



MONASH
University

MONASH
AEROSPACE
ENGINEERING

monash.edu/engineering/aerospace





WHAT IS AEROSPACE ENGINEERING?

Aerospace engineering deals with the design, manufacture and maintenance of flight vehicles. It is a multidisciplinary field that encompasses aerodynamics, aerostructures, avionics, propulsion, flight control, design and materials engineering.

WHAT DO AEROSPACE ENGINEERS DO?

Aerospace engineers apply scientific and technological theories, concepts and equations to vehicles within the earth's atmosphere and beyond.

Activities include the use of wind tunnels for aerodynamic testing, computational modelling for predicting structural behavior, examination of propulsion system performance, and materials and structural testing.

The profession is at the forefront of innovation as it seeks to further improve operating efficiencies while reducing environmental impact.

AEROSPACE ENGINEERS STUDY:

Aerostructures: principles of structural mechanics and analytical techniques to ensure a vehicle's structural integrity.

Aerodynamics: fluid motion around a body moving through the atmosphere at subsonic and hypersonic speeds.

Propulsion: basics of thrust generation by the application of aero/gas dynamics and thermodynamics.

Flight control: the analysis of flight, including techniques for vehicle guidance and stability, space vehicle trajectories and orbits.

Aerospace materials: advanced materials used in the airframe and in propulsion systems.

Aerospace design: preliminary design of the complete aircraft, which emphasises systems integration.

CAREERS IN AEROSPACE ENGINEERING

As an aerospace engineer, your career possibilities are exciting and diverse, with many future challenges in which to participate.

You might work in aircraft design and maintenance, aerospace control systems, aerodynamics, sustainable energy and conservation, lightweight materials, big data analytics, or new manufacturing techniques.

AERONAUTICAL/AEROSPACE

RESEARCH AND DEVELOPMENT

DEFENCE INDUSTRIES

AIRCRAFT DESIGN AND TESTING

MANUFACTURING MATERIALS
TECHNOLOGY

AVIONICS AND CONTROL SYSTEMS

AIRPORT OPERATIONS AND
MANAGEMENT

AIRCRAFT FLEET MANAGEMENT

AIRWORTHINESS, CERTIFICATION
AND REGULATION

AERODYNAMICS AND WIND ENGINEERING

ROAD AND RAIL VEHICLE
DESIGN AND TESTING

BUILDING AND STRUCTURE
DESIGN AND TESTING

AIR QUALITY MONITORING

COMPUTATIONAL FLUID
MECHANICS AND MODELLING

RENEWABLE ENERGY

AEROSPACE ENGINEERING AT MONASH ALSO OPENS UP OPPORTUNITIES IN A DIVERSE RANGE OF FIELDS INCLUDING:

- mechanical engineering
- manufacturing and processing
- transportation engineering
- bio-engineering
- nano and micro scale engineering
- mining, resource and energy management
- logistics
- project management.



WHY MONASH?

REPUTATION

Monash University has a strong global reputation supported by impressive credentials. We are rated 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, the 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.

COURSE HIGHLIGHTS

UNMANNED AERIAL SYSTEMS TEAM

The Monash Unmanned Aerial Systems (UAS) team is a group of enthusiastic students and supervisors who work together to design, construct and fly fully autonomous aircraft. The primary focus of the team is the UAV Search and Rescue Challenge, which runs every two years and is a well-established international competition that attracts teams from around the world to compete in outback Queensland. The team flew in the competition in 2014, 2016, and is on track to compete in 2018 with a hybrid fixed/rotary wing aircraft with a 100 km range.

This project brings together aerodynamics, propulsion, structures, avionics, vision systems and automatic control for design, development and competition.

This hands-on experience gives students a very special opportunity to develop their teamwork and project management skills while building their technical and operational understanding of the industry.

MONASH UNIVERSITY NOVA ROVER TEAM

The Mars Society University Rover Challenge is a robotics competition that challenges teams to design and build a rover to be used by explorers on Mars. The annual competition is held at the Mars Desert Research Station located in the United States.

From their base in the Department of Mechanical and Aerospace Engineering, the Monash University's Nova Rover Team was the first Australian student group to be selected to compete in the Rover Challenge. The team is made up of students from Engineering, Science, Law, Business and Medicine. The challenge involves designing a rover able to traverse extreme terrain, navigate autonomously and conduct field work tasks, including collection and analysis of geological samples.

In their first attempt at this challenging international competition the Monash team were placed top 20 in the world.

AEROSPACE 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.

COURSE OVERVIEW AND STRUCTURE

The aerospace engineering degree program at Monash recognises the global nature of engineering in the world economy and encourages an international focus.

The structure of the program is designed to progressively build your understanding – then apply this knowledge in your final year with an independent research project, technical electives and an industry practices unit.

Project-based units emphasise the interdisciplinary nature of engineering. They also aim to develop your teamwork, project management, communication, practical design and research skills.



DOUBLE DEGREES

More and more organisations seek engineering graduates with expertise in other disciplines. They increasingly value the breadth of knowledge evident in Monash double degree graduates.

A double degree allows you to pursue a career in either area – or to take up one of the many opportunities emerging at the interface of disciplines.

Combine your aerospace engineering qualification with another bachelor's degree in:

ARTS

COMMERCE

LAWS

SCIENCE

MEET OUR GRADUATES



CARLY SWARD
Graduate Development Program,
Department of Defence

When Carly graduated, she was thrilled to secure a graduate program position at the Department of Defence. She loved the diversity which ranged from providing technical and policy advice from her desk in Canberra to touring military bases around the country.

