Revolutionising Victorian manufacturing to create the industry, workforce and leaders of the future.

**Linking talent and innovation to transform manufacturing**

Monash Smart Manufacturing Hub (MSMH) is more than a building. It’s more than an idea or a collection of programs. It’s your complete innovation ecosystem.

From testing a new idea to embracing end-to-end automation, we get to know your needs to support your innovation strategy and enable you to realise your R&D goals.

To do this, we give you access to state-of-the-art labs, world-class academics, funding grants and Australia’s brightest STEM students.

Ready to expand your intrapreneurial or entrepreneurial ventures? With co-location, we’ve got the space – plus the tools, tech and talent–you’ve been searching for.
INDUSTRY, STUDENTS AND WORLD-CLASS RESEARCHERS WILL CONVERGE TO TRANSFORM MANUFACTURING AND GENERATE A PIPELINE OF:

**New businesses and entrepreneurs**
Entrepreneurial workforce translating ideas to products from start-up to employer

**Transformed industry**
- Competitive manufacturing
- Future-proof jobs
- Economic growth

**Future workplace**
- Transformative skills
- Innovators
- Change leaders

**Monash Smart Manufacturing Hub**
YOUR PARTNERSHIP WITH MONASH

WHAT’S ON OFFER AT MONASH

1 INDUSTRY-FOCUSED DOCTORAL PROGRAM
Our program is industry-relevant and industry-paced. As your needs change, so too will the candidate’s focus.

2 CROSS-FACULTY COLLABORATION
Discover and apply insights from leading academics in engineering, technology, science, pharmacy and beyond.

3 YOUR RECRUITMENT PIPELINE
Get early access to the brightest students – and train them to become a perfect fit for your business.
MSMH is at the heart of the Monash National Employment and Innovation Cluster – Victoria’s largest employment hub outside the Melbourne CBD. Bolstered by advanced education, health and research facilities, the cluster supports:

- **95,000** jobs in manufacturing, health and technology
- **14,000** businesses and new enterprises
- **$9.4B** annual contribution to the Victorian economy
- **16,000** STEM graduates for the future

**LOW-RISK, HIGH-REWARD INVESTMENT**
Leverage smart technology to simulate costs and solutions – before investing in infrastructure.

**NEW NETWORKS**
MSMH is a hive of activity where academia, industry and students come together to build the future of manufacturing.
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Together, we help you:

- Refine and streamline your processes
- Spur innovation and upskill your staff
- Tackle your challenges — from every angle — with researchers from across our faculties
- Connect your manufacturing and built environments to reduce waste and amplify outputs
- Design advanced simulations to test and optimise superior solutions.
JOIN US ON CAMPUS TO ACCESS PURPOSE-BUILT INFRASTRUCTURE, LIKE OUR MAKERSPACE FABRICATION FACILITY AND CO-LAB COLLABORATION SPACE, AND START ACHIEVING YOUR R&D GOALS SOONER.
PARTNER WITH MONASH TO EMBRACE THE FUTURE OF MANUFACTURING

In smart manufacturing, the physical and digital worlds aren’t merely connected. They’re entwined as one, to ignite innovation and fuel your business into the future.

Our co-creation ecosystem connects you with world-class researchers and students with a flair for problem solving. Together, we’ll solve your manufacturing challenges and design state-of-the-art solutions.

We’ll help you lead the way in sustainable manufacturing with virtual prototypes and efficiency excellence, and strengthen your local capabilities – so you can support your customers with confidence.

Manufacturing isn’t what it used to be. It’s integrated. It’s intelligent. And it’s what you make it. Ready to explore the possibilities?
A mutually beneficial partnership
At the MSMH, our talent is your talent.
You’ll benefit from our creativity, processes and research labs. Our students will gain the hands-on experience they need to excel as professionals in the workforce.
Then, once you’ve worked with our students, we’re confident you’ll want to bring them into your team for the long-term. It’s your tailored recruitment pipeline.
Whether it’s through our industry doctoral program or embedded internships, we provide you with a low-risk environment to engage the next generation of engineers, scientists and technologists.
ACCESS OUR INDUSTRY DOCTORAL PROGRAM TO SPUR YOUR INNOVATION

What if a PhD could prepare engineers, scientists and technologists for what’s next and bolster your business? That’s exactly what Monash’s new industry doctoral program will deliver. By bringing a doctoral candidate into your business, you can catalyse research and innovation – and find top talent in the process.

