years of knowledge and experience in mining and geotechnical engineering and mine management and presents it in a risk management framework as a basis for improving safety, innovation and economics in mining, especially in the underground coal sector.

Figure 13. Ground Engineering: Principles and Practices for Underground Coal Mining by Emeritus Professor Jim Galvin (left) and Advances in Rock-Support and Geotechnical Engineering authored by Associate Professor Paul Hagan, Professor Shuren Wang and Dr Chen Cao (right).

The second book, Advances in Rock-Support and Geotechnical Engineering was co-authored by Associate Professor Paul Hagan, Professor Shuren Wang (UNSW Adjunct Professor) and Dr Chen Cao. The book, published in the second half of 2016, focuses on recent research in ground control by the authors where in the case of the research by Paul Hagan much of work was funded with the support of ACARP.

Research student completions
With the greater focus on research there has been a commensurate increase in enrolment and supervision of higher degree research (HDR) students particularly PhD students. The number of PhD completions jumped to a record of six in each of 2015 and 2016.

Figure 14. Increase in PhD student completions.

ENGAGEMENT
Staff news
In recognition of his long involvement in the transfer of Australian sustainability practices, Associate Professor David Laurence, founding Director of the ACSMP, received a special award at the Hanoi University of Mining...

Figure 12. Emeritus Professor Jim Galvin (centre), displaying his book with Associate Professor Paul Hagan (left) and Tony Egan (right).
and Geology for his “contribution to scientific development and international cooperation at the university.”

David was similarly honoured by the Society of Mining Professors (SOMP) for his “contributions to Sustainable Development practices in mining and his SOMP leadership in the Capacity Building programs of the Society worldwide” with an Emeritus Award at the annual meeting held during September in Washington DC.

Dr Wendy Timms was appointed to the Independent Expert Scientific Committee (IESC) on Coal Seam Gas and Large Coal Mining Development established by the Australian Government.

Wendy was invited to join a panel of eight experts that provides scientific advice to decision-makers on the impact that these resource development projects may have on Australia’s water resources. She will focus on the potential hydrogeology impacts of these proposed projects, in the broad context of natural resource management.

The IESC aims to improve the collective scientific understanding of the water-related impacts of coal seam gas and large coal mining developments through an independent and transparent process that builds confidence in the science used in decision making.

MEA student conference
UNSW Mining Engineering hosted the 2016 MEA Student Conference, an annual event where 20 students are selected to attend from across the MEA universities. The students present the results of their Honours research project. The event was held at the EY Offices in the Sydney CBD. As well as offering excellent facilities, the venue provided a wonderful vista across Circular Quay and Sydney Harbour to students visiting from interstate.

First and fourth placed prize winners went to two UNSW students, Adam Humphrey and Adrian Cumerlato. Also in attendance from UNSW were Zachary Barnes, Albert Borysiewicz and Paul Tsihlis.

Student mining games
A record number of students attended the 2016 AusIMM New Leaders Conference and Mining Games in Brisbane. One of the six UNSW teams gained second place in the games. Congratulations to Harrison Lau, Ethan Harvey, Ateeq Ur Rahman, Giverny Chomiszak, Mel Wherry and David Boulton on this achievement. A UNSW team also participated in the International Mining Games hosted by ITB in Bandung, Indonesia.

UNSW/AusIMM special speaker series
This annual event held on campus featured Eric Strom who presented to students and industry participants on ‘Lessons learned throughout a mining career that every mining engineer can use to demonstrate their abilities and fast-track their career.’

Annual public lectures
The 2016 Mitsubishi Minerals Sustainability Lecture was delivered on Thursday 19 May by Ms Liz Watts, Operations Manager for Glencore and a UNSW Mining Alumni, on the topic of ‘The Diversity Imperative’.

The 19th Annual Kenneth Finlay Memorial Lecture was delivered by Mr Andrew Cole, MD and CEO of OZ Minerals on Thursday 8 September in the UNSW Law Library to a packed audience. The theme of the lecture
was “Is thinking and acting differently the key to modern mining?” The level of interest was reflected in the number of questions asked at the end of the lecture.

