

## Transcript



Title: Swinburne International Webinar Series: Swinburne Science  
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Year: 2020

Audio/video for this transcript available from: <http://commons.swinburne.edu.au>

VENUS LIAO: Good afternoon, everyone. My name is Venus Liao. Welcome to Swinburne webinar series on a Friday afternoon. I'm the regional recruitment manager from Swinburne University. I look after Australia Onshore and New Zealand region. I hope you are all well and healthy.

On your right-hand side are the panellists for today's webinar, Dr. Daniel Eldridge, lecturer in chemistry, and Dr. Brenton Hall, department chair for physics and astronomy. And Mr. Mahdi Shariatian, the International Recruitment Manager from the Faculty of Science, Engineering and Technology at Swinburne University.

Thank you for joining us today for virtual training on Swinburne Science. This is part of the Swinburne webinar series I'm running from the month of May to July. Today we'll be hearing from Dr. Daniel and Dr. Brenton, talking about study science at Swinburne, and how this discipline has been impacted by COVID-19, how we, as a university, preparing our students, dealing with the situation and future scenarios. We will also be talking about the projection on emerging jobs in this field.

If you have any questions during the presentation, please leave your question in the Q&A down below. At the end of the webinar, we will leave five to 10 minutes to go through your questions together. If we can't cover your questions today, please feel free to contact Mahdi, or your regional recruitment managers from Swinburne University. We will be sharing today's presentation by email, all the participants after today's webinar.

I'd like to introduce today's presenters, Dr. Daniel, and Dr. Brenton Hall from Swinburne University. Thank you, Daniel.

DR. DANIEL ELDRIDGE: Thanks, Venus. Thanks very much. Hello, everyone. Good afternoon, or evening, or morning wherever you may be. My name is Daniel, and I'm going to talk to you about science at Swinburne, of course, and why prospective students might want to come and study science, everything great about it, and why they might choose Swinburne for the place to do that.

So first of all, what draws us to science in the first place? Most people studying science, it's a labour of love. It's something they've chosen because of an interest. We are usually that kid in class who, when we were younger, learnt about something new, and exciting, and then we still had that burning question-- but why? We want to know more, and we want to know how.

And ultimately, scientists, we're the group who just simply never learned how to stop asking that question. We've always had that curiosity to know more about how the world works and what we can do with it to make it a better place. Some of us, very interested in this on the enormous scale. So

we want to look out there and understand how it all began, or how parts of our universe and our world work.

And then we've got people right down at the other end of the spectrum. We're more interested in things on the tiny level, so wondering how atoms, and molecules, or little microorganisms might work. Of course this is all over the news at the moment, where everywhere in the world is trying to understand this COVID-19 phenomenon-- about what's caused it, about what we can do to protect ourselves, what we can do to prevent it.

So our interests in these sciences, they range greatly across different parts of our universe. Now why might students be interested in taking up science at the moment? Well, like I said, it is a labour a labour of love. There is obviously no greater time for there to be a broad interest in science. Everyone is talking about this latest problem, the COVID-19 situation. And in fact, we've got world leaders and policymakers immediately turning to scientists for their knowledge and expertise on what's going on, what we can expect, and how we might be able to combat this problem going forwards.

But of course, once we get through all of this-- and we will get through all of this-- life will then return back to where it was, and we'll have these other enormous challenges to face. We're going to have to sort out that global warming problem. People are still hungry in the world. Some of you want a better smartphone. Science is going to help contribute answers to all of these different problems.

So lots of people interested in taking this on for a variety of different reasons. What makes studying science great at Swinburne? I can answer this firsthand-- I actually came and studied science here, myself, many moons ago.

One of the things I loved about it, you've got considerably smaller classes than some institutions. And that means you really do get more of a hands-on approach. You'll get to know the staff that are teaching you. You'll get to have interactions with them on a relatively regular basis, particularly as you go through. So you'll learn who they are, or where their interests are, and they'll be able to help you along the way through your studying journey.

