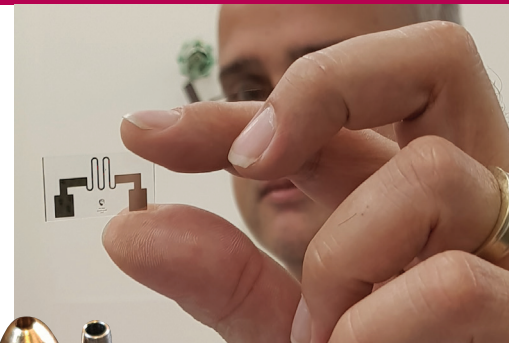
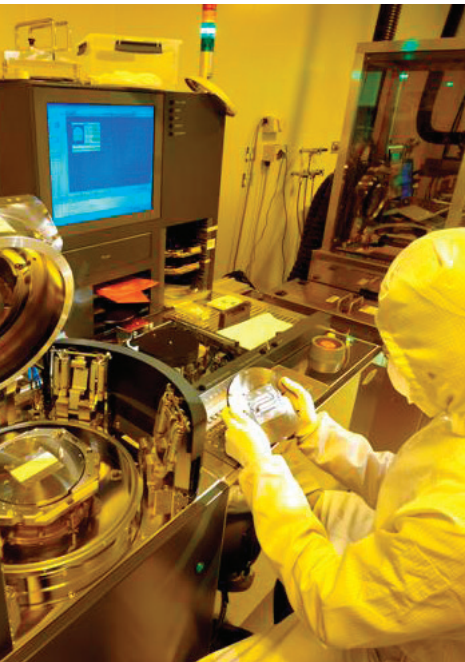


