WHAT IS MECHATRONICS ENGINEERING?

Mechatronics is a multidisciplinary field of engineering that combines mechanical engineering, computing, electronics and control theory.

It is at the forefront of the development of smart-products and intelligent devices. Mechatronics engineers work to improve the performance, features and functionality of products and systems. As a mechatronics engineer you could design aircraft avionics for autonomous aircraft, produce robots for industry or medicine, develop systems based on smart phones or improve data systems and networks.

Mechatronics engineering is also used in the development, design and operation of the processes and production lines used to make most consumer products.

WHAT DO MECHATRONICS ENGINEERS DO?

Key to mechatronics engineering is the ability to analyse and design complex machines and systems, which often involve automation.

Mechatronics engineers work with instrumentation, sensors and computer systems. They use these to control movement, optimise processes, monitor systems and detect faults.

Mechatronics engineers can be found working in product development, production lines, and in places where reliability and safety are essential to engineering operations. They design and develop control systems for vehicles, aircraft, machinery, production lines and can now be found working in biotechnology and biomedicine.

Being multidisciplinary in nature, mechatronics engineers are highly skilled at managing projects and teams which bridge the traditional areas of mechanical and electrical engineering.

Monash University Nova Rover Team was the first Australian student group to be selected to compete in The Mars Society University Rover Challenge. The annual robotics competition held at the Mars Desert Research Station in the United States, challenges teams to design and build a rover to be used by explorers on Mars. The team was made up of students from Engineering, Science, Law, Business and Medicine and were placed top 20 in the world.
CAREERS IN MECHATRONICS ENGINEERING

YOUR GLOBALLY RECOGNISED COURSE COULD SEE YOU WORKING IN MANY SPECIALIST AREAS INCLUDING:

SMART MANUFACTURING AND IOT
PRODUCT AND PROCESS DESIGN
BUILDING SYSTEMS AND DESIGN
RESEARCH AND DEVELOPMENT
COMPUTATIONAL ANALYSIS

TECHNICAL SALES AND SUPPORT
FIELD AND TEST ENGINEERING
PROJECT MANAGEMENT
POWER PLANT OPERATION
QUALITY CONTROL
DEFENCE INDUSTRIES

INDUSTRIES EMPLOYING MECHATRONIC ENGINEERS ARE:

MANUFACTURING
TRANSPORT
AUTOMOTIVE
ANIMATRONICS
LOGISTICS
IMAGING
AEROSPACE

ELECTRONICS
MINING
ROBOTICS
BANKING
CONSULTING
MEDICAL DEVICES
TELECOMMUNICATIONS

AS A MECHATRONICS ENGINEER, YOUR CAREER POSSIBILITIES ARE AS EXCITING AND DIVERSE AS THE COURSE ITSELF.
WHY MONASH?

REPUTATION
Monash University has a strong global reputation supported by impressive credentials. We are rated as number one for engineering in Australia and are in the top one percent of universities in the world for engineering (Times Higher Education Rankings 2018).
The Faculty of Engineering is recognised as producing research that is well above world standard (Excellence in Research for Australia 2015).

WORLD-CLASS FACILITIES
Engineering is a hands-on discipline that requires the very best facilities to support your learning. Monash is proud to host a range of world-class engineering facilities.

MORE CHOICE, GREATER FLEXIBILITY
Monash offers the widest choice of engineering courses in Australia. We offer you the flexibility of the common first year – and the opportunity to broaden your career options with a double degree.

THE TOTAL EXPERIENCE
Monash Engineering is well-known for its integration of practical and theoretical learning. The faculty offers a range of enrichment activities to open your eyes to a world outside the classroom. Some of these activities include the Monash Motorsport team, the Unmanned Aerial Systems team, the Nova Rover team, Monash Human Power team, the Engineering Leadership Program, the Monash Industry Team Initiative and the Summer Research Program.

PROFESSIONAL RECOGNITION
The Monash Engineering degree is accredited by Engineers Australia. Engineers Australia is signatory to the Washington Accord – an international agreement among bodies responsible for accrediting engineering degree programs. This means that your Monash engineering qualification will be automatically recognised in any of the signatory countries.

MECHATRONICS ENGINEERING AT MONASH

THE DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING
The Department of Mechanical and Aerospace Engineering is globally renowned for its teaching, its research and its facilities. It is the largest department in the Faculty of Engineering with a dynamic academic, postgraduate and postdoctoral community.
Undergraduate students regularly interact with postgraduates and postdoctoral researchers.
Our researchers perform innovative work in exciting and globally relevant areas – including micro-nano devices, robotics, biomedical devices, materials design, advanced manufacturing, aerodynamics, energy, structural monitoring, wind engineering, and the latest in biomedical imaging. This research is shared with undergraduates in the classroom.

THE DEPARTMENT OF ELECTRICAL AND COMPUTER SYSTEMS
The Department of Electrical and Computer Systems Engineering is in a rapidly changing and innovative discipline area and this is reflected in its dynamic, inspiring teaching, research and extensive laboratory facilities. There is an emphasis on emerging areas such as efficient energy utilisation, wireless and broadband telecommunications, biomedical engineering, autonomous robotics, sensing and image recognition, as well as sophisticated control techniques for plant, transportation and power systems. Students acquire a strong grasp of reconfigurable real time computing and the interaction between electronics and the real world by a wide range of sensors and actuators.
COURSE OVERVIEW AND STRUCTURE

The degree in mechatronics engineering is completed over four years full time or eight years part time. Double degrees can also be offered with arts, commerce, commerce specialist, and science.