You're also not likely to be sitting in too many classes where you've got 500 or 1,000 people in a subject. A lot of our first-year subjects start, maybe, in the hundreds-- in the sort of lower hundreds. By the time you get to some of your final year units, much, much smaller than that. Again, great opportunities to interact with one another and with your academic staff.

It also makes it much easier to form social and friendship groups. I'm still friends with a lot of people I graduated from my Bachelor of Science with, all these years later. So I really love that more intimate environment.

The other great thing about that smaller, intimate environment, Swinburne, for as long as I've known them, have really prided themselves on the hands-on experience that we give to our students. So if you're talking to students thinking of coming to join us, again, having the ability to get into the labs, and not to see someone use an advanced piece of equipment, or a microscope, or look through a window at a several thousand dollars piece of instrument.

We're not interested in that. We want students to learn to use these pieces of equipment. To go in, try them for themselves, figure out how it works. And that way, when they go out into the world and

try to get their employment, start their career, they can put their hand on their heart and say, I don't just know what that is, I've used it. I've tried it. I know what it can do. Yet this is an amazing skill set to have. We think it is one of the things that really helps set our science graduates apart, that hands-on know-how.

Other great benefits we have for students coming to us, our campus is very easily accessible. You can see I've got a picture there of the train coming in. We have a train station situated almost literally in the center of our campus, which means there's a very large part of Melbourne that people can live in where they can very easily get to our campus. There is also on-campus accommodation available-- lots of students taking advantage of that. And there are also quite a few rental properties in the area. So students manage to find getting to Swinburne to be a very easy thing to do.

In terms of academic rankings, our science courses are very highly recognized. We are ranked in the world rankings as being one of the top 200 universities, that's in the entire world, for science. So again, students get that great experience when they come here, and it's not just for their undergraduate program, either. We also have strength in quite a variety of different scientific research areas, so students who study science, often very interested in going on to study the unknown.

Again, we talked about that-- we are usually that kid who never quite stopped asking why. Well this is their chance to get answers to some of those questions. We'll talk more about what some of those programs might look like a little later on.

As for our learning and teaching approach, I'm going to hand over to Brenton, who can chat a little bit more about that. Brenton?

DR. BRENTON HALL: Thanks, Daniel. If you could advance the slide-- fantastic. Hi, everyone. Thank you all for joining us. It's exciting to be able to reach out to so many people and tell you a little bit about the approach that we take to learning and teaching at Swinburne. Daniel's already mentioned some of the fantastic experiences you get as a student, that's kind of encapsulated inside our sort of transforming STEM strategy.

One of the things that that allows us to do is really focus our students on making them digitally literate learners and preparing them for a future in the workforce. One approach that we have at Swinburne, because we recognize that our students don't necessarily fit the profile of being fresh out of high school, we have people who have career changes, first in family learners, full-time carers, and part time students. And almost all of our students, and especially the international ones, are going to be juggling working while learning.

And so this really requires us that we take a student centred approach where we really try to deliver, and fit our teaching into the student's needs. And I think that's a real unique kind of cultural approach that Swinburne has.

Under that umbrella of transforming STEM, the university has made a series of very large financial commitments to transform STEM. One of these was the move to a new learning management system in 2019 called Canvas, which has given all of our teaching staff amazing tools for online engagement. And little did we know that would become so important when we had to quickly pivot, within one week, to being, delivering face to face, to delivering completely online due to the COVID-19 pandemic.

But these digital tools still allow us to engage with our students, allow the students to engage with each other, keeping them connected, and keeping them learning, which is great to see. And it's given such a great uplift to all of our units as well.

Some of the other tools that we've invested in Echo ALP, which allows us to be delivering-- you're basically, you're walking around with a studio inside your pocket. I think I saw a wonderful meme a little while ago telling us-- it had an old crusty professor, I'm not quite there yet-- stating that broadcasting on YouTube would never be a career. And now we all seem to be doing it, so-- and that's the platform that helps us.