ANFF-SA **Microengineering Winter School**



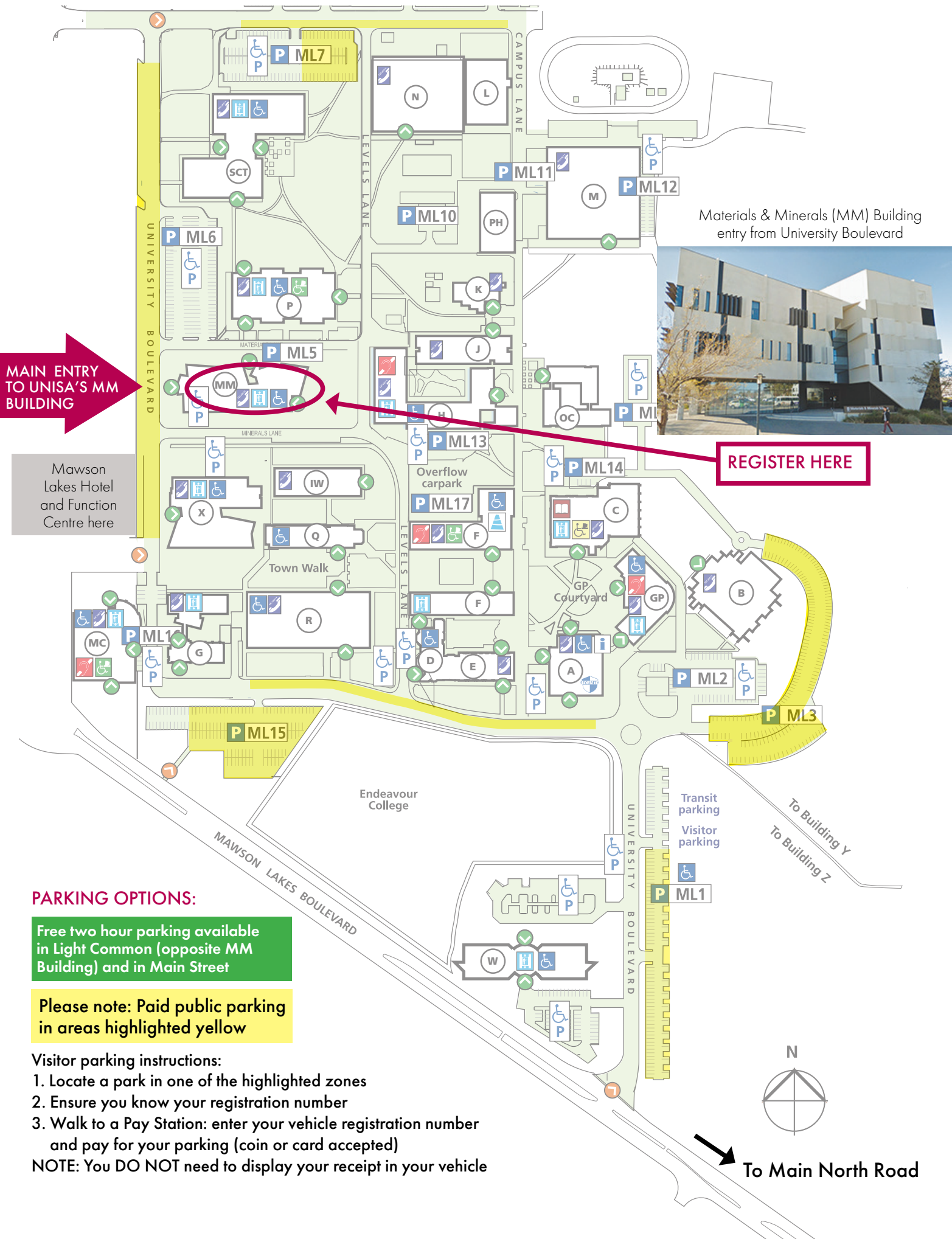
Tuesday 13th to Friday 16th July, 2021

Building MM, Room 1-05, Mawson Lakes Campus,
University of South Australia



The South Australian Node of the
Australian National Fabrication Facility
Providing micro and nano fabrication facilities for Australia's researchers





Materials & Minerals (MM) Building entry from University Boulevard

MAIN ENTRY TO UNISA'S MM BUILDING

Mawson Lakes Hotel and Function Centre here

REGISTER HERE

PARKING OPTIONS:

Free two hour parking available in Light Common (opposite MM Building) and in Main Street

Please note: Paid public parking in areas highlighted yellow

Visitor parking instructions:

1. Locate a park in one of the highlighted zones
2. Ensure you know your registration number
3. Walk to a Pay Station: enter your vehicle registration number and pay for your parking (coin or card accepted)

NOTE: You DO NOT need to display your receipt in your vehicle



To Main North Road



TUESDAY, JULY 13

TIME	SESSION
8.45am	Registration Foyer of Building MM
9.00am	Opening remarks A/Prof. Craig Priest, ANFF-SA Director, Future Industries Institute, UniSA
9.05am	Welcome (online delivery) Dr Cathy Foley, South Australia's Chief Scientist
9.10am	Overview of ANFF-SA Microengineering Winter School A/Prof. Craig Priest, ANFF-SA Director, Future Industries Institute, UniSA
9.40am	INSIGHT: Lab on a chip: miniaturising the chemistry laboratory (online delivery) Prof. Michael Breadmore, ARC Future Fellow, University of Tasmania
10.10am	MORNING TEA
10.30am	LECTURE ONE: Thin film coatings A/Prof. Colin Hall, Foundation Fellow, UniSA
11.10am	LECTURE TWO: Photolithography Dr Maryam Khaksar, ANFF-SA Nanofabrication Technologist, UniSA
11.50pm	LUNCH + GROUP PHOTO
12.50pm	PRACTICAL SESSION ONE
2.20pm	AFTERNOON TEA
2.40pm	PRACTICAL SESSION TWO
4.10pm	UniSA Future Industries Institute tours with A/Prof. Colin Hall, Prof. David Lancaster and Euan Smith
4.50pm	CLOSE OF DAY