From testing ideas to transforming industry

Whereas a conventional PhD might build towards a thesis after four years, this new program moves at the pace and flow of your business.

Our candidates will unearth and present you with new insights every few months – so you can deploy and scale solutions at speed.

And if you’re looking to keep your employees engaged and committed to your business, you can enrol them in our industry doctoral program to foster their development, onsite at work.

Eager to embed qualified and driven people into your business? Keen to access all the state-of-the-art facilities, tools, software and talent that Monash has to offer? Let’s spur innovation together.
How the industry doctoral program unfolds

Let us know how we can help
Perhaps you’re updating your production line, expanding into new materials or want to learn more about your current processes. Whether it’s a challenge that needs solving or an opportunity to seize, let’s talk.

We’ll develop a detailed scope
Produced in partnership with an academic supervisor, your project scope will outline expectations and timeframes. So you know exactly how the candidate will work to discover innovations and contribute towards your business.

The candidate builds a portfolio of solutions
As the program progresses, the candidate builds a portfolio of work that brings immediate benefits to your business. Through technical business cases, pilot trials or full-blown implementation campaigns, they continually contribute value to your organisation.

Final innovation report and beyond
At the end of the program, the candidate details what they’ve achieved and how it directly bolsters your business. Then, you have an employee, or a potential one, with a deep understanding of your business and proven technical training – to propel your innovation strategy even further.
SOLUTIONS TO YOUR CHALLENGES
BY OUR STUDENTS

Want to automate your machines and production lines? Looking to invest in R&D but don’t have capacity onsite? Through our Embedded Co-op Program, we connect you with industrious students, advanced technology and leading academics. The result? Innovative commercial solutions for your business.

Access world-class talent and tools

With our Embedded Co-op Program, Monash’s extensive talent pool and infrastructure come together to design tailor-made solutions for your business. So you can test and optimise ideas – without pressing pause on your production line.

Our students are eager to inject their talent for problem solving to refine your processes in low-risk innovation spaces – like our Digital Twin Labs and Makerspace.

They’re unconstrained by legacy thinking yet remain guided by our experienced academics to solve your challenges. Our program is tailored to expedite your journey towards tech- and innovation-led operations.

Got a **challenge** to solve? An opportunity to seize? Together, we’ll develop a project scope with clear expectations and timeframes so you know what’s ahead – and what’ll you gain.

We’ll assemble a talented team of students and a project supervisor to liaise and **collaborate** with your business.
SO WHETHER YOU’RE GETTING STARTED WITH DATA-DRIVEN ANALYSIS, LOOKING TO AUTOMATE PROCESSES OR WANT TO DEPLOY ADVANCED MACHINE LEARNING, WE’LL HELP YOU REFINE AND INTEGRATE YOUR SOLUTIONS.

Our students will explore the project from every angle. They’re brimming with energy to unpack the challenge, experiment with new ideas and design optimal solutions.

We’ll then present our recommended findings. You can then decide if the solution is worth scaling up or even employ our graduating students on an ongoing basis.
At times, R&D can be resource heavy and risky. Plus, the outcomes for your business aren’t always guaranteed.

**Enter our state-of-the-art Digital Twin Labs**

One focused on manufacturing, drawing data from a robotic manufacturing line. And another exploring construction and maintenance, sourcing insights across the MSMH built environment.

We’ll replicate your operations in advanced simulations. So before committing to any physical changes, you’ll already know the benefits and efficiency boosts you’ll gain.

**Simulate, integrate and scale up**

We’ll create a digital mirror of your production environment to get to know your challenges from every angle, and transform your processes to be more productive, efficient and safe. Then, through small-scale tests we’ll examine and enhance each solution in the physical world. And if they’re a success?

Ramp up and integrate each refinement across your operations. You’ll gain a dynamic package of insights to elevate your processes, strengthen your competitive edge — and find issues before they become issues.

**WITH OUR DIGITAL TWIN LABS, IT’S ALL CONNECTED. AND IT ALL BUILDS TOWARDS OPTIMISING YOUR OPERATIONS.**
GAIN INSIGHTS AND RESOLVE ISSUES BEFORE INVESTING

Our Manufacturing Digital Twin Lab is your ticket to automated machine-machine collaboration and streamlined human-machine interactions.

We’ll run complex simulations and develop virtual commissioning. So you can see the benefits, risks and costs before investing in physical infrastructure and installations.

