

CAREERS WITH STEM™

DEFENCE

**ELECTRONIC
TECHNICIAN**

**Rocket
into space
careers**
p16

**Sea change:
Build up
Australia's
maritime
Defence**
p22

**Access
great study
support**
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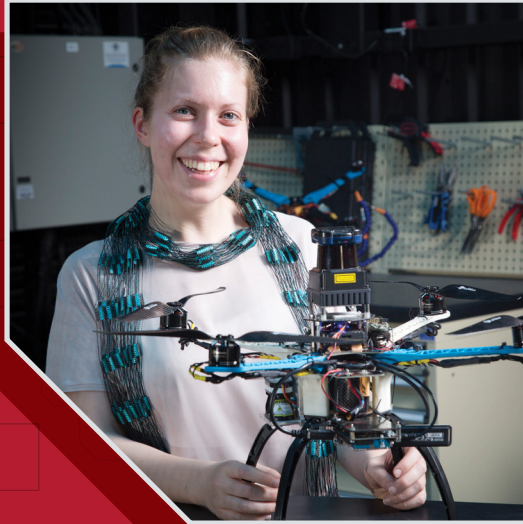
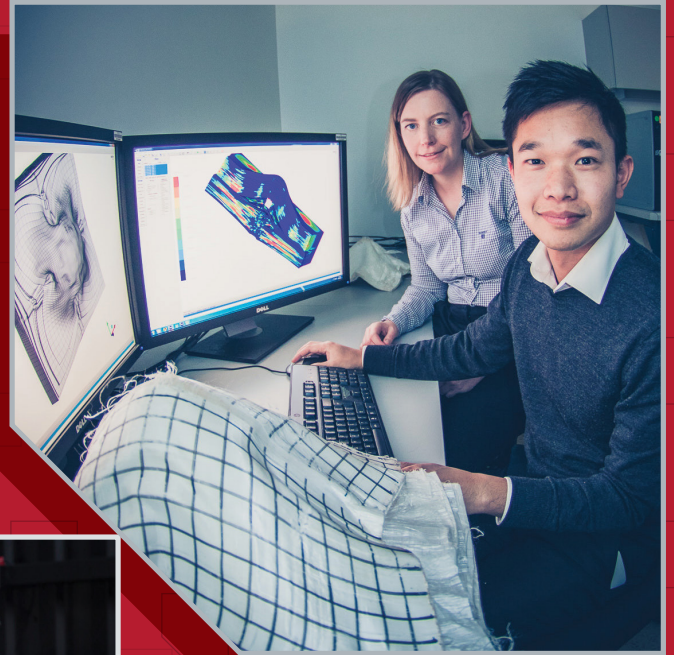
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**MATERIALS
SCIENTIST**

CAREERSWITHSTEM.COM



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for a STEM cadetship with Defence.

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Email us: stem.cadetship@defence.gov.au



STEM IS MORE THAN SCHOOL SUBJECTS

Science, technology, engineering and mathematics are the keys to tomorrow's world

TANYA MONRO
PROFESSOR, CHIEF
DEFENCE SCIENTIST



As advances in technology impact all our lives, new jobs and careers are emerging to keep up with the rapidity of change. At the same time, globalisation and the mass automation of many formerly manual tasks and data collection are encouraging new visions of what it means to be human in a complex, extraordinary world where artificial intelligence and biotechnology are leaping ahead. Nowhere are these changes more important than in securing the safety of our nation. Defence is leading the way in embracing new technologies and new ways of doing business. Our STEM professionals work at the leading edge of technical innovation, ensuring our Navy, Army and Air Force personnel are equipped with the best technologies, knowledge and know-how. We do STEM for a purpose. In Defence, we recognise that STEM is more than just a collection of subjects; it's a way of thinking — asking questions, considering data and evidence and being curious. It's also about striving for a deep understanding of the problems — and being creative. These are the skills we need to address the most pressing Defence and security

STEM IS MORE THAN JUST A COLLECTION OF SUBJECTS; IT'S A WAY OF THINKING"

challenges. Defence is intent on growing a STEM workforce that draws on the best and brightest from across Australian society, ensuring a diversity of background, thought and perspectives, which is so important for true discovery and innovation. I commend to you this latest edition of *Careers with STEM: Defence*. In it you will find real-world career profiles that are bound to inspire, as well as practical tips and advice from Defence personnel in a range of exciting fields.

Yours in STEM,
Professor Tanya Monro AC

CHIEF DEFENCE
SCIENTIST

DIRECTOR, INSTITUTE FOR
PHOTONICS + ADVANCED SENSING

PHD

BACHELOR OF SCIENCE
(HONOURS)

DEFENCE + X

No matter your passion, there's a STEM career in Defence for everyone

To help you find your dream career in Defence, try our secret formula. We call it Defence + X, where X equals your interest, another field or a life-changing goal. Think Defence + cyber security = cyber warfare operator; Defence + robots = army mechatronic and electrical engineer; or Defence + space = satellite engineer. And at the core of these careers? Some serious STEM skills, of course!

We've divided this issue of *Careers with STEM*: Defence into seven X areas for you to explore. Here, you'll find dream roles, salary details and the stories of people working in the Navy, Army, Air Force and Defence Science and Technology Group (DSTG). Find out how to get started, the study or training you'll need, and what jobs are in demand.

P10

DEFENCE + APPRENTICESHIPS

Jump into Defence through trades and apprenticeships, or directly after Year 10 through general entry pathways. You could work in everything from mechanics and electronics to IT!

DEFENCE + FOOD + AGRICULTURE

Use nutrition science know-how to optimise the health of military personnel or ensure food security by defending Australia's shipping and trade routes.

P15

P16

DEFENCE + SPACE

Space is critical for Defence communications, combat effectiveness and situational awareness. Work with satellites or in systems engineering, air surveillance, research and more.

P20

DEFENCE + QUANTUM

Be at the frontline of quantum research, uncover new materials and be part of some epic projects – like using diamonds to track submarines!

P22

P26

DEFENCE + CYBER SECURITY

Cyberspace is the new frontline for Defence, with career opportunities in everything from network protection to researching cyber attack techniques.

P28

DEFENCE + ROBOTS + AI

Design, build and manage robotics and Artificial Intelligence (AI) systems. You could help create autonomous defence systems and make aircraft smarter!

9

Epic Defence careers!

STEM JOBS IN DEFENCE OFFER AN AMAZING VARIETY OF EXCITING OPPORTUNITIES FOR YOU TO MAKE A DIFFERENCE TO THE WORLD

Defence includes a huge range of jobs in the Australian Public Service, as well as in the Australian Defence Force, made up of Navy, Army and Air Force. You'll get to work on really important projects and learn a lot of new things, plus build teamwork, leadership and problem-solving skills that will be useful in any job you do. And there are unique jobs you can do working in STEM and Defence that you won't find anywhere else!

1

Marine technician on submarines

Want to work with really cool underwater technology? Marine technicians are in charge of making sure the mechanical and electrical systems on submarines are working properly. You'll get to use your technical skills and problem-solving abilities to keep everything running smoothly.

2

Weapon technician

A weapon technician maintains and repairs weapons systems on all kinds of Defence equipment. You'll be working with complex and potentially dangerous equipment, so you'll need a good understanding of mechanical and electrical systems – but thinking on your feet, creativity and problem-solving skills are also super important!

3

Fitness expert

Defence employs health, nutrition and sports professionals to help military personnel stay healthy and in good shape. This requires a strong understanding of fitness, nutrition and health for their specific situation. You may work in a variety of settings, including gyms, training centres and hospitals.

4

Doctor

As a doctor, you'll provide medical care to military personnel. This career involves working in a potentially high-stress environment, on a ship or in a field hospital, and requires a deep understanding of medical procedures and protocols. Defence doctors need to work effectively under pressure and adapt to changing conditions.

5

Air Force engineer

If you love engineering and aircraft, this is the job for you! Air Force engineers are in charge of designing, building, and maintaining aircraft and related systems. You'll be working with complex and specialised equipment, and require a lot of knowledge about engineering principles and technologies.