We also have, here, a little bit on professional purpose and authentic experience. These are two other kind of strategy approaches that we have, that we embed within the whole degree. So you'll see an image there of some of our fantastic first-year physics students. So we take them out to Mount Burnett and they do some site visits with these telescopes, and learn to drive them, and operate them.

And it's a great way of building that camaraderie amongst the students, and really allowing them to actualize their passion. And then how we connect them to the world of work is through that professional purpose program. Can I get you to jump one slide forward? Thank you, Daniel.

So I also want to talk a little bit about a cultural piece. So one of the really fantastic aspects of coming to Swinburne-- and I can't overstate this enough-- is the supportive and friendly staff that we have, particularly, I'm a department chair, so I get to work with a lot of my staff and they are phenomenal. And they will go above and beyond to meet the student's needs. And nowhere has this been seen in this pivot to delivering online and through COVID-19.

So this speaks to the culture of Swinburne. We want to do outstanding work. We do do outstanding work. But we do this with care and compassion, and that's a culture that we imbue in our students as well. So I kind of call it humility and hard work, a magical mixture.

And so we have some support services, of course, for when we're on campus. And we will be back onto campus, partially, in semester two-- we're moving towards that. And we have a sort of drop-in centre that students can get help. But we have a huge range of online resources as well, that have been developed within the School of Science-- how-to videos-- so that you can access help whenever you need to. And that's the kind of world that we live in now.

So next slide. Thanks, Daniel. So one other fantastic thing that the university has done, and I almost wish that this was something that I had access to when I went through, is called the Swinburne Advantage. And it's the real connection that Swinburne makes with industry. So Swinburne has a proud partnership of 30 years plus of being an industry kind of embedded university.

And so there are a whole range of these activities which allow students to find themselves inside the workplace. The professional degree is probably the one I have the most interaction with. I'm a supervisor of several professional placement students where they get to spend the sort of third year of their degree embedded in industry, earning a fantastic wage, tax-free. And picking up such great, transferable skills, and seeing how their education fits into the world of work.

And then they come back and join us, and allow us to have that connection back in industry as well. They are role models for the students that don't go on to professional placement, but there are lots

of other opportunities for students. And once they see just what that opportunity brings, the students run to that. And I think the university works really hard to make that happen.

So that's something that I know international students can get access into as well, into the professional degree. And even if they come into the regular Bachelor of Science, they can also transfer into the degree while in country. So that's a really sort of unique, I guess, aspect to studying at Swinburne, and it's something which is really great to see.

I think I've got one more, which is on the career outcomes. So as a physicist, I'm often asked, at open days, from eager parents, where are the physics careers? So my answer to them is that, when you study physics, and science, it's not so much about an A to B pathway.

So it's a sort of A to everywhere because the careers in physics are wide and varied. Because it's really that sort of analytical skill set, and computational, and digital literacy built with an imbuable tenacity to tackle hard things and the confidence that it brings. And all of that's being driven because you're able to take the passion that people have for inquiry in physics and mould those skill sets.

But of course, they always want to hear OK, so but now where do they go? So we have quite a variety of places sort of listed up here. It's not exhaustive, of course. And if you really want to go to any great resources, the AIP have a wonderful, exhaustive list of those. But big recruiters at the moment are anyone in data science and data analytics with traditionally pilfered physics students, and now we also find that they're building degrees entirely for that range. So that still is probably one of our biggest employers.

And also in finance as well. We do have some students who go on to pursue higher research because at Swinburne, we have about 100 undergraduate students, about 100 research and academic staff, and about 100 PhD students. So that pathway to sort of further research in academia as well, is quite strong for a lot of our students. And we have some connections directly with defence, here in Melbourne, too. So in fact, we have a few professional placement students who are out there working in the defence science area.

R&D and technical sales are a strong pull as well, as is within government and policy. As you can imagine, there's quite a few people who are being recruited into government now, to give the correct kind of information for governments to make the good decisions they need to. And hopefully we'll see that continue.

