Welcome to the Careers Advisers and Teachers Conference

21 February 2020
We acknowledge the tradition of custodianship and law of the Country on which the University of Sydney campuses stand. We pay our respects to those who have cared and continue to care for Country.
Welcome Address

Shane Griffin
Executive Director,
Sydney Future Students

The University of Sydney
Introducing…

Sydney Future Students
Admissions | Domestic | International

Admissions
- Local
- International
- Higher degree research

Domestic
- Sydney
- Regional and remote
- Indigenous recruitment
- Low SES and pathways

International
- Onshore
- International recruitment
- Global mobility
- International Partnerships

Strategy & Faculty Partnerships
- Faculty liaison
- Applicant conversion
- Events
- Market intelligence
Domestic Team

Bonnie Cousins
Director, Domestic

Erin Keech
Student Recruitment Manager

Tamsyn Richards
Senior LSES & Pathways Coordinator

Beth Downey
Student Outreach Assistant

Lauren Ribbon
Student Ambassador Assistant
Domestic Team: still to come…

March
- Senior Indigenous Recruitment Coordinator
- Indigenous Recruitment Assistant

Advertising
- Outreach Coordinator
- Outreach Assistant
- Regional Recruitment Assistant
What will be important to us?

Being open and welcoming

Increasing diversity
  – of schools, background, choices of study

Academic quality
  – through ATAR and other considerations

Our role in the community
  – partnerships
Undergraduate CSP Offers

Total Offers
14,831
+ 3.6%

Total Enrolments
8,003
+ 3.3%
2020

1st

All Preferences

1st Preferences

99.95 ATARS

Market share

95+ ATARS
1st Preference Degree Demand

> 40% increase in demand

- Social Work
- Advanced Computing/Bachelor of Commerce
- Advanced Computing/Bachelor of Science
- Arts/Bachelor of Social Work
- Economics/Bachelor of Laws
- Education (Health and Physical Education)
- Music (Composition)
- Science/Master of Nursing
- Visual Arts

Top 5 degrees by demand:
Science/Doctor of Medicine
Arts
Arts/Law
Commerce
Commerce/Law
Entry Scheme Offers

**Broadway**
1,455  
+ 22.1%

**Gadigal**
38  
- 46%

**E12**
511  
+ 23.4%

**Future Leaders/DUX**
567  
- 4.7%

**Elite Athletes and Performers**
123  
- 3.1%
Academic Excellence Scheme

6,486
Offers made to eligible applicants

5,550
AES not required for offer

936
Made an offer due to AES
Meeting the maths prerequisite: MOOC

The University of Sydney introduced mathematics course prerequisites for some degrees in 2019.

For those students who had not completed the required maths at school, they had the option of completing the MOOC. In 2019:

65 completed the MOOC
48 passed
17 failed
Questions?
WHAT’S AN ICPU?

INDUSTRY AND COMMUNITY PROJECT UNIT

- Interdisciplinary student teams work on authentic problems set out by industry, community and government organisations
- Built-in to liberal course majors, elective in specialist/professional courses
- Semester long (13 week) or intensive (4 week) project units (Australia, China, India, Italy, Singapore, U.S and the UK)
- Third year (Bachelor) and fourth year (B Advanced Studies) projects
- 45 partners and over 50 projects in 2020
WHO CAN COMPLETE AN ICPU?

ICPU units are available to undergraduate students from*:

- Architecture, Design and Planning
- Arts and Social Sciences
- Business
- Pharmacy
- Health Sciences
- Engineering
- Conservatorium of Music
- Law
- Science

* ICPUs meet the interdisciplinary project requirement in our liberal course majors (and the B Advanced Studies).