WEDNESDAY, JULY 14

TIME	SESSION
8.45am	Registration Foyer of Building MM
9.00am	Opening remarks A/Prof. Craig Priest, ANFF-SA Director, Future Industries Institute, UniSA
9.10am	INSIGHT: Speciality optical glasses & fibre: fabrication and applications Prof. Heike Ebendorff-Heidepriem, Deputy Director of the Institute for Photonics & Advanced Sensing, University of Adelaide
9.40am	INSIGHT: Advanced undersea sensor technology Dr Scott Foster, Principal Scientist, DSTG
10.10am	MORNING TEA
10.30am	LECTURE THREE - Etching Dr Donghoon Chang, ANFF-SA Microfabrication Technologist, UniSA
11.10am	LECTURE FOUR: Laser milling (online delivery) Dr Ben Johnston, ANFF OptoFAB Facility Manager, Macquarie University
11.50pm	LUNCH
12.10pm	Industry tours: Rapier and Tindo Solar
1.20pm	PRACTICAL SESSION THREE
2.50pm	AFTERNOON TEA
3.10pm	PRACTICAL SESSION FOUR
4.40pm	CLOSE OF DAY *NB optional Optofab tour, Adelaide University, Braggs Building, North Tce

SPECIAL DINNER/TOUR OPPORTUNITY

ANFF-SA Microengineering Winter School attendees are invited to visit ANFF Optofab node.