DR. DANIEL ELDRIDGE: And just adding to some of the things that Brenton has just said, I was talking about the work placement year. So I was lucky enough to take advantage of that at Swinburne when I was here. And I can say, yeah, it was just an amazing experience, that one year of actually being an employee while I was still a student. I was treated like someone who worked in the company. I had all the responsibilities, learnt so much, as Brenton said.

Also, as someone still just doing my university studies, they were paying me more money than I'd ever seen in my life. So yeah, it was great financially, and from experience point of view. And just completely changed my perspective when I came back to uni. You just have a very renewed focus.

And Brenton's also talked a lot about the different careers we have here. There are some of the cliché ones that are definitely listed. The pharmaceutical industry takes a lot of our students. I can imagine they might be particularly interested in scientists at the moment, again, with the current world issues that we're facing.

But then after that, we see our students go into so many different directions. And this is typical across the sciences. You can see there, we also have education and academia. People like Brenton and I decided it was so good that we'd literally never leave.

Even some of my friends have even specifically been targeted, because they're science graduates, for non-science careers. A good friend of mine stepped out of his science degree and into a job in IT. And I remember asking his boss why he did that and he said, well, I like the way scientists think and that's why I tapped him on the shoulder. So yeah, lots of possibilities in terms of those career outcomes.

So putting this all together. If you are looking at a Bachelor of Science at Swinburne, well the way we would do that is you would come, you'd learn to be a scientist. You'd learn some of these key skills. Make sure you have got some maths, and physics, and biology, and chemistry behind you. Things that make you a good scientist.

You would then choose one, or even two majors. We allow students to combine and do two majors at once. Our major areas of study involve applied mathematics, physics, chemistry, like myself, or biochemistry and biotechnology for those who want to know the chemistry of what goes on inside living organisms. Those who want to understand the way viruses, and genes, and proteins work-- work directly on this world problem at the moment.

And environmental science, where we actually-- we really push a difference here, where our environmental science is about taking our science, taking our biology, chemistry, and physics, and then saying all right, how can we use that knowledge to better our environment? How we can fight these ongoing world problems like global warming, or hunger, or the water shortages? All of these issues, we try and use science in order to better those situations.

And lastly, Brenton and I have alluded to this, a lot of our students, they start this study because they are curious. They want to know more. It's therefore no surprise that around a third of our students are interested not just in their undergraduate degree, but going on into postgraduate options where they can do research degrees, either a master's by research or PhD program. We offer both of these opportunities.

We have an amazing host of different areas where research is conducted. In the chemistry department, we're working on all kinds of new materials, trying to develop new solar energy resources, or make new medical implants that are compatible with our bodies, treat wastewater in our environment. This list could go on and on. I'm sure Brenton's got some great examples from the physics and astronomy area as well-- Brenton?

DR. BRENTON HALL: I quite like the brand new Gravitational Wave Astronomy Centre of Excellence that we here, like I had at Swinburne. So they do some fantastic work in this brand new area, a brand new tool to look at the universe. It's one thing that physicists often do, is they end up building the tools for other sciences. I was reading about some of the fantastic work in the mapping of COVID, of the molecules [INAUDIBLE] to understand the proteins. And that's really down to the advances that we've had in X-ray science with the synchrotrons-- we've got one of those, like right here in Melbourne-- and how that's able to speed up the understanding of viruses. So physicists are routinely building better tools. They're unlocking new technology.

DR. DANIEL ELDRIDGE: And it's great to see that coming together. Just yesterday, I had a conversation with one of our starting research students who looking at using tools like that in order

to quite literally look at how we can better target drugs so that they can attack molecules like these. Looking to attack the proteins that make up these COVID-19 entities and yeah, try and get through this problem sooner.

Anyway, we'll leave it there for now, see if you've got any questions. Just got a summary there of the different majors that students might be interested in asking you more about, and some general points about what our course looks like, and what students can do if they want more. Thanks, everyone.

VENUS LIAO: Thank you, Daniel and Brenton for a wonderful presentation. We now open up for questions. There hasn't been any questions coming in, but I do have one, perhaps for Brenton. You did mention in the career outcomes slide, and you did say that AIP-- can you tell us what AIP stands for?