Our Built Digital Twin Lab monitors and predicts building performance and interactions with the environment. Using the Internet of Things, we track data across a network of building sensors to assess people, energy and heat flow through the facility.

We’ll equip you with insights to improve staff wellbeing, thermal efficiencies energy savings, safety, sustainability and user experiences – both pre- and post construction.
HOW A MONASH BREAKTHROUGH BECAME THE FUTURE OF WATER FILTRATION

Waste water can contain harmful pollutants which need to be removed before it can be safely used again. Traditionally, it’s passed through polymer membranes to remove these pollutants.

But the entire process is inefficient, expensive and too often unsafe.

Monash Professor Mainak Majumder has been studying nanofiltration membranes which are more energy efficient, more durable – and better at filtering pollutants.

In 2016 he developed his first proof of concept using a new high-speed, layer-by-layer process in a Monash research lab.

Mainak refined the technology, collaborated with PhD students and received on-campus marketing support to promote the technology throughout industry.

The NematiQ team is moving to demonstration level to showcase the technology’s potential with water utilities and manufacturers.

Mainak continues to expand graphene’s potential to reshape industry, exploring next-generation challenges like desalination and removing heavy metals. He is supported by the Australian Research Council’s Hub on Advanced Manufacturing with 2D Materials (AM2D).
Industrial 3D printers harness high-powered lasers to selectively melt powdered metal, building components layer upon layer.

But defects can form as each layer is melted. And often, these defects, like voids and pores, aren’t detected until it’s too late to correct them.

Marten Jurg, a former Monash PhD candidate, developed sensors powered by machine learning to detect these defects in real time.

After refining his idea and algorithms, Marten joined The Generator, Monash’s accelerator program that lifts ideas out of the lab and provides a framework to grow start-ups into thriving businesses.

Sensing long-term potential, Monash Investment Holdings secured a significant stake in Marten’s business, Additive Assurance. This meant Marten had the capital he needed to grow the team and win international contracts – recently partnering with Volkswagen.
Lab to industry: The Zythologist

FROM A PHD TO A CENTRE FOR AUSTRALIAN BREWING INNOVATION

Through nano-brewing, beer can be broken down, put under the microscope and examined. With over 300 chemical compounds shaping a beer’s flavour and quality, breweries can use the analysis to refine and optimise their brewing process.

Monash’s BrewLab is Australia’s first student-led nano-brewery, founded by Monash PhD candidates Daniel Rojas Sanchez and Gina Pacheco Arredondo. Together with Monash alum Shivam Tandon, they created The Zythologist – a science-based brewery and an analytical testing consultancy for craft breweries.

The Zythologist aims to be the centre of beer production, research, innovation and education in Australia. Embedded on campus, the team enjoys easy access to Monash’s world-class facilities, including the new ChemBio Makerspace.

Beyond brewing, The Zythologist will offer testing and analytical services to industry partners, connecting breweries with Monash’s research expertise, education and infrastructure.
When trucks are on the road transporting goods day after day, every gram and every millimetre matters. So to reduce trailer weight, MaxiTRANS explored building trailers using high-strength steel. But the trailers experienced stress on the road and showed signs of cracking. Led by Associate Professor Wenyi Yan, Monash students investigated the material further. And in another side-project, a final year Monash student worked with MaxiTRANS to measure real-world road conditions by placing accelerometers on active trailers.

Armed with reliable data, the students used finite element analysis to gain a visual representation of stress levels across the trailer. MaxiTRANS received a rich package of insights to better understand the limitations of high-strength steel in fatigue situations. And the business continues to support Monash students in their transition to industry, pairing them with experienced technical leads who offer mentorship and guidance.
EAGER TO IGNITE INNOVATION AND FUEL YOUR BUSINESS INTO THE FUTURE? LET'S TALK.

Shankar Cumarasamy
Hub Business Development
Email: shankar.cumarasamy@monash.edu
T: +61 3 9905 8695
M: +61 427 924 529

Visit the website:

The Monash Smart Manufacturing Hub acknowledges its supporters and affiliates from across the University:
- Faculty of Engineering
- Faculty of Information Technology
- Faculty of Pharmacy and Pharmaceutical Sciences
- Faculty of Science
- The Generator
eSolutions

We recognise that the Monash Smart Manufacturing Hub is located on the unceded lands of the people of the Kulin nations, and pay our respects to their elders, past, present and emerging.

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