ICPUs are also available as an elective in some of our professional/specialist courses. The course resolutions (handbooks) advise students whether and how they can complete the ICPUs.
THE STUDENT EXPERIENCE

STUDENT PANEL

Hayfa Bakour - Bachelor of Science (Psychology)

Kundai Khuleya - Bachelor of Commerce/Bachelor of Laws

sydney.edu.au/students/industry-and-community-projects
USEFUL SITES FOR INFORMATION

About ICPUs:
- sydney.edu.au/students/industry-and-community-projects

ICPU eligibility:
- sydney.edu.au/students/industry-and-community-projects/enrol-icpu

ICPU partners and projects:
- (Bachelor) sydney.edu.au/students/industry-and-community-projects/projects-and-partners
- (B Advanced Studies) sydney.edu.au/students/industry-and-community-projects/4000-level-projects
STUDENT EXPERIENCE PROGRAM 2019-2021
Students at the centre

Our overarching aspiration is for an outstanding student experience, one that results in each student being and feeling connected to the University community, fully engaged in learning and achieving excellent educational outcomes.
The University of Sydney aims to lead the sector in Student Experience by 2025.

The Student Experience Program is laying the foundation for long term evolution towards an outstanding student experience.

**OUR FUTURE**

**STUDENT EXPERIENCE PROGRAM 2019-2021**
... we are making incremental improvements for students to improve their experience

**2021-2024**
... students are reporting a strong sense of belonging and are feeling more connected, empowered, valued and inspired

**2024 ONWARDS**
... we are delivering a transformation to student experience with a clear and consistently shared feeling of an enduring connection to the University community
Our Conceptual Model of the Student Experience

Relational Core
- Belonging
- Learning
- Participating

Transition and Navigation
- Selecting
- Joining
- Navigating
- Accessing
- Finishing

Essential Supports
- Living
- Transacting
- Enabling
# TRANSFORMING THE STUDENT EXPERIENCE – THE JOURNEY

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<td>I participate in a range of opportunities that help me become professionally ready</td>
<td>The University helps me decide on career or further study options and provides application assistance</td>
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<td>I receive formal recognition for further learning and can use this for my next steps</td>
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<td>The University helps me celebrate my achievements and connects me with the global alumni community</td>
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<td>I am confident with my next steps and comfortable to navigate support available outside of the University environment</td>
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Any questions?
Research-led Teaching
Highlights from our multi-disciplinary research initiatives

MC
Dr Seán O’Reilly
Head, Research Education
Faculty of Medicine and Health
Artificial intelligence engineering in healthcare
Hype or truth?

Presenters
Dr Ashnil Kumar
Lecturer, School of Biomedical Engineering
ARC Training Centre for Innovative BioEngineering

Dr Audrey P Wang
Senior Lecturer in Digital Health, Westmead Medical Precinct, Faculty of Medicine and Health

https://medicalfuturist.com/robotics-healthcare/
Complementary expertise

Who am I?
- Computer science researcher
- Works in machine learning and artificial intelligence
- Lots of work in medical image analysis
- Develops algorithms and software tools
- Collaborates with Westmead, Nepean, and RPA hospitals

Who am I?
- Clinician researcher
- Works as a hospital clinician, health technology implementation research and educator.
- Background in physiotherapy, behavioural neuroscience, pain and imaging research.
- Applies computational and statistical tools to improve diagnostics and patient outcomes.
A new type of industry in medicine – the new frontier of AI

Convergence of
- genomics, biosensors, EHRs and smartphone apps, (acquisition)
- superimposed on a digital infrastructure, (platforms)
- with artificial intelligence to make sense of the (algorithms)
- overwhelming amount of data created (scale)

FUTURE FRONTIERS
EDUCATION FOR AN AI WORLD
EDITED BY LESLIE LOBLE, TISH CREENAUNE AND JACKI HAYES

First published 2017
© State of New South Wales
(Department of Education)
My father smoked a lot and it was not only his addiction but it was how he had to live his life. It was like a compulsion and that is how I knew I couldn't just kick him out.

My parents instilled in me that it was not acceptable to let someone else make your choices for you.

While my father's addiction did derail his job prospects for many years, he saved up and decided to pursue what he was passionate about.

My parents never gave me a reason to go through with it and one day the day I told him I didn't want to go back he said I was strong and it was hard for him to accept that, but it was something that he had to accept. He took me to meet my
"My father smoked a lot and it is a big part of who I am, my trademark," he says.