6

DSTG engineer

Engineers at Defence Science and Technology Group (DSTG) are responsible for researching and developing technologies and systems for use across Defence. For example, a microfabrication engineer designs and builds tiny devices such as sensors. This career requires knowledge of engineering principles and advanced manufacturing.

7

Special projects scientist

DSTG also comprises a range of specialist Defence scientists. For example, a data analyst might be hired to study data from various sources in order to improve the performance and effectiveness of existing Defence systems.

8

Robotist/autonomous systems engineer

Defence employs engineers to design and build robots and other autonomous systems that can be used to detect and remove mines from waterways and other areas. This helps keep military personnel out of harm's way.

9

Communications and information systems operator

These people are responsible for maintaining and operating systems including radio and satellite, computer networks and servers. This is a super-important gig that will equip you with a range of skills you can take anywhere.

Electives MATCH UP

What you study in Year 11 or 12 or through VET can set you up for a career in Defence. Here's how!

Hands up who's sat in class wondering when you'll ever use trigonometry or apply Newton's Laws of Motion in the future? This page is for you. Think of the following electives as the very first steps on your STEM + Defence study and career path. These subjects can kickstart your knowledge in essential areas

needed for some very cool and unexpected jobs in Defence, and we've filled them in with some potential study paths. You're welcome!

STUDY MATHEMATICS

A

Complete a Certificate III in Carpentry, then complete military and employment training with Defence

**AIR FORCE
CARPENTER**

B

Take the recruit course, then complete the combat engineer course at the School of Military Engineering and the trade training plumber course at the Army School of Electrical and Mechanical Engineering

**ARMY
PLUMBER**

C

Study a Bachelor of Mathematics or Data Analytics

**DATA ANALYST
AT DSTG**

A DRONE USED DURING EXERCISE AUTONOMOUS WARRIOR, WHICH TESTS AUTONOMOUS SYSTEMS AND TECHNOLOGIES

ABIS STEVEN THOMSON

STUDY PHYSICS

A

Study a Bachelor of Science, majoring in physics and go on to Honours, Masters or a PhD.

**QUANTUM
TECHNOLOGIES
RESEARCHER
AT DSTG**

B

Study a Bachelor of Engineering (Honours) (Aerospace Engineering), then complete military and employment training with Defence

**NAVY AEROSPACE
ENGINEER**

TAKE ELECTROTECHNOLOGY AS A VET SUBJECT

A

Complete a Certificate III in Electrotechnology, then complete military and employment training with Defence

**AIR FORCE
ELECTRICIAN**

B

Study a Bachelor of Engineering, majoring in electrical/electronics, then complete military and employment training with Defence

**NAVY AIRCRAFT
ELECTRONICS
ENGINEER**

STUDY ENGINEERING

A

Study a Bachelor of Engineering (Civil) or (Structural) then complete military and employment training with Defence

**AIR FORCE
AIRFIELD
ENGINEER**

B

Study a Bachelor of Engineering (Honours) (Aerospace Engineering), then complete military and employment training with Defence

**ARMY
AERONAUTICAL
ENGINEER**

C

Study a Bachelor of Space Science

**SATELLITE
ENGINEER
AT DSTG**

STUDY SOFTWARE DESIGN AND DEVELOPMENT

A

Study a Bachelor of Cyber Security

CYBER SECURITY SPECIALIST

B

Study a Bachelor of Computer Science alongside the AGO STEM Cadetship Program

SOFTWARE ENGINEER AT AUSTRALIAN GEOSPATIAL-INTELLIGENCE ORGANISATION (AGO)



MARITIME LOGISTIC CHEF, ABLE SEAMAN **BENJAMIN** COOKS IN THE GALLEY ABOARD HMAS PERTH DURING EXERCISE LA PEROUSE IN 2023.

LSIS SITTICHA SAONPOONPOL

STUDY FOOD TECHNOLOGY

A

Study a Bachelor of Science (Nutrition Science)

NUTRITIONIST-DIETITIAN AT DSTG

B

Complete a Diploma of Food Science and Technology

FOOD TECHNOLOGIST AT DSTG

C

Complete military training, the Initial Cook's Course, plus submariner courses with Defence

NAVY CHEF SUBMARINER

STUDY EARTH AND ENVIRONMENTAL SCIENCE

A

Study a Bachelor of Science (Environmental Health), then complete military and employment training with Defence

AIR FORCE ENVIRONMENTAL HEALTH MANAGER

B

Complete military training, then take the following courses through Defence:

- Basic Seamanship Course
- Combined Jet RHIB Coxswain/4.7m Leg RHIB Course
- Basic Hydrographic Systems Operator Course

NAVY HYDROGRAPHIC SURVEYOR

ROYAL AUSTRALIAN AIR FORCE ENVIRONMENTAL OFFICER, FLIGHT LIEUTENANT **CHLOE** IS DEPLOYED ON OPERATION ACCORDION AT THE AUSTRALIAN DEFENCE FORCE'S MAIN OPERATING BASE IN THE MIDDLE EAST



CPL TRISTAN KENNEDY

TAKE INFORMATION AND DIGITAL TECHNOLOGY AS A VET

A

Study a Bachelor of Information and Communications Technology while completing the ASD Cadetship Program

ICT SPECIALIST FOR THE AUSTRALIAN SIGNALS DIRECTORATE

B

Study a Certificate IV in Surveying and Spatial Information Services while completing the AGO Trainee Program

TRAINEE APS (TECHNICAL) LEVEL 3 WITH AGO

Celebrating diversity

Want an employer that champions diversity? Everyone is welcome and supported in Defence



NATALIE
DEFENCE SCIENTIST.
DSTG

Defence needs to solve big problems like global security challenges.

"This requires the full scope of talent and potential," says Chris Matterson, DSTG's Assistant Director Inclusion and Indigenous Engagement.

In practical terms, this means:

- Equal opportunity for women across every role
- Targeted employment pathways for Aboriginal and Torres Strait Islanders
- Removing real or perceived barriers in the workplace for people with disability
- Providing an inclusive environment that respects, values and utilises contributions of people with different cultural backgrounds, sexual orientations or gender identities

One way Defence addresses these goals is the DSTG disAbility Action Plan.

"The plan works to maintain an inclusive workplace that is disability confident, is accessible and contributes to the overall health, wellbeing and job satisfaction for people with disability," says Chris.

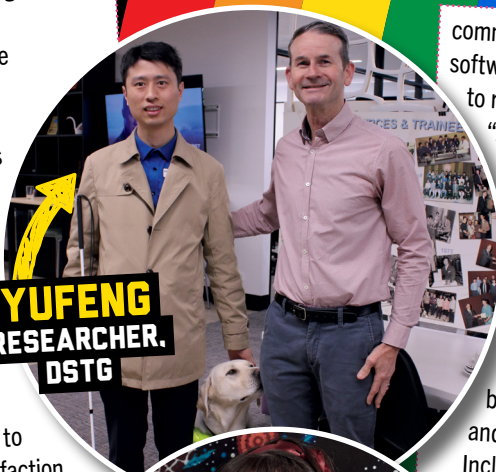
A flexible, inclusive environment

Yufeng is a researcher at DSTG and has a degenerative eye condition that requires ongoing adjustment to his workplace environment.

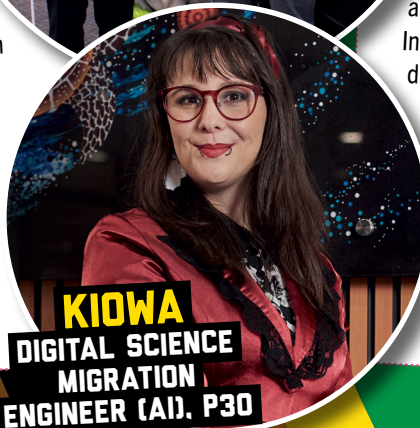
"DSTG has provided this over my 13-year career, including accessible information and



CHRIS
AIR SURVEILLANCE
OPERATOR



YUFENG
RESEARCHER.
DSTG



KIOWA
DIGITAL SCIENCE
MIGRATION
ENGINEER (AI). P30

SCHOLARSHIP ALERT

Women only make up 36% of enrolments in university STEM degrees and 27% of the STEM workforce. To help bridge this gap, Defence is offering Undergraduate Women in STEM Scholarships to provide financial support to women studying STEM degrees with a Defence connection.