DR. BRENTON HALL: Sorry. I was referring to the American Institute of Physics website, which has a fantastic resource on career outcomes, and some data I guess you could have a look at there, for where students go.

VENUS LIAO: Thank you.

DR. BRENTON HALL: They've done quite a comprehensive, sort of hundred-person survey, where they asked those people about their careers-- and the careers are vast, like 100 different careers-- and what took them on that journey.

VENUS LIAO: Wonderful insight. And perhaps either one of you can share with us about what labs at Swinburne does science student use?

DR. DANIEL ELDRIDGE: Brenton, would you like to go first?

DR. BRENTON HALL: So I can talk directly about the physics and the physics students. So we have a couple of undergraduate labs that students use. But one of the fantastic things that we've got with our program-- and this comes down to the critical mass research strength that we have-- is that we've got programs where students find themselves in research centres. So we have that built, specifically, into our degree within first-year, second-year, and third-year.

And often what happens is that once students have done that formally, through a unit, they'll also continue to work alongside those researchers as sort of extracurricular activities, which are actually rewarded because we have a wonderful program here called the Emerging Leaders Program where students can submit, sort of, the evidence of that work. And that's recognized on their academic transcript, so it kind of makes them stand out as sort of leaders in the area.

And a lot of the time, the students just absolutely love to be involved in the sort of cutting edge research that's going on. You don't get to-- you usually don't get to run a nanofabrication facility in undergraduate, but you can here.

VENUS LIAO: And I know there is a MRI machine in one of the labs at Swinburne as well. Is that for science students, or that's for different discipline?

DR. DANIEL ELDRIDGE: That tends to be used more by the biomedical science and neurophysiology group. But again, for the sciences, there's too many different instruments to list for all the different

sciences that they use. We've got instrumentation laboratories specifically set out for all kinds of analytical chemistry and biochemistry, for cutting edge biotechnology research techniques.

This list really does go on. And again, in the early parts of their undergraduate, it's about learning to use these things. But again, one of the favourite things we have in our program is the opportunity for these students to use them, to learn how to use them throughout their degree.

And then as they get towards the end, even in their undergraduate, we start getting them involved in research experiences. So they get to explore an area of interest, and then go and do some work using this high-end equipment to help them answer questions that they're genuinely interested in. It's just an amazing experience.

VENUS LIAO: Wonderful. We do have a question coming in asking, "please explain more on Swinburne Advantage, the 12th month of professional placement.

DR. BRENTON HALL: Sure, I can take that one. So Swinburne essentially has this program for students who enroll in the professional degree. And they are placed -- so Swinburne has a crack team of people who spend all their time connecting with industry, and lining up these 12-month placements which students apply for, and they interview for.

And then the company selects them and then they go and work in the company, not doing any academic units while they're working with the company. And they get paid for this. And they basically are able to bring that experience back into the program, into the undergraduate program, and they come back changed. It's an absolutely life transforming event for them.

They do have a continual connection with the university during that time, so they have academic supervisors as well as supervisors in the workplace. And so we visit them, we see them, we connect with industry and support them on their journey. And it's something which just radically transforms how they view their education and their approach. It's this kind of professional purpose that we talk about, where you take someone's passion and then you drive them towards what they want to do. So it's their thing which motivates them and keeps them motivated for the when times get tough in studies.

DR. DANIEL ELDRIDGE: And I guess, again, just adding to that. I went through this process firsthand, some time ago, myself, and it was just wonderful. You sign up for the process and the university helps connect you with a few different companies. I got to go out and interview it a couple of places, including Australia's-- one of Australia's premier research institutes, the CSIRO, Owens-Illinois Glass Laboratories, and that's where I ended up doing my year's work.

And then as I mentioned earlier, for that year, I wasn't some student who was there as part of the team. I was an employee. I had a place on the organizational chart. I had duties and responsibilities. I made friends and shared lunches together, learned so much about the way-- like a chemical laboratory works in the workplace. Just everything that came with the experience. It really was just having a job for a year, being able to take that experience, and then use that to help finish my degree.