"And cannabis was just my gateway drug." Back in his oil-rubbed brooder, he can remember feeling a strange sense of freedom when he finally tasted marijuana after years of abstinence. And, almost after a week of growing his own, he discovered that not only was it possible, he says, to grow it "wide open" or "intensely." "I found out that even if you are going to get high, the highest concentration of THC is on the leaves, and not on the buds," he says. It wasn't long before Mr. Biro proudly walked out of the marijuana room with
Identifying normal and abnormal structures in image data

Bi et al., MICCAI CMIG 2015.
Bi et al., CMIG 2017.
Effect on teaching: Engaged enquiry and project-based learning

Philosophy: get students involved at every stage

- Engage the stakeholders (clinicians, hospital administration, etc.)
  - Learn to work across disciplines
  - Discover practical, social, organisational limitations of technology
- Own the problem and the solution
  - Guidance but not a lot of rules
  - Research the problem, and learn things outside comfort zone
  - No mandated solution: students create it
- Future thinking
  - Convince us that the solution will work
  - Leave behind documentation that others can build on
- Teamwork
  - Intra- and inter-disciplinary teams
Ongoing Student Project – Smart Sensors for Pressure Injuries

1. Removable antibacterial cotton
2. Absorbing layer (cotton)
3. Moisturise matrix (top)
4. Absorbing layer (cotton)
5. Moisturise matrix (top)
6. Absorbing layer (cotton)
7. Pressure sensing matrix (top)
8. Nonwoven aramid fabric
9. Pressure sensing matrix (bottom)
What do employers look for?

**Graduate Engineer Interview**
Anonymous Employee in Bella Vista

**Interview Questions**
Why do you want to work at ResMed and what do you know about our product and services?

Answer Question

Describe an innovative solution you were apart of.

Answer Question

Tell me a time when you had to influence a team or an idea.

Answer Question

Describe a conflict you had.

Answer Question

**Intern Interview**
Anonymous Employee in Tempe, AZ (US)

**Interview Questions**
Describe the steps you would take to design [common product].

1 Answer

Where do you see yourself fitting well with this Company

Answer Question
The interdisciplinary BMET3921 unit gave me a better understanding of what it’s like to work in the biomedical industry than any other unit I have taken. Working directly with clinicians improved my professional and collaborative communication skills substantially, and changed the way I approach engineering design. As a result, this helped me to obtain an internship at ResMed, putting me on a promising career path. I highly recommend units like BMET3921 to any students serious about obtaining a position in the biomedical industry.

Domantas Kuzinkovas
Biomedical Engineering
Health Technology Innovation
Biomedical Informatics and Digital Health
Optimizing Pharmacy Procurement in an Australian Hospital

Presented by
Dr. Erick Li
Discipline of Business Analytics
1. Introduction

Monthly Pharmacy Expenses of Westmead Hospital (1.2016-5.2017)

Source: Pharmacy Director of Westmead
1. Introduction

Prevalence of rebate contracts

Westmead signed pharmaceutical pricing and rebate agreements with multiple vendors such as Amgen, Roche, Juno, Apotex, Mylan, Baxter, Astellas, and Janssen.

- With a rebate contract, the choice of the brand for each SKU must consider the accumulated volume, rebate target, rebate discount, and the current price of the non-rebate brand.

- With hundreds of SKU on multiple rebate contracts, the Decision Making Tool must be able to quickly solve the optimal solution.

- The algorithm is based on a dynamic programming (DP) model.
2. Our Contributions

We developed a *decision making tool* to assist with WSLHD supply chain and procurement of pharmaceuticals through data analytics. We can use the DMT to:

1. **Collate** price and rebate information from vendors
2. **Recommend** whether switch to a generic brand and/or vendor or stick with the status quo
3. **Forecast** the demand for each SKU
3. A Retrospective Study

Retrospective Test

21 high-volume medications were chosen. From January 2016 to May 2017, the total expenditure was $3.23M.

The algorithm generated an optimal strategy that resulted in a retrospective saving of $152K.

The saving is \( \sim 4.7\% \) of the total expenditure.
4. Research-Based Teaching

This project has been used as a case study in QBUS3320 Supply Chain Management.