If you're a woman in your second or third year of a STEM degree, you could be eligible for one of these scholarships. They're worth \$10,000 per year for two years of full-time study (or part-time equivalent).

Scan the QR code to learn more!



communications technology (ICT) equipment and software and, more importantly, I have been able to realign my work tasks and duties," he says. "A flexible work arrangement has also improved my work-life balance after having a child with autism spectrum disorder."

Proud First Nations man Chris is an air surveillance operator in the Air Force.

"I hope to lead First Nations youth into Defence," he says. "Defence has enabled me the pathway to attempt to achieve this by being involved in Indigenous youth programs and PCYC information sessions for at-risk youth." Inclusivity extends to welcoming people at different stages of life, too. Just ask Natalie, an industry experience placement student and defence scientist at DSTG.

"A university lecturer forwarded me an email about doing a placement at DSTG. I thought it would only be for younger students," she says. "I emailed DSTG to check that I could apply and the reply was a resounding yes!" – by Louise Meers

LEADING THE WAY

AS THE EXECUTIVE OFFICER ON HMAS HUON, **LIEUTENANT RACHAEL COSGROVE** EMPOWERS TEAMS TO BRING THE FORCE TO FIGHT AND WIN AT SEA

Rachael wanted to serve her country and be challenged, so she landed in Defence! She's the executive officer and second-in-command in HMAS *Huon*, a minehunter coastal vessel.

She loves that her role is about empowering people: "You have to learn how to get the best out of everyone you have in your battle space."

Rachael is also president of the Defence LGBTI Information Service (DEFGLIS), which delivers a safe and inclusive space that is trusted to advocate for and support the needs of LGBTQI members: "We work closely with commanders and managers to provide education and awareness pieces, as well as supporting our members through specific peer programs and networks."

DEFGLIS also arranges events and opportunities for celebration and connection, strengthening ties to other members of the same diverse group.

Passionate about diversity, Rachael believes it helps drive agile, broad decision making, robust procedure and policy, and creates a workforce that is smarter and more innovative.

RACHAEL
EXECUTIVE OFFICER,
NAVY



LEADING
SEAMAN

MARITIME
WARFARE OFFICER

PRINCIPAL WARFARE
OFFICER COURSE

EXECUTIVE
OFFICER

PRESIDENT,
DEFGLIS

MATHAN
AIRBORNE ELECTRONIC
ANALYST, AIR FORCE

GIVING BACK

GROWING UP IN AUSTRALIA AFTER FLEEING WAR AS A CHILD MOTIVATED **MATHAN**, CORPORAL AND AIRBORNE ELECTRONIC ANALYST, TO JOIN DEFENCE

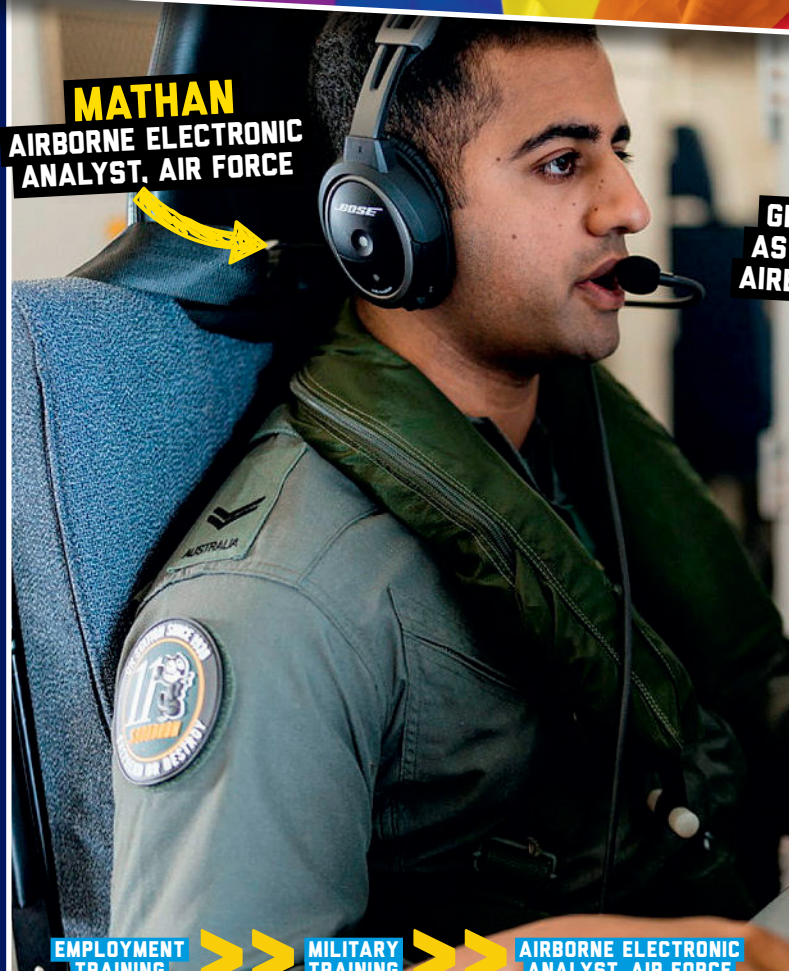
Mathan was born in northern Sri Lanka in 1995, when a civil war was raging, forcing his family to flee their home country.

"Migrating to Australia allowed my family to raise us safely and offered them an opportunity to work and build their lives back up," he says.

Mathan felt grateful for growing up in Australia and this gave him the motivation to give back in a Defence career.

He's now an airborne electronic analyst in the Air Force, responsible for operating a suite of sensors on the P-8 Poseidon maritime patrol aircraft: "My analysis of incoming data is crucial to the success of missions."

He loves that his role is objective-focused, that he gets a sense of achievement every time he steps off the aircraft, and that Defence provides a supportive environment, chaplains, psychologists and workshops: "I've also been fortunate to have a supportive chain of command at my unit who encourage us to pursue opportunities for professional and personal development."



EMPLOYMENT
TRAINING

MILITARY
TRAINING

AIRBORNE ELECTRONIC
ANALYST, AIR FORCE

Get TECHNICAL

Doing an apprenticeship with Defence combines exciting work with high-quality technical training

If you love getting hands-on experience and using STEM skills to be creative, solve problems and contribute to vital projects, a Defence apprenticeship could be the right path for you! Earn nationally recognised qualifications, work to support Australia's national security and develop skills that will set you up for life.

Whether you're keen to join the military or are looking for a civilian role, there are many STEM apprenticeship opportunities available that come with all the benefits of working for Defence. You'll be choosing a career with purpose and working in high-demand areas. You could even be working on some of the most cutting-edge, technically advanced equipment in the world!

– by Danielle Lucas

CIVILIAN DEFENCE APPRENTICESHIPS

There's a range of exciting civilian apprenticeships with Defence and government agencies, including:

- **APS** (Australian Public Service)
- **ASD** (Australian Signals Directorate)
- **AGO** (Australian Geospatial-Intelligence Organisation)
- **DSTG** (Defence Science & Technology Group)

You can get high-quality, in-demand skills in these apprenticeships that can set you up in a Defence career and are highly transferable to other industries. You could train in:

- **Electronics** • **Mechanical**
- **Cyber security** • **Programming in IT**
- **Spatial information services**
- **Software development**
- **Drafting** • **Shipbuilding**

Plus heaps more!

There are also awesome opportunities for Aboriginal and Torres Strait Islander students. Talk about options!

ELECTRONIC TECHNICIAN TRAINEES AT THE TECHNICAL TRAINING FACULTY AT HMAS CERBERUS, VICTORIA, AS PART OF THEIR INITIAL ENTRY TRAINING.

AUSTRALIAN DEFENCE FORCE APPRENTICESHIPS

Navy, Army and Air Force need highly trained technicians and tradespeople to ensure every piece of their valuable equipment is in peak condition.