Wednesday July 14 • 6.00pm - 7.30pm

• Max 30 people • Free & registration essential



**ANFF
OPTOFAB**

**MORE DETAILS
COMING SOON!**



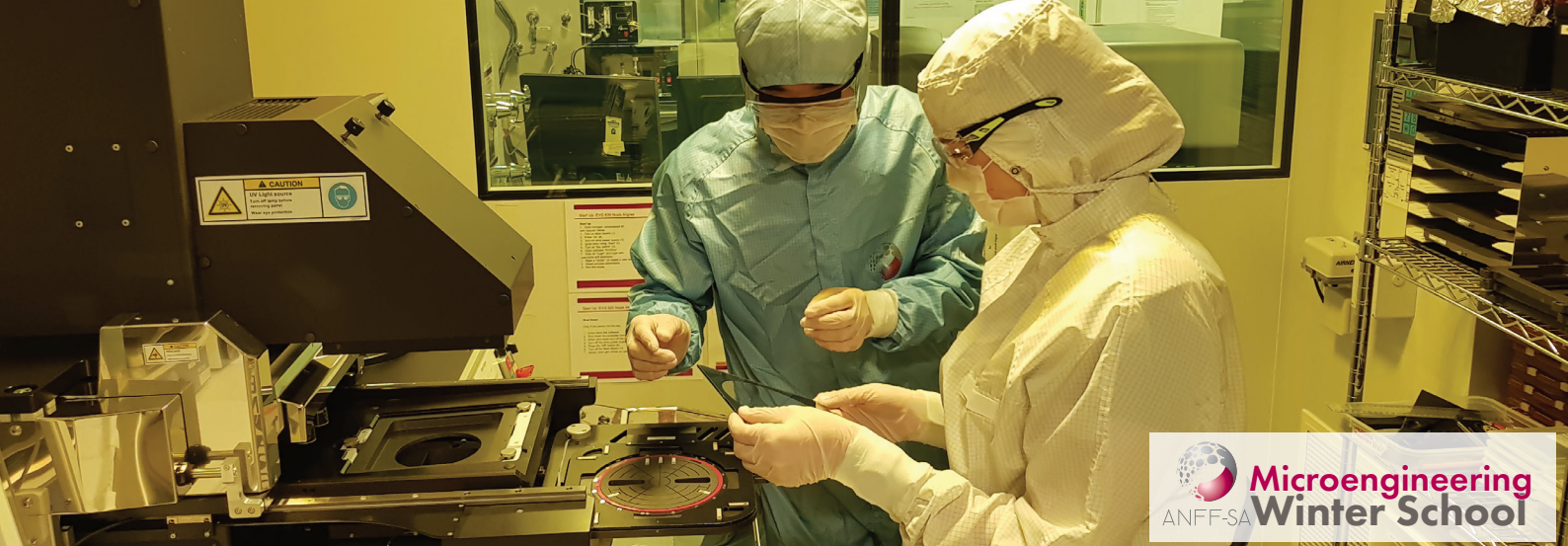


THURSDAY, JULY 15

TIME	SESSION
8.45am	Registration Foyer of Building MM
9.00am	Opening remarks A/Prof. Craig Priest, ANFF-SA Director, Future Industries Institute, UniSA
9.10am	INSIGHT: Medical Device Partnering Program - case study for success Prof. Karen Reynolds, Director, Medical Device Research Institute and the Medical Device Partnering Program, Flinders University and Dr Duy Tran, Research Associate, UniSA FI
9.40am	INSIGHT: Rapid Quantum Materials and Device Prototyping at Adelaide University Petar Atanackovic, Silanna
10.10am	MORNING TEA
10.30am	LECTURE FIVE - Micromachining Mark Cherrill, ANFF-SA Microfabrication Technologist, UniSA
11.10am	LECTURE SIX: Micro injection moulding Dr Jing-Hong (Mike) Pai, ANFF-SA Nanofabrication Technologist, UniSA
11.50pm	LUNCH
12.10pm	Industry tours: Rapier and Codan
1.20pm	PRACTICAL SESSION FIVE
2.50pm	AFTERNOON TEA
3.10pm	PRACTICAL SESSION SIX
4.40pm	CLOSE OF DAY

FRIDAY, JULY 16

TIME	SESSION
8.45am	Registration Foyer of Building MM
9.00am	Opening remarks A/Prof. Craig Priest, ANFF-SA Director, Future Industries Institute, UniSA
9.10am	LECTURE SEVEN - Packaging Coco Kennedy, Scientific Engineering Services, Research Services Division, DSTG
9.50am	LECTURE EIGHT - Fundamentals of wafer bonding (online delivery) Dr Thorsten Matthias, Regional Sales Director Asia-Pacific, EV Group
10.30am	MORNING TEA
10.50am	INSIGHT SEVEN: Micro-X: Seeing things differently Susanne Sahlos, Research Chemist & STEM Outreach Communications Officer, Micro-X
11.20am	INSIGHT EIGHT: Title: What it means to be a Biotech CEO: Walking the Walk, Talking the Talk Dr Deborah Rathjen, CEO, Carina Biotech
11.50am	Certificate presentation with A/Prof. Craig Priest and Dr Deborah Rathjen
12.20pm	LUNCH
1.00pm	PRACTICAL SESSION SEVEN
2.30pm	AFTERNOON TEA
2.50pm	PRACTICAL SESSION EIGHT
4.20pm	CLOSE OF DAY



Practical sessions

DETAILS & LOCATION

Practical 1 Photolithography (CLEAN ROOM)

Presented by: Dr Jing-Hong (Mike) Pai, ANFF-SA and UniSA
 Location: In this practical, you will follow the spin-coat, expose, and develop processes for micro-gear fabrication and heaters.
 Cleanroom

Practical 2 Etching(CLEAN ROOM)

Presented by: Dr Donghoon Chang, ANFF-SA and UniSA
 Location: In this practical you will become familiar with laboratory processes for etching of thin metal layers.
 Cleanroom

Practical 3 Design

Presented by: Simon Doe and Mark Cherrill, ANFF-SA and UniSA
 Location: This practical will cover lithographic mask fundamentals. You will also design parts using 2D and 3D CAD software.
 MM2-04