"I was involved in large infrastructure development planning, I completed strategy and communication training courses and I explored equipment such as F/A-18s, Abrams tanks and everything in between," says Carly.

During her first graduate rotation, Carly worked on land management and biosecurity policy within the Infrastructure Division. Her second rotation was in the Defence Intelligence Organisation and involved technical analysis of weapons systems and emerging technologies.

She also represented Defence in meetings with other commonwealth and state officials and visited several bases and training areas within Australia.

Carly says she found the learning environment at Monash supportive and believes that the equipment in workshops, laboratories and testing facilities helped to develop the technical skills industry demands.



AARON CORERA
Remote Pilot and Safety Manager,
XM2 Aerial

Aaron works at aerial cinematography company that design, test and operate unmanned aerial vehicles with high end cameras. XM2 work around the world on TV shows, commercials and feature films, including Pirates of the Caribbean, Pacific Rim Uprising, Thor Ragnarok, Lion and Aquaman. "It's an amazing experience to be on the set of feature films but even more amazing is being able to see that work on the big screen at the movies."

"I have a number of roles in the company, which have taken me across Australia and around the world. As a Remote Pilot and Drone Technician, I am involved in operating and maintaining the aircraft and payloads. I also work as the Safety Manager assessing the feasibility and risks of our UAV operations and putting tools and practices in place to mitigate those risks."

Aaron's highlight while at Monash was being involved in the Unmanned Aerial Systems (UAS) Team.

"In my three years on the team, I was able to gain skills such as leadership, time management and team management and work on some modern, experimental aircraft.



RHIANNON KIRBY
PhD student in jet aeroacoustics
Intern, NASA Ames Research Center

After graduating, Rhiannon travelled to Silicon Valley in California to undertake an internship program at NASA Ames Research Center. Rhiannon's role is in the Thermophysics Facilities Branch of the Entry Systems and Technology Division. The organisation maintains facilities to simulate the extreme flow conditions encountered in supersonic and hypersonic flight applications, that enables the design, testing and certification of space vehicle thermal protection systems.

"The goal of my work is to improve the understanding of sample test flow conditions in plasma arc jets, by identifying concentrated density variations using non-intrusive flow visualisation techniques."

"My five-year double degree in science and aerospace engineering enabled me to develop a broad toolkit of fundamentals with which to commence future research. My time at Monash has nurtured my curiosity in a range of fields while allowing the freedom to specialise and be exposed to the international research community."

NEXT STEPS

COURSE DETAILS

Location: Clayton

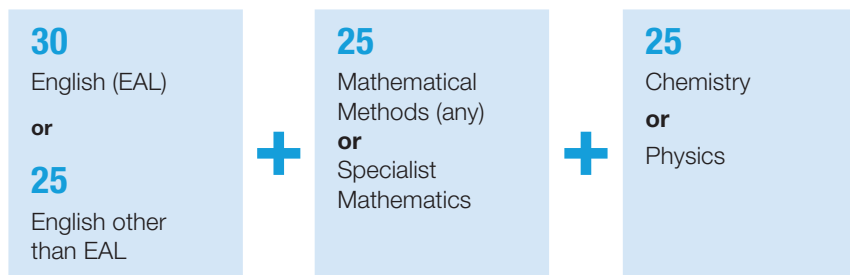
Indicative ATAR: 91.05*

Indicative IB Score: 34*

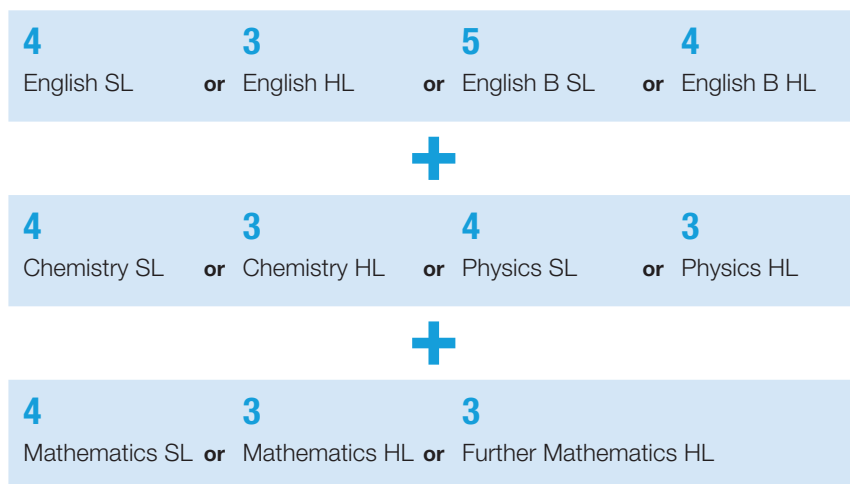
Duration: 4 years

Degree awarded: Bachelor of Aerospace Engineering (Honours)

VCE prerequisites (units 3 and 4)



International baccalaureate subject prerequisites



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/aerospace

Email

mae.student-enquiries@monash.edu

Phone

+61 3 9905 3545

* 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).

Further information

monash.edu/engineering/aerospace

1800 MONASH (1800 666 274)

The information in this brochure was correct at the time of publication (July 2018).
Monash University reserves the right to alter this information should the need arise.
You should always check with the relevant Faculty office when considering a course.

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