From marine, electronics system, aviation or telecommunications technicians to carpenters, electricians and more, the Australian Defence Force (ADF) offers a huge range of STEM careers throughout Australia.

Navy Marine Technician

Maintain and operate machinery and systems on ships and submarines.

Army or Air Force Carpenter

Love building? As an ADF carpenter, you'll tackle diverse building projects and gain great trade skills.

Army Electronics System Technician

Explore your passion for cutting-edge technology by working on military vehicles and weapons systems.

Airforce Avionics Technician

Work on systems that control, navigate and arm the Air Force's awesome fleet.

YOUR PATHWAY TO A DEFENCE TRADE

ADF General Entry (Technical and Trade Apprenticeships)

Join the ADF and get full trade and employment training following your initial recruit training. Completion of Year 10 (or equivalent) is required, with passes in English, maths, science and one other subject. Some trade roles also require science with a physics component. If you already have a trade, you can join the ADF with that qualification being recognised.

ADF Gap Year

Get a taste for military life with one year as an aviation support technician, where you'll work on advanced military aircraft.

Defence TAFE Employment Scheme

Get a head start in your Defence career, getting paid to work part-time with the APS while you finish your studies.

APS Digital Apprenticeship Program

If you're a problem solver with a passion for digital tech and are finished (or finishing) Year 12, this could be a great option for you.

Indigenous Apprenticeship Program

This 12-month program for Indigenous and Torres Strait Islanders provides on-the-job training in the APS (including Defence), while you work towards a nationally recognised Certificate IV or Diploma qualification. You'll also get support including a buddy and an Indigenous mentor. Check out Services Australia for more info.

START YOUR CAREER HERE

DEFENCE + APPRENTICESHIPS + STUDY

Certificate III in **Engineering** and Certificate II in **Maritime Operations**, RAN

Certificate IV in **Aeroskills (Avionics)**, RAAF

Certificate III in **Telecommunications Technology**, Army

Certificate IV in **Spatial Information Services**, Australian Geospatial-Intelligence Organisation, APS

Certificate IV in **Cyber Security**, Australian Signals Directorate, APS

DEFENCE + APPRENTICESHIPS + JOBS

Navy Marine Technician
\$75,451*

Air Force Avionics Technician
\$75,451*

Air Force Aviation Support Technician (Gap Year)
\$71,750*

Army Telecommunications Technician
\$79,452*

Trainee Australian Public Service (Technical) APS Level 3
\$48,162–\$55,791

Source: defencejobs.gov.au/jobs/, apsjobs.gov.au/s/
* Pay on completion of initial military training and initial employment training.

GRACE
ELECTRONIC
TECHNICIAN, NAVY

ELECTRONIC TECHNICIAN,
ROYAL AUSTRALIAN NAVY

SALES ASSISTANT,
RETAIL

YEAR 10
CERTIFICATE

CIRCUIT BUILDER

GRACE WANTED A HANDS-ON CAREER, AND SHE'S FOUND IT IN HER ROLE AS A NAVY ELECTRONIC TECHNICIAN

Grace is an electronic technician in the Royal Australian Navy and just getting started on her career journey. After completing Year 12, she worked as a sales assistant before deciding to pursue a career in Defence.

"I wanted to work in a diverse workplace and be able to explore different places while learning new skills and making new friends along the way," she explains. "I am from a small country town in the middle of Queensland where there weren't heaps of opportunities outside of mining."

Grace initially became interested in the Defence Force after having members come and speak at her school about career opportunities.

"I did a lot of research into the Defence Force myself with the support of my parents," she says.

HANDS-ON CAREER

In her current job, Grace is learning to understand and work with electronics in a Defence environment.

"This involves learning the basic electrical fundamentals and having the knowledge to fault-find in circuitry work to be able to maintain and repair complex systems, while still being an active member of Defence," she says.

I WANTED TO WORK IN A DIVERSE WORKPLACE AND BE ABLE TO EXPLORE DIFFERENT PLACES WHILE LEARNING NEW SKILLS AND MAKING NEW FRIENDS ALONG THE WAY"

Grace has always been interested in STEM subjects, especially maths and science.

"I loved being hands-on and seeing how science, technology, engineering and mathematics come together," she says.

And she's already had the chance to work on some really cool projects as part of her apprenticeship, like making her own circuit boards and soldering them together.

Her advice for young people interested in pursuing a career in STEM and Defence?

"If something piques your interest, say yes to any opportunities you're offered because you never know what might happen!" – by Gemma Chilton

TRAINING THE TROOPS

A LOVE OF ENGINEERING LED **CHARLIE**, CAPTAIN AND TRADE TRAINING TROOP COMMANDER, TO A STEM GIG WITH DEFENCE WHERE HE SKILLS UP THE ARMY'S NEWEST TRADESPEOPLE



CHARLIE
TRADE TRAINING
TROOP COMMANDER,
ARMY

Since he was a kid, Charlie has been passionate about the 'E' in STEM – engineering – after being inspired by his grandad. Wanting to also serve in the Army, he did a Bachelor of Engineering (Honours) (Civil) at the Australian Defence Force Academy in Canberra, combining academic study with military training. "Defence has so many opportunities," he says.

WORK WITH PURPOSE

"I always wanted to be a civil engineer, but I also wanted a job that makes a difference. Serving in the Army gives me the opportunity to directly contribute to Australia, but also help people overseas who need it. I also love working in a strong team, and I love staying fit – both of which are key parts of working in Defence."

One of those opportunities saw him working on the Army Aboriginal Community Assistance Program in the remote

town of Pormpuraaw, Qld: "We delivered health support to the local Aboriginal people and constructed a number of projects to contribute to the community."

GET QUALIFIED

As Trade Training Troop Commander at the School of Military Engineering in Holsworthy, NSW, Charlie manages and supervises the Army's new tradespeople in training, who all spend time gaining civilian trade experience.

"I make sure they complete their training and are meeting the standards of their trade, to be ready for when they join the wider Army as fully qualified carpenters, plumbers and electricians," he says.

NEW HORIZONS

This year, he looks forward to meeting more newcomers and setting them up with the skills they'll need for the future.

His advice? "Get in touch with a family member or friend who used to be in Defence. Even if they weren't in STEM, there is a good chance they know someone who was."

– by Louise Meers

BACHELOR OF ENGINEERING
(HONOURS) (CIVIL), AUSTRALIAN
DEFENCE FORCE ACADEMY

ARMY OFFICER COMMISSIONING
COURSE, ROYAL MILITARY
COLLEGE, DUNTRON

PLANT TROOP
COMMANDER, 6TH ENGINEER
SUPPORT REGIMENT

TRADE TRAINING TROOP
COMMANDER, SCHOOL OF
MILITARY ENGINEERING

DIGITAL SWITCH

ALICE SWITCHED FROM MEDIA TO A DIGITAL APPRENTICESHIP AND NAILED AN AWESOME JOB AT THE AUSTRALIAN SIGNALS DIRECTORATE

Alice has always been keen on tech, but never envisioned a STEM career. After graduating with a communications degree, she ended up on a vastly different path when she signed up for a digital apprenticeship through Defence's Digital Transformation Agency.

"I actually applied out of curiosity," she says. "And I ended up uprooting my life for a 180-degree career change."

Alice now works as a trainee business analyst, gaining invaluable ICT skills, meeting like-minded colleagues and mentors, and working to bridge the gap between IT expertise and organisational needs by devising effective processes for the agency's partners in business and government.

With an epic list of projects constantly on the go, she has loads on her to-do list. Just don't ask her for any details...