Practical 4 PDMS devices

Presented by: Mona Tarek Elsemary, UniSA and Farzaneh Mohammadbeigi, Flinders University
 Location: Hands-on experience casting PDMS on microchannel master structures. Chips will be bonded using plasma and you will test them in our microfluidics laboratories.
 MM2-11

Practical 5 Characterisation techniques

Presented by: Dr Jason Gascooke, ANFF-SA and Flinders University; Clare Kelly, Olympus; Son Ngyuen, Leica Microsystems
 Location: Learn how to use a scanning electronic microscope (SEM) to create images for examining a multitude of materials and for quality control/failure analysis. Observe and identify defects in a real device using a range of optical inspection techniques for characterising fabricated devices.
 MM2-10

DETAILS & LOCATION

Practical 6 Microelectrodes - NB 45 min session

Presented by: Igor Switala, DSTG and Dr Maryam Khaksar, ANFF-SA and UniSA
 Location: Introduction to wafer dicing and bonding. You will also electrically test some heaters made by thin film deposition and lithography.
 Q2-11

Practical 7 Electrical integration - NB 45 min session

Presented by: Said Al-Sarawi, Adelaide University
 Location: Build an electronic circuit that allows us to interface to a pressure sensor. Observe the pros and cons of the different interface circuits in simplifying the electronics or maximising the dynamic range of these sensors.
 Q2-11

Practical 8 Fabry-Perot pressure sensor - NB 45 min session

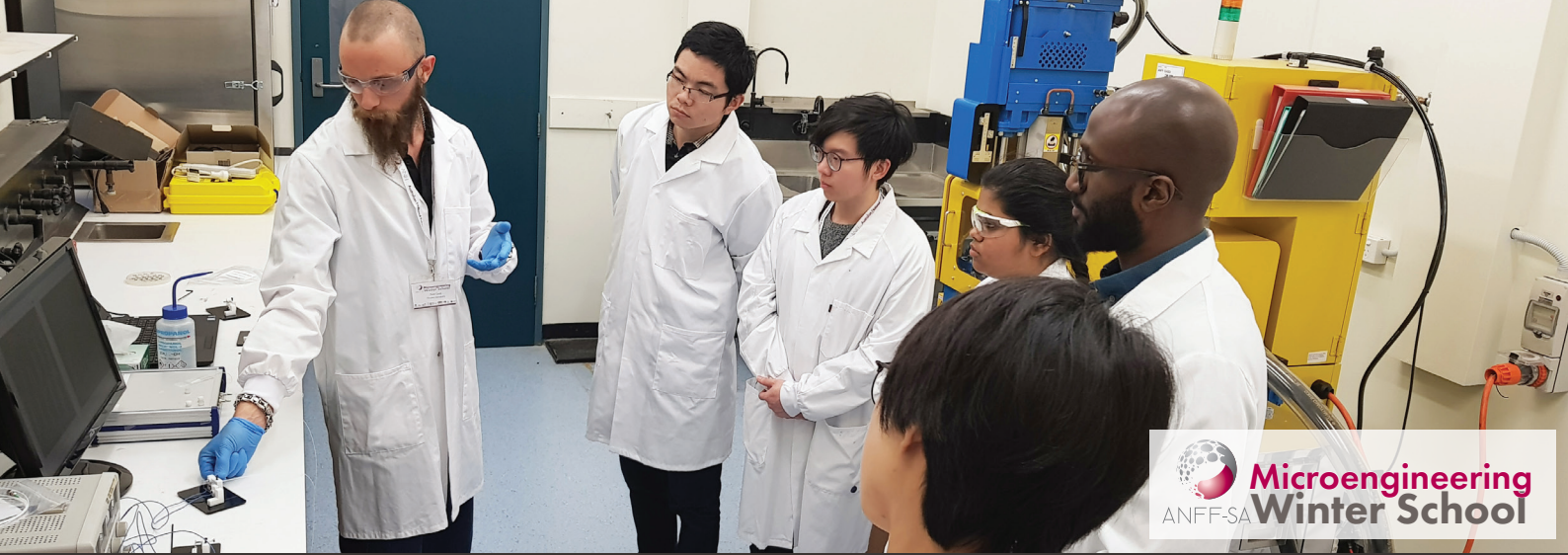
Presented by: Peter Cook, Flinders University
 Location: Build a Fabry-Perot interferometer, calibrate the device to measure small distances and impact of thermal effects. Develop an intuitive understanding of how optical equipment can allow sensing down to nanometre scales with basic optical fibre handling techniques.
 Q1-14