The relevant tools (such as forecasting, dynamic programming, and contracting theory) are taught in QBUS2310 Management Science, QBUS2820 Predictive Analytics, and QBUS3310 Advanced Management Science.

This project also involves project management (PM) principles, which are covered by QBUS3350 Project Management.

The programming language (i.e., Python) has been taught in QBUS1040 Foundations of Business Analytics.
4. Research-Based Teaching

My teaching philosophy is to integrate state-of-the-art research and my industrial experience into my teaching materials and my students’ learning activities.

— Simulation is my favourite teaching tool to engage students and allow them to test their newly acquired skills. Comments from students include:

  • “The simulation is really interesting and I was amazed by this assignment.”
  • “The simulation assignment gave me a comprehensive view about how supply chains work and how procurement is managed in an organisation.”

— I received the Dean’s Citation for Teaching in S2, 2016. I was also named by Babbar et al., (2017, 2018) as one of Asia’s top 25 scholars in Operations Management and Supply Chain Management.
Optimizing Pharmacy Procurement in an Australian Hospital

Comments or questions?
Highlights from our Design Lab

Presented by
Dr Martin Tomitsch
Faculty of Architecture, Design and Planning
Design @ Sydney

**Undergraduate**
Bachelor of Design Computing  
Major in Design  
Major in Biological Design

**Postgraduate**
Master of Interaction Design and Electronic Arts (M.IDEA)  
Master of Design (Design Innovation)  
Master of Design (Strategic Design)
Loading your recommendations...

Step One

Let’s apply our target function in the center of the screen with a random number of circles and a random size each time we load it so it looks something like this.

```javascript
function setup() {
  createCanvas(windowWidth, windowHeight);
  noStroke();
}

function draw() {
  background(220);
  // Put your target function here
  noLoop();
}

function target(x, y, size, circleNum) {
  for(let i = 0; i < circleNum; i++) {
    if (i % 2 == 0) {
      fill(255);
      circle(x, y, size);
    } else {
      fill(0);
      circle(x, y, size);
    }
  }
```
News

University of Sydney design students 'hack' needle phobias

21 May 2019

Design thinking used to help support children with severe needle phobias

Students from the School of Architecture, Design and Planning participated in a 'hackathon' at the Westmead Education and Conference Centre in Westmead Hospital on 12 April to support children with severe needle phobias.

The design brief asked students to design an innovative technology to help children with needle phobia, which often prevents them from completing their immunisation schedule. The students were given two weeks to research the topic and define the problem based on collected evidence, develop an idea, and test their concepts using low fidelity prototypes.

Pull the Trigger to begin
Interdisciplinary field schools in Southeast Asia: Water in Singapore

Presented by
Dr Natali Pearson
Curriculum Coordinator
Sydney Southeast Asia Centre
Natali.Pearson@sydney.edu.au
Building trust, covering content, working across disciplines
Multiple perspectives
Student-led interdisciplinary research projects: water as a lens
“It was hugely intellectually rewarding and challenging, which in itself could be the best aspect. However I think that what really stood out to me was the way in which the coordinators fostered a space where we could critically engage in the issues at hand and question ourselves and each other. I was so impressed. There was never anything left unaddressed.”

“The in-country and multidisciplinary aspects were wonderful. I was really encouraged to learn and think outside of my familiar boundaries, meet great people, and had fun while doing so.”

“I never thought I would love the teamwork part before! All my team members are so open, smart, funny and hardworking. We had a great time to develop our own research project together. Also, the research project gave us so much freedom to explore what we are interested in. It is really cool to have this kind of experience before make career choice. Now I am sure I wanna do more research in the future!”
Thank you

For more information visit:
The Psychology of Coaching: Resilience

Dr Michael Cavanagh
Senior Lecturer, Coaching Psychology Unit
What is resilience?
What is resilience?

- Comes from the Latin verb resilire, or ‘to leap back’
- OED definition:

  ‘Being able to withstand or recover quickly from difficult conditions’

Resilience as a trait

- Wagnild and Young (1993) Resilience is “the characteristic of an individual which facilitates adaptation and moderates the negative impacts of stress.”
- “This is made up of stable personal factors including: reflectiveness, positive responsiveness to others, above average intelligence, equanimity, self-reliance, meaningfulness, a wide range of personal and social activities and interests, perseverance, and an optimistic and energetic approach to life”.
How is resilience currently seen?