"The most exciting projects are often the most hush-hush," she says. "You'll just have to make tracks to work here to find out!" – by Cassie Steel

TRAINEE BUSINESS
ANALYST, DEFENCE

DTA DIGITAL/ICT
APPRENTICESHIP

BACHELOR OF MEDIA
+ COMMUNICATION

SECURE SKILLS

AIRCRAFT STRUCTURAL TECHNICIAN **TRUNG** ALWAYS DREAMED OF BECOMING AN ASTRONAUT, BUT HE ENDED UP SCORING A DEFENCE GIG A LITTLE CLOSER TO EARTH

TRADE SUPERVISOR
QUALIFICATIONAIRCRAFT STRUCTURAL
TECHNICIANAIRCRAFT STRUCTURAL
FITTERCERT IV AEROSKILLS
(STRUCTURAL)

TRUNG
AIRCRAFT STRUCTURAL
TECHNICIAN, AIR FORCE

Aviation has always been Trung's thing. Dreaming of a career in space, he spent his childhood looking up at the sky and getting excited over anything that flew.

"I wanted to be an astronaut," he says. "But getting up close and personal with aircraft every day is still a childhood dream fulfilled."

Raised in Vietnam, the biggest hurdle in Trung's pathway was getting the support from his family to kickstart a career in the Australian Defence Force. With a mother who'd lived through the Vietnam War, it took a lot of convincing that working with military aircraft was safe, secure – and rewarding.

"I showed my mother that what I do protects the nation," he says. "Australia adopted three generations of my family post the Vietnam War – and I see this as a way I can return the favour."

CAREER IN THE CLOUDS

Upon applying for the Air Force after high school, Trung got skilled up – and fast – in some pretty

**I SHOWED MY
MOTHER THAT WHAT I DO
PROTECTS THE NATION"**

specific trades. Through Defence, he completed a Certificate IV in Aeroskills (Structural), which he followed with structural tech and trade supervisor qualifications.

These days, Trung spends his weekdays working on aircraft – most-recently the C-17A Globemaster – which means quadruple-checking their model-specific structure, skins, pipeline integrity and attachment hardware.

One day he might be using a drone to carry out a paint survey on the top of a plane – the next, drafting detailed technical drawings.

"We're one of the last trades to fabricate aircraft parts locally," he says. "I love being able to work physically, too." – by Cassie Steel

Food for the FUTURE

Defence careers in food and agriculture have a real-world impact

Imagine using food and nutrition science to make sure our military personnel perform at their peak. Or working to ensure the food security of Australia and other nations through scientific research, humanitarian aid or by defending our shipping and trade routes. Sounds pretty rewarding, right?

You may not have even realised that Defence offers careers in food and agriculture, but if you're interested in studying and working in fields like exercise and nutrition, food technology, civil engineering, chemistry or environmental science, plus you want a career that has a global impact and supports our national interests, then this career path might just satisfy that appetite. – by Danielle Lucas

SKILLS SMORGASBORD

ZACHARY IS USING HIS COOKING SKILLS TO KEEP NAVY PERSONNEL NOURISHED – AND COLLECTING LOADS OF QUALIFICATIONS ALONG THE WAY!

After finishing Year 12, Zachary was looking to gain a qualification as a commercial chef – and he got it, plus an extra qualification in fitness, by joining the Navy. Now, Zachary works as a maritime logistics chef, preparing and cooking food for the people on the ship.

In his Navy career, Zachary has been on some really cool deployments, including the world's biggest international maritime exercise: Exercise Rim of the Pacific (RIMPAC) in 2022. Conducted every second year off Hawaii, it includes naval war games at sea, a sports tournament and other events that allow sailors and officers from participating nations to build stronger relationships. Zach loved meeting sailors from other countries with the same job and seeing how they ran their kitchen, aka galley. – by Gemma Chilton

CERTIFICATE IN
COMMERCIAL COOKERY

CERTIFICATE
IN FITNESS

ABLE SEAMAN
NAVY

MARITIME LOGISTICS
CHEF, NAVY

HUNGRY FOR AN EXCITING ROLE?

CATERING OFFICER

Ensure nutritional meals will sustain service personnel across all environments, including soldiers in operational zones.

FOOD TECHNOLOGIST

Use sports and military science to ensure ADF members get the nutrition they need to perform at their peak.

ENVIRONMENTAL AND AGRICULTURAL SCIENTIST

Use cutting-edge tech like UAVs, satellites, spectral cameras and CubeSats to map and model plant growth, crop yields and other plant activity remotely.

BIOFUEL CHEMIST

Explore the use of new biofuels. Could jets, ships and tanks run on fuel from algae or sugar cane? The US Navy has committed to getting 50% of its energy from alternate fuel sources. As an ally, DSTG is working to ensure our own platforms can operate on these fuels for joint exercises.

CIVIL ENGINEER

Provide humanitarian aid during crises and make sure communities have access to essential services like water and electricity.

START YOUR CAREER HERE

DEFENCE + FOOD + AGRICULTURE + STUDY

Bachelor of **Engineering** (Honours) (CDF) (Civil), UNSW (ADFA)

Bachelor of **Exercise and Nutrition Sciences**

Bachelor of **Science** (Environmental Science)

Bachelor of **Science** (Chemistry major)

Certificate IV in **Human Nutrition**

DEFENCE + FOOD + AGRICULTURE + JOBS

Army Catering Officer
\$85,051*

Food Technologist
\$78,653**

Army Civil Engineer
\$90,629*

Navy Communications Operator
\$73,253*

Environmental and Agricultural Scientist
\$76,000**

Research Chemist
\$74,293**

Source: Payscale, Indeed and defencejobs.gov.au/jobs/
* Pay on completion of initial military training and initial employment training.
** Average base salary

ZACHARY
MARITIME LOGISTICS
CHEF, NAVY

ABOVE AND BEYOND

The Defence Force's latest operational domain is space – and you could be part of it!

If you're interested in a future-focused career that's out of this world, a STEM job with Australia's new Defence Space Command should be on your radar.

Established in early 2022, the Defence Space Command brings together experts from the Navy, Army and Air Force, government agencies and private companies, with the joint goal of increasing Australia's space capabilities, ensuring our access to space and promoting global security and a safe space environment.

With a whopping \$7 billion invested in the Defence Space Command over the next decade, there will be no shortage of career opportunities. From designing and launching satellites to working on hypersonic technology and electronic warfare, you'll have the chance to work with some really cool advanced technology. – by Danielle Lucas



MEMBERS OF THE AUSTRALIAN AIR FORCE CADETS ARRIVE AT QUEEN SQUARE PARK, MOONTA, SOUTH AUSTRALIA.



TO INFINITY AND BEYOND – GETTING THERE

- Check individual universities for minimum entry requirements, like prerequisite or recommended school subjects and ATAR cutoffs.
- Follow the application process for the sector of Defence you're applying to – this can include an online application, in-person testing, interviews, physical and medical checks, and security checks.
- Join the military. To attend ADFA as a trainee officer and complete your degree or join other ranks (technical) through general entry, you'll need to complete the Defence Force recruiting process.
- There's a place for you! Defence careers are open to all Australians, regardless of gender, sexuality, ethnic origin or cultural background.

LAUNCH YOUR CAREER

The STEM Cadetship program and the Defence Graduate program are two opportunities offered by Defence public service to students, where you can study and work at the same time, gaining valuable skills and experience. These programs can lead you to exciting roles with the Australian Geospatial-Intelligence Organisation (AGO) or Defence Science and Technology Group (DSTG), working on cutting-edge technical projects like designing and launching satellites or analysing intelligence data.



SECRETARY OF DEFENCE GREG MORIARTY DURING A PRESENTATION TO DEFENCE GRADUATE PROGRAM PARTICIPANTS AT ADAMS AUDITORIUM, AUSTRALIAN DEFENCE FORCE ACADEMY, CANBERRA.

SPACE STAR

JASLYN ALWAYS LOVED SPACE AND TECH. EVEN THOUGH STEM SUBJECTS WEREN'T HER STRONGEST AT SCHOOL. NOW? SHE'S ON HER WAY TO BECOMING A SPACE RESEARCHER

**JASLYN
RESEARCH SCIENTIST
AND ENGINEER, DSTG**

**BACHELOR OF ENGINEERING (HONOURS)
(ADVANCED MANUFACTURING AND MECHATRONICS)**
**PHD CANDIDATE, MECHANICAL
AND AEROSPACE ENGINEERING**
**RESEARCH SCIENTIST
AND ENGINEER, DSTG**
**BACHELOR OF
APPLIED SCIENCE**
**STEM CADETSHIP PROGRAM,
DSTG**

Jaslyn was always fascinated by science, space and technology, and is a big sci-fi fan. However, science wasn't her strongest subject at school. In Year 12, her highest marks were in theatre and English! But that didn't stop her following her dream STEM career path.