The workshop convenor, Professor Ismet Canbulat, applauded the contribution of participants at the workshop and said that “this workshop highlighted the fact that despite extensive research around the world coal burst still remains as one of the critical and longstanding engineering problems facing the coal mining industry.”

UNSW minerals summer school
The summer school is aimed at increasing interest among high school students in pursuing a career in the minerals industry and was run in the new, more intense three-day format led by Professor Fidelis Suorineni. Fifteen students visited mines in the Central West at Newcrest Mining’s Cadia Gold Mines and Centennial Coal’s Airly Mine.

UNSW open day
A range of events and activities were organised for the annual UNSW Open Day in an effort to attract a greater level of interest in the mining program. Portable 3D headsets were used for the first time to transport students to mine sites across Australia. The gold-panning exhibit caught the attention of many students perhaps allured by the prospect of making a fortune under the guidance of Associate Professor Michael Hitch.
equipment and materials used in our day to day life, the School commissioned a project in partnership with MEA. The project created a VR experience particularly targeting high school students. Unlike other VR projects developed in the School, the project used Samsung Gear VR system that is relatively affordable thereby increasing its accessibility as shown in Figure 21.

Figure 22. The VR headsets at the centre of the Mineral Awareness Virtual Reality Experience held the interest of visiting students.

The product titled the Mineral Awareness VR Experience shows users the chemical elements that go into the making of a smartphone and the minerals needed for this. It then takes the student on a journey to a number of mine sites around Australia providing on-site interviews of site staff followed by a number of questions. This module has been deployed across 36 headsets at the four MEA universities and in the School’s 360° Interactive VR Theatre.

A strategic plan is being developed to further develop the capabilities and features of the VR facility to enhance the student experience.

IMARC2016

As part of the marketing strategy to broaden the links with industry, government and other stakeholders as well as individual potential students, the School set up a booth in the Melbourne Convention and Exhibition Centre during the three-day event. Associate Professor Michael Hitch delivered one of the special lectures on his vision of the strategic direction of the ACSMP.

New UNSW Minerals scholarship program

In order to gain more interest in the undergraduate mining program, a new scholarship program was launched for student entry in 2017. The $1.14M program allows for 25 new scholarships each valued at $48k over the four-year period. The program was launched by Paul Flynn, MD and CEO Whitehaven Coal at a special media event in November. A number of career dinners for high school students were hosted around the state in December.

High school student visits

Figure 23. Some of the members of the UNSW team who attended IMARC2016.

Figure 24. Some of the student visitors to UNSW during 2016 (from top):
- Indigenous Australia Engineering Summer School (IAESS) students estimating the amount of “mineral resources” contained within a choc-chip cookie;
- High school students “inspect” a longwall operation in AVIE, the School’s advanced 3D virtual reality laboratory; and
- Honeywell high school students learning more about the contribution mining makes in their lives through the Mineral Awareness VR Experience.
ALUMNI NEWS

Bob Cameron, UNSW mining alumni and currently Chairman and non-executive Director of Centennial Coal, received the 2016 UNSW Alumni Award in May for his services to the mining sector. Among many other roles, Mr Cameron is Chairman of the School’s Minerals Industry Advisory Council.

Figure 25. Bob Cameron (right) presented with the UNSW Alumni Award by Professor Mark Hoffman, Dean UNSW Engineering.

Megan Kline (nee Clasberg), BE (Mining) 2007, was awarded the 2016 WA CME Outstanding Young Woman in Resources Award, in May.

The award recognises an outstanding young woman who has shown significant promise and achieved important career milestones in the resources sector. Ms Kline is currently a Mining Superintendent at BHP Billiton Iron Ore at the Jimblebar Mine.

Figure 26. Megan Kline, UNSW mining alumni and receipt of the WA CME Outstanding Young Woman in Resources Award.

INFRASTRUCTURE

The new expanded Mineral Processing and Water Laboratory was opened mid-year. This will allow further expansion of research in these areas lead by Dr Seher Ata and Dr Wendy Timms.