As a characteristic of a person:
- Personal trait
- Combination of internal resources
- Response
- State

Resilience is seen as an intra-personal capacity that enables positive outcomes in the face of adversity.

An antidote to resistance to change, burnout and mental health issues in the workplace and in schools

What problems are resilience programmes hoping to solve?

- ‘Resilience’ was seen to be the key organising concept for mental health interventions in schools. The concept was viewed as narrowly focused on attitude towards—and performance in—school work, with individuals being encouraged to ‘push on through’ difficulties to achieve success. Young people were critical of this approach, suggesting several alternatives.

What problems are resilience programmes hoping to solve?

"People in the workplace have heavier workloads now and are working under enormous pressure as we enter the 'getting more from less' era (Chartered Institute of Personnel & Development, 2009). This pressure, moreover, has extended to family life as median incomes have depreciated to balance an ailing economy (Office for National Statistics, 2013). Not surprisingly then, during the period of global recession, work-related stress soared by 40% and absentee rates increased by 25% (Houdmont, Kerr, & Addley, 2012). The need for personal resilience, especially in the workplace, has never been greater."

— Resilience Training in the Workplace from 2003-2014: A Systematic Review

Do resilience programmes work?

• Robertson Cooper Sarkar and Curran (2015) in a systematic review of resilience training found:

1. "Despite conceptual and theoretical support for resilience training, the empirical evidence is tentative, with the exception of a large effect for mental health and subjective well-being outcomes."

2. "Most programmes utilize a cognitive-behavioural approach to developing resilience."

3. "At this stage, there is no definitive evidence for the most effective training content or format, but it would appear wise to include an element of one-to-one training and support based on individual needs."
**SO what is the problem?**

- I think we have a faulty understanding of resilience for three reasons:
  1. We define it in terms of its outcomes, not in terms of its characteristics
     - The Forest Gump approach
  2. We are making, what is called in philosophy, an error of kind.
     - We see it as a property of the person when it is a relation.
  3. Therefore, we use the wrong unit of analysis
     - By decontextualizing resilience we measure the person not the system

**Fitness landscapes (Kaufman)**
The landscape

The challenge

– We need redundant capacity in order to deal with the challenges of our ever changing and ever increasingly changing landscapes

– Where do we find this additional capacity?
  – Resilience programmes say we have to find it within ourselves
    • In other words, you should be tough enough for any challenge, so get a tougher hide.
    • But can we always do this…?
A better definition of resilience.

- Resilience is a relation between a subsystem (student, class, school) and the environment in which they are challenged.
- It requires the possession of redundant resources (both internal and external) that can be bought to bear on the challenge.
  - These redundant must be sufficient to the challenge being faced and available across the whole time-frame of that challenge.

This means:
- Building resilience is about building resource-full environments. It is about enabling access to the external resources needed to face the whole set of challenges to be found in the context.
- This is true for both individuals and for any larger system.

How do internal and external resources create resilience?

[Diagram showing the flow of immediate challenge, acquired resources, developed resources, redeployed resources, perceived available resources, and the relationship between short-term and long-term adaptive benefits and costs.]
**Our key challenge in building resilience**

In building resilience we need to think at all levels of the organisation

- What challenges do we face
- What resources do we need to face those challenges
  - External resources
    - How do we ensure the resources are available to meet challenges
    - How do we build resource full systems
    - How do we support our people to face the challenges.
  - Personal characteristics
    - How can we improve our mental and emotional capacities so that we can use the resources available to meet the challenges
    - How well do we recognise that nobody can meet every challenge
      - How do we build support into the system
      - How do we create the space to not be perfect and to learn

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**Stretch and performance**

adapted from Yerkes Dodson, 1908

[Diagram showing the relationship between stretch/anxiety/arousal level and performance/well-being, with zones for short-term and long-term effects.]
Discussion

• Any thoughts, questions or comments you would like to share?

Thankyou

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