"I pursued my passions to study science and engineering at university and now get to do science every day, which is really exciting," she says.

In her final year of uni, she joined DSTG as a Defence STEM Cadet. After graduating, she landed a full-time research position with DSTG's Material Awareness Group. In this role, Jaslyn combines her interests in physics and robotics, working for a "phenomenal" multidisciplinary team, presenting at conferences and helping plan critical space projects for Defence.

Jaslyn is now undertaking her PhD in mechanical and aerospace engineering at Monash University, sponsored by DSTG. For this, she's conducting research into detecting impacts in air and space structures that will be of critical importance to Defence in the near future.

"I feel incredibly privileged to have DSTG sponsoring my PhD full-time and giving me the chance to develop new fundamental research that meets Defence outcomes," she says.

Her advice to those interested in a career like hers?

"Follow your passion and don't let someone tell you that you can't do something. Try it yourself and if it fails, you'll still learn something." – *by Gemma Chilton*

**I GET TO DO SCIENCE
EVERY DAY. WHICH IS EXCITING"**

COSMOS-COOL PROJECTS

Check out some of the exciting innovation projects happening in the Defence space sector:

CUBE SAT MISSION

The M2 satellite mission is a collaborative project between the University of NSW Canberra Space and Air Force. These satellites are testing communications architecture and other satellite technologies built and developed right here in Australia!

SPACE SURVEILLANCE TELESCOPE

The Royal Australian Air Force space surveillance telescope will survey the night skies, detecting and cataloguing objects in geosynchronous orbit (one that matches the Earth's rotation on its axis) more than 30,000km above the Earth. This is a critical band for telecommunications satellites.

**START YOUR
CAREER HERE**

DEFENCE + SPACE + STUDY

Bachelor of
Engineering
(Aeronautical)
(Honours),
UNSW (ADFA)

Bachelor of Aerospace
Systems Engineering
(Honours)

Bachelor of
Technology
(Aeronautical)

Bachelor of
Engineering (Honours)
/ Bachelor of Science

Bachelor of
Mathematics

**Air Force Avionics
Technician** Initial
military training and
Cert IV in Aeroskills
(Avionics)

DEFENCE + SPACE + JOBS

**Air Force Aeronautical
Engineer**
\$90,629*

**Air Force Mission
Controller**
\$80,857*

**Air Force Intelligence
Analyst (Geospatial)**
\$79,555*

**Army Telecoms
Technician**
\$79,452*

**Air Force Avionics
Technician**
\$75,451*

AGO Grad Program
Starting salary of
\$71,207 and APS
Level 4 salary of
\$77,739 on completion

Source: defencejobs.gov.au/jobs/, apsjobs.gov.au/s/
* Pay on completion of initial military training and initial employment training.



CHRIS
AIR SURVEILLANCE
OPERATOR

FIT FOR ACTION

FIRST NATIONS AIR FORCE SURVEILLANCE OPERATOR CHRIS STARTED OUT AS A PERSONAL TRAINER. BUT NOW FLEXES HIS SKILLS MID-AIR, PROTECTING OUR SKIES

Chris comes from a linguistically diverse background, identifies as a proud First Nations person and is passionate about shaking up stereotypes.

"Coming from a warrior race, every time I step into the operations room I feel like I'm doing my family and past generations proud," he says. "I'm changing the narrative and I hope to lead other First Nations youth into Defence."

After school, he channelled his love of sport and fitness into working as a personal trainer, before applying for a role as a trainee surveillance operator in the Air Force.

SECRETS OF THE SKIES

On an average day, Chris works on secret missions using a network of radars and intelligence systems to direct, categorise and identify aircraft and service vessels in designated operational zones.

As with any future-proof gig, STEM skills are key.

"At first it was daunting going into a STEM role, as my skills weren't as strong as they could be, but I've been able to strengthen them," says Chris. "Maths in particular is necessary for tasks like calculating aircraft speeds and how much fuel an aircraft requires."

"In Defence, there are a lot of resources to support you and get you to where you want to be." — by Cassie Steel

CERTIFICATE III AND IV
IN FITNESS



PERSONAL
TRAINER



AIR SURVEILLANCE OPERATOR.
AIR FORCE

HELICOPTER HERO

CATHERINE GERRARD HAS TAKEN A LIFELONG INTEREST IN STEM TO NEW HEIGHTS IN DEFENCE



**CATHERINE
TRAINEE AVIATION
ENGINEER**

ENGINEERING WORK EXPERIENCE.
BHP MITSUBISHI ALLIANCE

BACHELOR OF
ENGINEERING (HONOURS)

ARMY AVIATION
ENGINEERING OFFICER. ADF

ARMY AVIATION ENGINEERING
OFFICER TRAINING CONTINUUM

Catherine's love of sound and lighting in school musicals and theatre productions sparked her interest in becoming an engineer.

She studied mechanical and aerospace engineering at uni and was drawn to Defence by the huge role they play in Australia's aerospace industry – and the perks.

"My friend told me about the Defence University Sponsorship program, where the ADF pays for your degree and you earn a salary while you study," she explains. "I applied through Defence Force Recruiting and was lucky enough to be offered an undergraduate sponsorship position."

Catherine is now a trainee engineer, shadowing senior engineers at the Army's combat aviation unit, which houses the Eurocopter Tiger armed reconnaissance helicopter. She gives engineering advice about maintenance issues, coordinates scheduled maintenance and conducts technical investigations following incidents on aircraft.

The best part of her job?

"You get to work with interesting equipment and travel to places that you wouldn't get with a normal engineering office job. I'm really looking forward to learning about all the cool emerging technologies I could work with in the future." – by Louise Meers

PROBLEM SOLVER

FLIGHT LIEUTENANT SARAH USES HER STEM SKILLS EVERY DAY TO WORK OUT HOW TECH CAN HELP DEFENCE

Sarah never saw herself working in Defence, despite her dad being in the Air Force, but realised it could offer the variety she wanted in a career: "I wanted the ability to work with different technologies in different environments and change my role every few years."

After studying engineering at uni, Sarah undertook officer training and began working in Air Force engineering. In her current role in Space Force Design and Integration, she analyses various capabilities that Defence has and finds ways to better meet the operational needs of the military.

"It's not often in engineering you get to both develop a need and find the solution. Usually you get given one or the other, so I am really enjoying that," she says.

In her last role, Sarah even worked on a space-based missile warning network: "The technology is amazing. I loved working with it and learning as I went."

Her advice for anyone considering STEM and Defence? "Don't be scared of doing what you enjoy and changing things up when you want a change." – by Louise Meers



**SARAH
DEFENCE ENGINEER.
AIR FORCE**

DEPLOYMENT TO THE MIDDLE
EAST ON OP ACCORDION

MASTERS IN PROJECT
MANAGEMENT

OFFICER TRAINING
SCHOOL

BACHELOR OF
ENGINEERING (HONOURS)

AUSTRALIA DAY ACHIEVEMENT AWARD
FOR EXCELLENCE IN SUSTAINING AUSTRALIA'S
SPACE DOMAIN AWARENESS CAPABILITIES

**DON'T BE SCARED OF
DOING WHAT YOU ENJOY**

Super positions

From secure positioning and navigation systems to magnetic camouflage for tanks, Australian Defence scientists are leading the quantum charge

Over the next decade, the Defence Science and Technology Group (DSTG) will spend \$1.2 billion to develop quantum technology in applications such as sensing, navigation and communications as a priority area of their Next Generation Technologies Fund, which will develop high-tech solutions for the “future Defence Force after next”.

The fund has already paid for some very cool projects. These include researching whether quantum radar can lock onto stealth aircraft, using lasers or tiny diamonds to sense metal objects through walls or track submarines, and a super-precise portable atomic clock that ticks three trillion times per second!