And it then means that when you get to the end of your degree, you're not a graduate waiting to be to get that experience so that you've got experience to apply for the job. You can already say, I have experience in industry. I've worked in a team and I can now continue to do that. It's just such a good opportunity. I'd recommend it to anyone who has it.



VENUS LIAO: Yeah, wonderful. Actually, a lot of students and agents think about, or heard of professional placement or internship, they might be thinking, you know, are they just doing filing, or are they just buying coffees? But actually, no. At Swinburne, our university provides our students a real work experience, and they've been given a hands-on task. They need to have budgets to work on, they have campaign to run, so they are doing real work.

So I just like how Daniel was describing his experience, taking the professional placements part of the degree.

DR. DANIEL ELDRIDGE: I got to use equipment and things I'd only dreamed of.

[LAUGHTER]

Yeah, it was really good.

VENUS LIAO: Yeah. That's wonderful. All right. We have more questions coming in. Thank you. "Is it available for master's students as well, and in what year it can be taken? Can you please share a link where we can find more information?"

MAHDI SHARIATIAN: I'm happy to take care of this. I've already sent a link, and I think it's already been received. So this professional year is not available for masters, but other sorts of industry collaboration is available for students in a shorter term. Well, it's considering that master's students are with us only for two years.

I just want to add something else about the professional year. For international students who are studying in Australia, who are in Australia and applying through [INAUDIBLE] complete an Australian year 12, they can apply directly to start the professional year.

For those international students who come with overseas degrees, and start their degree, they can transfer into a professional year. There is a process, they have to go through a bit of a selection criteria and satisfy a few requirements. And once that is, they can apply for it, and they can transfer into the professional year and complete this amazing experience-- and pretty unique in the whole industry. Thanks, Venus.

VENUS LIAO: Thank you, Mahdi. And we've got a question also asking, "because the professional degree for the undergraduate level is currently available for Australian students, that includes international students completed high schools within the country. And for those coming in through a standard Bachelor Degree, can we know what are the criteria for these students to transfer from a standard Bachelor Degree to professional degree?"

DR. DANIEL ELDRIDGE: Madhi, do you want to?

MAHDI SHARIATIAN: Yeah. It varies from course to course. But I think the best starting point is to speak with the course advisor about how to transfer. That would be the first. And then after that, speak to your course director about transferring into the professional year. Obviously, the students need to be high achieving students, need to perform well.

Because first thing is, it's harder to get into the professional year than the normal version of the degree. But it's different to different-- it's course by course. But best to start speaking the course

advisor as soon as they start their degree. And then speak with the course director, they'll inform them about the requirements.

VENUS LIAO: Thank you.

DR. BRENTON HALL: Yeah. There's a higher, I guess, HR requirement to get into that degree. And there's also so a minimum GPA requirement that you need to maintain while in the degree.

VENUS LIAO: Yes. So for that information, the HR score required for professional degree from Swinburne is HR 80, and 85 for Engineering Honours Degree. And just to share more information on that as well, we do have students can, through a Standard Bachelor Degree in Bachelor of Business, and had a chance to transfer to a Bachelor of Business professional degree by meeting all the criteria.

So it is possible. If you or your student have joined us from a standard Bachelor Degree but end up transferring to a professional degree and that student was from Sri Lanka, and she was working at Bosch Australia assisting with Creative Marketing Department as well.

So we're happy to share more information on that post-webinar. And that also means we're hitting our 2:30 mark, and that will bring us to the end of the webinar for today. So I just wanted to thank you, Daniel and Brenton, for your presentation on Swinburne Science. And thank you to all the participants joining us around the world today.

The presentation, again, will be emailed to you after the webinar. And we would like you to join us at our next webinar on next Wednesday, 3rd of June, on Business Management and Digital Media. The invitation will be sent out to you all today. Hopefully to see you next Wednesday at 2 PM.

Thank you again, and have a nice day, and nice weekend, everyone. Take care. Goodbye.

[END OF TRANSCRIPT]