Practical 9 Optical communications - NB 45 min session

Presented by: Dr Nick Riesen, UniSA
 Location: Introduction to optical fibres and optical communications. Learn about the properties of fibre optics that have enabled the internet. Create a photonics setup that allows for sound to be transmitted on a light beam demonstrating the basics of telecommunications.
 Q1-14

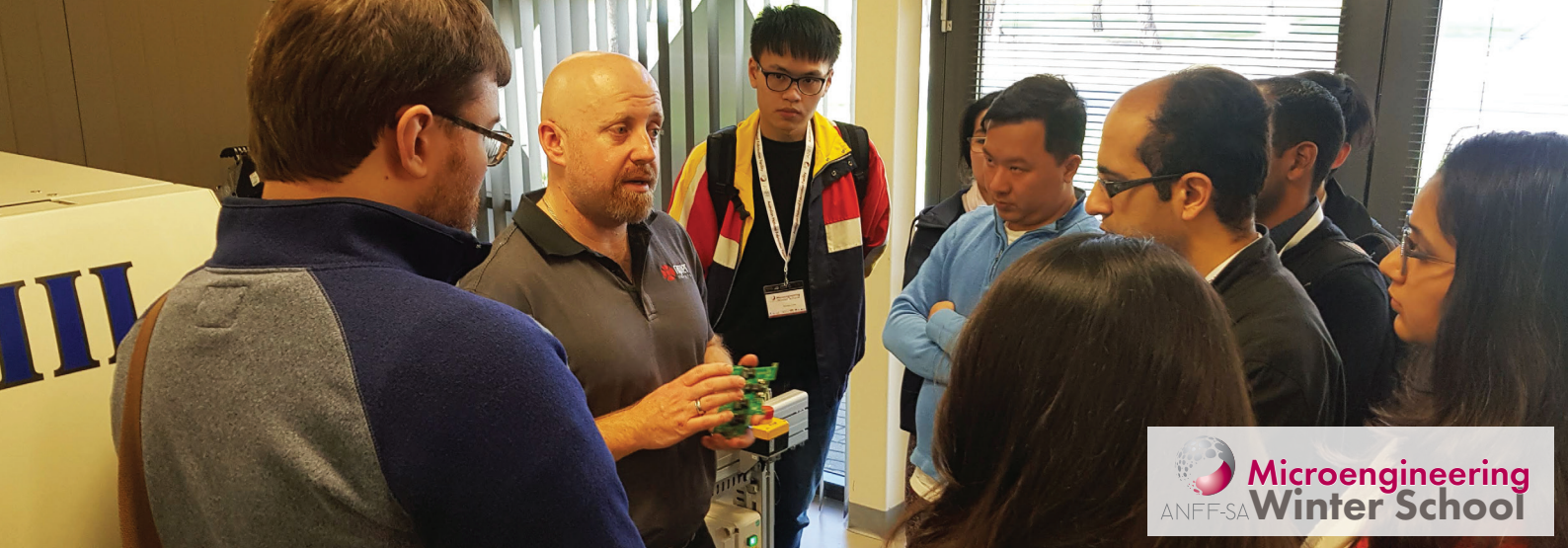
Practical 10 3D printing

Presented by: David Chan and Dr Kamil Zuber, UniSA
 Location: Introduction to 3D printing from an engineering perspective. You will learn about development and production methods, the various techniques and engineering materials available to achieve the desired properties suited to your application.
 Testlab