LEVEL 1
The first level of the course has units common across engineering disciplines. At the end of your first year, you can apply to specialise in mechatronics engineering.

LEVEL 2
Level two provides students with fundamental knowledge across the wide range of disciplines which form the basis of mechatronics. These include thermodynamics, fluid mechanics, electronics, mechanics, computer programming and digital electronics.

LEVEL 3
During level three, students begin to link their fundamental knowledge of mechatronics to professional areas including instrumentation, manufacturing and modelling. Students also gain practical experience by undertaking a design and build project unique to the mechatronics course.

LEVEL 4
In level four, as well as undertaking specialist subjects in a diverse range of topics such as robotics, imaging, control and measurement systems, students do a major project which involves elements of design, development, testing and research. Students are also given an introduction to life as a mechatronics engineer through involvement in professional practice.

COURSE HIGHLIGHTS

Understanding important aspects of mechanical and electrical engineering gives mechatronics students the edge in contributing to a range of student project activities. These activities can be undertaken throughout the degree or occur in specific year levels.

As a mechatronics student you could be asked to help design and develop engine and vehicle control systems for the Monash Motorsport Formula SAE team. Formula SAE is the world’s largest student engineering design competition. The Monash team has been Australasian champion seven times since 2009.

For the Monash Unmanned Aerial Systems team (UAS), mechatronics students assist with flight planning, avionics, power systems and flight control for the autonomous aircraft being developed for the Australian UAV Search and Rescue Challenge.

LEVEL 2 HIGHLIGHTS
In level two of the degree, mechatronics students compete with other engineering students for the chance to represent Monash in a national design competition organised by Engineers Australia. Each year the design task requires greater reliance on computer control of electro-mechanical systems as you attempt to successfully steer the device you have designed through the set course.

LEVEL 3 AND 4 HIGHLIGHTS
In levels three and four of the degree, mechatronics students undertake design and build projects which could involve things as diverse as robots for manufacturing and surgery, autonomous robots, vehicles and aircraft, micro-fluidics, and sensors for remote monitoring and mapping.
MEET OUR GRADUATES

ANDREW BOAST
Bachelor of Mechatronics Engineering (Honours)

Andrew completed his tertiary studies at Monash University Clayton Campus in 2009. He has since been employed as a Project Engineer at a firm in Moorabbin with a proud history servicing major companies, both locally and overseas.

“Working as a project engineer has allowed me to continually develop and apply a diverse range of technical and management skills across large projects in the manufacturing, automotive and mining industries. With a foundation in Mechatronics, I have been involved in both the mechanical and electrical elements of these projects.”

“The opportunity to design and build machines to allow companies to expand operations, become more efficient, and enhance safety has been a rewarding one.”

FINN ANDERSEN
Bachelor of Mechatronics Engineering (Honours)

“As a final year student I designed an automated air hockey parlour game that is actuated by motors and uses computer vision to track the puck on the table. During my Graduate Program at Telstra I’ve had the opportunity to rotate between three groups within the Networks unit of the business. Currently I’m in the Home group which is responsible for development of household internet gateways as well as the Telstra Air WiFi network. One of my major tasks in this group has been to create a signal strength heatmap of the Telstra Air WiFi network in the Melbourne CBD. This involved WiFi scanning for data collection, data processing and visualisation using Javascript and the Google Maps API. I’ve also had the opportunity to conduct WiFi device testing in the Home Integration Lab, which is designed to simulate the conditions of a realistic household.”

CHI NGUYEN
Bachelor of Mechatronics Engineering (Honours) and Bachelor of Science

Chi is currently working as a Teaching Associate at Monash University assisting students to better understand Kinematics and Dynamics in Robotics.

“I enjoy teaching and my role enables me to keep my knowledge up-to-date. Monash University has rich resources and state-of-the-art facilities that enables me to make the most out of my academic career.

If there was one piece of career advice I would tell my student-self it would be to be yourself and work hard on what you love, even though you may not see the outcomes of your efforts right away. The course is intensive and demands seriousness and a genuine passion for study. Monash University is a safe environment that encouraged me to do my best, to learn from my failures and improve myself. All these have equipped me with essential skills and a proactive attitude to meet challenges in the real world.

One of the highlights of my degree and my greatest honour was to be awarded Top Mechatronics Student for the Department of Mechanical and Aerospace. The award is the result of my continuing to strive for excellence for 4 years despite the challenges. I hope I have made my fellow international students proud and have set an example for industriousness and perseverance.”
NEXT STEPS

COURSE DETAILS

Location: Clayton
Indicative ATAR: 91.05*
Indicative IB Score: 34*
Duration: 4 years
Degree awarded: Bachelor of Mechatronics Engineering (Honours)

HOW TO APPLY

Domestic (Australian) and onshore international students

Apply through VTAC if you are an Australian or New Zealand citizen, an Australian permanent resident, or you are an international student studying an Australian Year 12 or IB in Australia or New Zealand, apply through the Victorian Tertiary Admission Centre (VTAC).

Visit vtac.edu.au for more information.

International students

International students should apply directly to Monash University and must have completed an equivalent qualification to the Victorian Certificate of Education (VCE) and the prerequisite subjects or equivalent.

For more information, visit monash.edu/study/international

CONNECT

Please contact the Department of Mechanical and Aerospace Engineering to find out more.

Web
monash.edu/engineering/mechatronics

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* The scores are to be used as a guide only, and are either lowest selection rank to which an offer was made in 2018 or an Estimate (E).