As part of the infrastructure redevelopment undertaken in the School, the Australian Centre for Mine Ventilation was relocated to a new dedicated area. The revamped student ventilation laboratory was developed with expertise and equipment donated by Howden Australia who has been a long-term partner of UNSW in mine ventilation education and training.

Figure 27. Dr Seher Ata inspecting the test facilities in the new Mineral Processing Laboratory.

Figure 28. Students working in the newly refurbished mine ventilation laboratory.

Paul Hagan
Associate Professor and Head
School of Mining Engineering, UNSW Sydney
10 April, 2017
RESEARCH PUBLICATIONS

ATA, S, 2016. Interactive visualisation of a base metal concentrator, Quebec City, Canada, (Canadian Institute of Mining, Metallurgy and Petroleum).


HEBBLEWHITE, B and GRAY, R, 2016. Non-conventional surface


Wollongong, (eds: N Aziz and B Kininmonth) (University of Wollongong).


TIMMS, W A, 2016. Conceptual models of risks to shallow aquifers and base flow to streams due to underground mining through geological fault structures, Montpellier, France.


VANDERMAAT, D, SAYDAM, S, CROSKEY, A and HAGAN, P C, 2016. Laboratory based coupon testing for the understanding of SCC in rockbolts, Mining Technology, 10.1080/14749009.2015.1122296.


15


ZHAI, H, HAGAN, P C and LI, D, 2016. Sample size and sample strength effects on testing the performance of cable bolts, in *Proceedings of 16th Coal Operators’ Conference*, University of Wollongong, (eds: N Aziz and B Kininmonth) (University of Wollongong).


INVITED LECTURES, FORUMS AND OTHER STAKEHOLDER ENGAGEMENTS


CANBULAT, I, 2016. Update on ACARP coal burst project C25004. Delivered by I Canbulat at International Workshop on Coal and Rock Burst, University of Wollongong, Wollongong, 27 Nov.

CANBULAT, I, and HEBBLEWHITE, B, 2016. Australian coal burst research update. Invited Lecture by I Canbulat and B Hebblewhite at School of Mines, CUMT, Xuzhou and College of Resources and Safety Engineering, CUMTB, Beijing, 10-14 October.


CHALMERS, D, 2016. Real time respirable dust. Presentation by D Chalmers at AusIMM Kalgoorlie Branch, 9 May.


HEBBLEWHITE, B, 2016. Sandy Creek Waterfall—a case study of successful management of the potential impacts of longwall mining on a sensitive natural surface feature. Invited Lecture by B Hebblewhite at School of Mines, CUMT, Xuzhou and College of Resources and Safety Engineering, CUMTB, Beijing, 10-14 Oct.


LAURENCE, D C, 2016. Australian mining practices. One day seminar delivered by D Laurence at Seoul National University, Korea, 13 May.

LAURENCE, D C, 2016. Introduction to mining. Short course delivered by D. Laurence at Chulalongkorn University Thailand, Mar.


RAVAL, S, 2016. Remote sensing for mine safety and
environment. Invited presentation delivered by S Raval at University of Leoben- UNSW Australia research workshop, 18 Nov.

RAVAL, S, 2016. UAS photogrammetry and remote sensing applications in Mining. Invited presentation delivered by S Raval at the UAS Image Acquisition and Processing Workshop, UNSW, 23 Nov.


SAYDAM, S, 2016. Mining engineering research UNSW. Delivered by S Saydam at the Federal University of Rio de Janeiro, Brazil, 18 Oct.


SUORINENI, F.T. 2016. Orebodies in shear – lessons learnt. Invited Lecture by F Suorineni at College of Resources & Civil Engineering, Northeastern University, Shenyang, China, 6-11 November.

SUORINENI, F.T. 2016. Benefitting from Big Data in the mining industry – food for thought. Invited Lecture by F Suorineni at College of Resources & Civil Engineering, Northeastern University, Shenyang, China, 6-11 Nov.