Participants will be allocated a practical session group at registration on Tuesday, July 13.
 Practical session schedule

	PRACTICAL	LOCATION	PRACTICAL SESSION GROUP NUMBER							
			TUESDAY		WEDNESDAY		THURSDAY		FRIDAY	
			1	2	3	4	5	6	7	8
90 min session	Photolithography Dr Jing-Hong (Mike) Pai	Cleanroom Q2-30	A	B	C	D	E	F	G	H
90 min session	Etching Dr Donghoon Chang	Cleanroom Q2-30	B	A	D	C	F	E	H	G
90 min session	Design Simon Doe & Mark Cherrill	MM2-04	G	H	A	B	C	D	E	F
90 min session	3D printing David Chan & Dr Kamil Zuber	MM Industry 4.0 Testlab	F	C	H	E	B	G	D	A
90 min session	PDMS devices Dr Mona Elsemary & Farzaneh Mohammadbeigi	MM2-11	E	F	G	H	A	B	C	D
45 min session	Microelectrodes Igor Switala & Dr Maryam Khaksar	Q2-11	D	E	F	G	H	A	B	C
45 min session	Electrical integration Said Al-Sarawi									
45 min session	Fabry-Perot Pressure sensor Peter Cook	Q1-14	C	D	E	F	G	H	A	B
45 min session	Optical communications Dr Nick Riesen									
90 min session	SEM simulation & inspection Dr Jason Gascooke, Clare Kelly & Son Nguyen	MM2-10	H	G	B	A	D	C	F	E



ANFF-SA Microengineering Winter School industry tours

TOUR - TUESDAY JULY 14 FROM 4.10PM TO 4.55PM

Tour 1 UniSA Future Industries Institute tour



UniSA's Future Industries Institute focuses on building knowledge and capacity in core future industries across four key strands: minerals and resources engineering, energy and advanced manufacturing, environmental science and engineering, biomaterials engineering and nanomedicine.

Presented by: A/Prof. Colin Hall, Prof. David Lancaster and Euan Smith, UniSA

TOURS - WEDNESDAY JULY 14 FROM 12.15PM TO 1.15PM

Tour 1 Rapier - 9A Park Way, Mawson Lakes



Rapier offer comprehensive Electronics Manufacturing Services (EMS) to cover all of your product needs. From Printed Circuit Board Assembly (PCBA) to Printed Circuit Board (PCB) supply and part procurement for prototyping and product development, volume production for consumer use items right through to critical use, space electronics, no job is too big or too small.

Presented by: Daniel Mason, Operations Manager and Business Development

Tour 2 Tindo Solar - 5/6-8 Second Avenue, Mawson Lakes



Tindo designs and manufactures technologically advanced solar panels in Australia, for Australia and the world. Tindo Solar is a wholly Australian owned and operated company, founded in 2011, focused on increasing manufacturing output and creating Australian jobs in the advanced manufacturing sector.

Presented by: Robert Sporne, General Manager

TOURS - THURSDAY JULY 15 FROM 12.15PM TO 1.15PM

Tour 1 CODAN - 2 Second Ave, Mawson Lakes



Codan provides technology that has your back in the harshest environments on earth. Whether it's for communications, safety, security or productivity, Codan are relied upon by humanitarian organisations, mining companies, security and military groups, governments and adventurers in every corner of the globe.

Presented by: Nino Caporrella, Radio Communications Product Manager, Group Operations

Tour 2 Tindo Solar - 5/6-8 Second Avenue, Mawson Lakes



Rapier offer comprehensive Electronics Manufacturing Services (EMS) to cover all of your product needs. From Printed Circuit Board Assembly (PCBA) to Printed Circuit Board (PCB) supply and part procurement for prototyping and product development, volume production for consumer use items right through to critical use, space electronics, no job is too big or too small.

Presented by: Daniel Mason, Operations Manager and Business Development