As well as helping keep our Defence Force safe and in top form, these technologies can also be applied to applications including geo-exploration, vehicle and smartphone navigation systems. – *by Nadine Cranenburgh*



LIEUTENANT COLONEL PHILIPPA LOOKS THROUGH A REALWEAR AUGMENTED REALITY HEADSET AT THE ARMY ROBOTICS EXPO AND QUANTUM TECHNOLOGY CHALLENGE.

PTE JACOB HILTON

SECURE POSITIONING

GPS is more than a handy way to find your way from A to B. In Defence, the US-run satellite positioning system is the key to precise military manoeuvres, navigation and guided weapon targeting. If GPS is lost or jammed, there is no alternative system to keep our Defence Force on track.

The loss of GPS could be due to factors including cyber attacks by hostile forces or poor satellite reception when operating underwater, underground, in the mountains or in dense cities.

DSTG is working on a project to combine emerging quantum tech with conventional positioning to make sure Defence has access to accurate positioning and navigation data at all times.

More info here: youtu.be/Ct2LVfUWlma

LEVELLING UP WITH QUANTUM

Here are some of the ways quantum technology can supercharge applications in Defence and beyond.

Materials: Quantum microscopes and nanosensors could help develop innovative materials to improve Defence operations as well as medical technology.

Navigation and communication: Quantum technology will be more stable and precise than existing tech, which will improve the speed and accuracy of digital communications and navigation systems.

Human machine interfaces: Can you imagine controlling a stealth aircraft with your mind? Quantum magnetometers could make it happen by providing advanced brain activity imaging through wearable devices.



AUSTRALIAN ARMY SAPPER ISAAC FROM THE 3RD COMBAT ENGINEER REGIMENT TESTS THE RANGE OF A SQUAD-PACKABLE UTILITY ROBOT DURING THE TRIAL PHASE AT LAVARACK BARRACKS, QLD.

SHUTTERSTOCK

DEFENCE + QUANTUM + STUDY

Bachelor of **Science (Honours)**

Bachelor of **Philosophy (Honours)**

Bachelor of **Engineering (Materials Science) (Honours)**

Bachelor of **Engineering (Electrical and Computer Systems) (Honours)**

DEFENCE + QUANTUM + JOBS

Defence Graduate Researcher

APS Level 4.

Training salary starts at \$65,133, on graduation \$71,109

Source: apsjobs.gov.au/s/

AUSTRALIAN ARMY SOLDIERS **CORPORAL CLAUDIO** AND **TROOPER AARON** AT THE 10TH LIGHT HORSE REGIMENT DISPLAY OF THE ARMY QUANTUM TECHNOLOGY CHALLENGE AT THE CHIEF OF ARMY SYMPOSIUM (CAS) 2022.

QUANTUM STEALTH

The annual Army Quantum Next Generation Challenge gives university students, researchers and talented Army personnel the opportunity to devise and pitch innovative applications of quantum tech.

In 2021, the challenge was to protect soldiers and equipment from detection by a highly accurate drone-mounted quantum magnetometer. Solutions included using the Earth's magnetic field as camouflage and decoy magnetic field generators. A team from QUT devised the winning concept – a magnetic field generator to keep an Army tank safe by reducing its magnetic signature on the fly.

The Army's Quantum Technology Roadmap lays out future plans for quantum tech, including developing the top solutions discovered in the innovation challenges and supporting their implementation in the field.



SOTRISTAN KENNEDY

QUANTUM PATHWAYS

To become a quantum Defence researcher, you'll need an Honours or Masters degree in science, electrical engineering or materials science. After uni, you can apply for the Research and Innovation Pathway of the Defence Graduate Program. Over 12 months it involves two rotations in DSTG, the ADF or Defence industry, in roles that could include a quantum project or lead to a project working in quantum technologies. You could also look out for opportunities to partner with Defence through PhD or postgraduate projects.

LASER FOCUS

A FASCINATION WITH NATURAL PHENOMENA LED **DR ALEXANDER** INTO SCIENCE AND HE NOW USES QUANTUM PHYSICS AND HIS CHEMISTRY SKILLS IN DEFENCE

Always wanting to know the 'why', 'what' and 'how' behind everything, Alexander was drawn to chemistry and physics.

After studying science at uni and working in academia, he wanted to apply his STEM skills elsewhere.

COLLABORATE AND LISTEN

As NAVIGATE Science Advisor for DSTG, Alexander develops collaborative research projects between Defence, academia at the DualTech Ultrashort and Short Pulsed Laser (DualTech-USPL) facility at the University of Adelaide, which develops and builds laser tech.

Drawing on his laser spectroscopy skills, he studies how light interacts with matter.

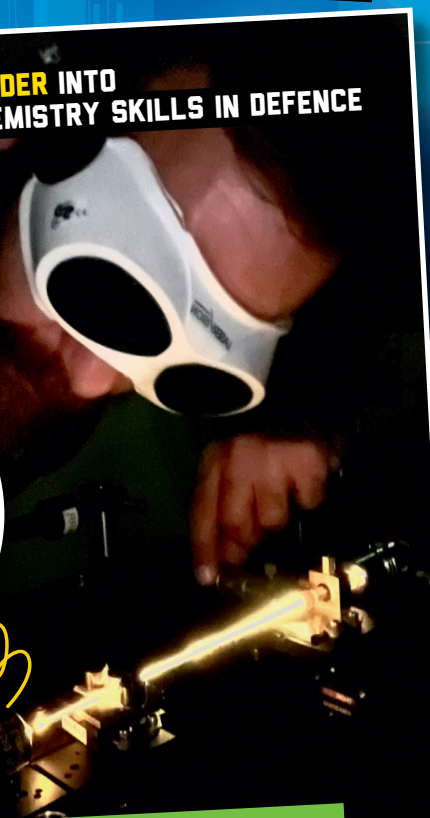
"This is a fancy way of saying that I blast molecules with lasers and watch what happens!" he explains. "Understanding observations from these experiments involves performing complex calculations that rely on quantum physics."

Alexander's advice? "Talk to as many STEM and/or Defence professionals as you can to learn about all of the exciting opportunities out there."

– by Louise Meers



ALEXANDER
NAVIGATE SCIENCE
ADVISOR. DSTG



TALK TO AS MANY STEM AND/OR DEFENCE PROFESSIONALS AS YOU CAN

BACHELOR OF SCIENCE (HONOURS) (CHEMISTRY)

PHD IN CHEMICAL SCIENCES

POSTDOCTORAL RESEARCH ASSOCIATE

RESEARCH ASSOCIATE

NAVIGATE SCIENCE ADVISOR. DSTG

Ready for a sea change?

It's an exciting time for Australian ships and submarines, with plenty of in-demand careers on offer

Whether designing submarines and warships or keeping weapons, propulsion systems and information systems fighting fit, there are heaps of ways to put STEM skills to work in a marine career within Defence. There's something for everyone, from IT to trade and engineering roles, and cutting-edge research.

Under the National Naval Shipbuilding Enterprise, the Australian Government is

committed to spending up to \$183 billion to create a secure and sustainable local shipbuilding industry. This will ensure upgraded facilities and a continuous stream of projects – creating secure STEM jobs for young Australians keen to try out a Defence career.

This includes Navy careers as well as research, general trades, education and training, logistics and so much more. Interested? Head to the Naval Shipbuilding College website and check out the free 30-minute taster course to get started.

MARINE CAREERS - NAVY

LIFE AT SEA

Working on a warship or submarine is not your usual 9-to-5. You'll learn skills outside your main role, including medical support and seamanship. You may also work in shifts or 'watches'. When you're 'off watch', you can relax and catch up on video games or exercise (there are onboard gyms), watch a movie or email your family. Going ashore to catch up with friends or experience new countries and cultures is also a highlight.

There are many pathways into a Defence marine career. Check these out:

Naval architect

Highly specialised engineers who design, build and keep seagoing vessels up to spec. A good first step is studying a Bachelor of Engineering (Naval Architecture) at UNSW (ADFA).

Navy marine or electronic technician

Navy trades maintain and operate the electronic, weapons, communications, navigation, control and propulsion systems of ships and submarines. Sign up for full training and great conditions while earning a wage.

Navy communications and information systems operator

If you're interested in frontline cyber security, network admin or managing encrypted communications, this high-priority role may be for you. Learn on the job and get paid as you go.

Going nuclear

In 2021, the Australian government made the decision to invest in a fleet of nuclear-powered submarines and started the National Nuclear Powered Submarine Taskforce. A priority for Defence is upskilling the nuclear submarine workforce of the future. This includes uni scholarships of up to \$20,000 per year for four years (or the rest of your degree) if you're studying an engineering or physics course.

If you're at uni, you can also apply for the Defence STEM Cadetship program. You'll build real-world skills in 60 or more days of paid Defence work placements each year and get assistance with uni expenses and HELP payments as well. At the end of your degree, you'll have a full-time Defence job in an exciting new field.

– by Nadine Cranenburgh

Afloat in cash!

There are university scholarships of \$20,000 a year for up to four years, available from 2023 to 2027, to encourage undergraduate students to continue in STEM disciplines relevant to nuclear science and engineering. Looking for more info? Check out:

defence.gov.au
/NPSTF

MARINE CAREERS - APS

MAXIMUM PERFORMANCE

DSTG works on cool science and technology projects like undersea combat and surveillance, nuclear subs and remote undersea surveillance. Working as a STEM grad at DSTG is your ticket to keeping the Navy's current and future fleet safe and operating at its peak. Here are some of the roles on offer:

Naval architecture and system analysis

Work on cutting-edge scientific analysis and naval architecture assessments to make sure current and future ships, submarines and automated vessels perform to the Navy's high standards.

Materials and structural integrity

The sea exerts massive pressure on vessels, particularly submarines. If you have a passion for computer modelling and simulation, you can help improve structures to keep sailors safe.

Power and energy systems

There's more to naval vessels than metal hulls! Put your mechanical or electrical engineering skills to work on generation, battery storage and propulsion tech.

Ship survival

Can you rise to the challenge of improving how the Navy fleet performs when faced with weapon attacks, extreme weather and sea conditions, fire and smoke?

**DEFENCE +
MARINE
+ STUDY**

Bachelor of
**Engineering (Naval
Architecture)**
(Honours), UNSW
(ADFA)

**Royal Australian
Naval College**

**Naval Shipbuilding
College**

Bachelor of **Science**

Bachelor of
Engineering
(Mechanical)

Bachelor of
Engineering
(Electrical and
Computer Systems)

**DEFENCE +
MARINE
+ JOBS**

**Marine Technician
Submariner**
\$88,437*

**Mechanical
Engineer**
\$100,845*

**Electronics
Engineer
Submariner**
\$106,884*

Naval Architect
APS Level 4,
\$71,207–\$77,739

Systems Engineer
APS Level 4,
\$71,207–\$77,739

**APS STEM Cadet
(Nuclear Science)**
Trainee salary
starts at \$50,608
(pro rata), then
APS Level 4 at
\$71,207–\$77,739

Source: defencejobs.gov.au,
apsjobs.gov.au/s/

* Pay on completion of initial
military training and initial
employment training

HMAS PERTH RETURNS HOME TO FLEET BASE WEST FROM AN EXTENDED PERIOD OF MAINTENANCE AND UPGRADES AT THE AUSTRALIAN MARINE COMPLEX AT HENDERSON IN WESTERN AUSTRALIA.

FIGHTING FIRE WITH FIRE

WHEN LIEUTENANT **LORETTA** ISN'T FIGHTING FOR OUR COUNTRY AS A MARINE ENGINEER, SHE'S VOLUNTEERING TO FIGHT FIRES

After studying mechanical engineering at uni, Loretta wanted a career that was exciting and outside the realms of a regular office job. Not one to do anything by halves, she decided to join the Navy and also became a volunteer firefighter.

Now, as a deputy marine engineer officer, Loretta is in charge of making sure all the machines and equipment on a Navy ship are running smoothly. She also manages the fuel and water onboard.

Throughout her career, Loretta has used her STEM skills to solve problems and make important decisions. One of the most meaningful jobs she has undertaken was making sure a ship was fixed and ready to go back to sea.

MAKING A DIFFERENCE

Her volunteer firefighting work has also been incredibly meaningful, having responded to more than 600 incidents and even fighting the Black

I HAVE ACHIEVED THINGS BEYOND WHAT I THOUGHT WAS POSSIBLE FOR MYSELF

Summer bushfires of 2019-2020. During that period, she served as a leader on multiple teams and, despite the difficult nature of the work, she says it was valuable being able to put her skills into practice and then take them back to her Navy role.

"Having a prior knowledge of fire behaviour, firefighting techniques and equipment has assisted in my role within the damage-control organisation on a Navy vessel," she says.

Loretta says her experiences have taught her that she can do more than she ever thought possible and she is excited about promoting diversity in her organisations and mentoring both future female firefighters and Navy members to step outside their comfort zones: "The experience has taught me that I am very capable and have achieved things beyond what I thought was possible for myself." – by Gemma Chilton

LORETTA
MARINE ENGINEER,
NAVY

VOLUNTEER FIREFIGHTER

DEPUTY MARINE ENGINEER, ROYAL AUSTRALIAN NAVY

BACHELOR OF ENGINEERING (MECHANICAL)

DREAM JOB

A NAVY GAP YEAR INTRODUCED **ANDREW** TO THE JOB OF MARINE TECHNICIAN – AND HE HASN'T LOOKED BACK

ANDREW
MARINE TECHNICIAN,
NAVY

IT'S LIKE WATCHING AN ACTION-PACKED MOVIE, BUT YOU'RE ONE OF THE MAIN ACTORS"

CERTIFICATE II
IN ENGINEERING

CERTIFICATE III IN
ELECTRICAL FITTING

MARINE TECHNICIAN SUBMARINER,
ROYAL AUSTRALIAN NAVY

As a marine technician submariner, Andrew is responsible for making sure the Australian Navy's submarines run smoothly, always keeping an eye on the systems and doing maintenance to ensure everything is safe and working properly.

Andrew wasn't sure what he wanted to do after high school, so he took a Navy Gap Year – a 12-month paid program that offers a taste of Navy life – and discovered the marine technician field, which he found interesting because it was hands-on and similar to an industrial electrician, a gig he was already interested in. Through the Navy, Andrew also got his electrical fitter's licence, so he has something to fall back on.

SUB-TACULAR EXPERIENCE

One of the most exciting experiences Andrew has had was diving and surfacing a submarine.

"Being in control of the systems we use to dive the submarine and then making reports on the state of the systems to the captain is a pretty surreal feeling," he says. "Everyone takes it very seriously and it's like watching an action-packed movie, but you're one of the main actors."

Andrew thinks he's hit the jackpot with his Navy career: "You get a very competitive salary while learning a trade, you get to work on a wide variety of equipment, you meet some awesome people and have amazing experiences that a lot of people could only dream of."

– by Gemma Chilton

STANDING FOR EXCELLENCE

COMBAT SYSTEMS OPERATOR **MONIFAH** GREW UP ON A REMOTE AUSTRALIAN ISLAND AND JUMPED INTO A DEFENCE ROLE TO BREAK OUT OF HER COMFORT ZONE

MONIFAH
COMBAT SYSTEMS
OPERATOR, NAVY

Growing up on a remote island, Monifah didn't have a STEM background and initially thought she wouldn't enjoy using technology, but says, "After seeing what jobs I could get into at Defence, I thought it would be great to try a job that was out of my comfort zone".

As a combat systems operator, Monifah uses sonar and radar to detect and track surface or subsurface vessels and ensure Navy command is aware of its surroundings: "It's about knowing what's going on at all times, as we are tracking and monitoring our whereabouts in the world."

Monifah is also a recruit instructor for the Navy Indigenous Development Program and says bringing her cultural perspective to Defence is a key part of what makes Defence better.

"Every culture sees the workplace in a different view, so we will all have different levels of knowledge and perspective on things. When shared, the outcome will not only be fair but it will be the best outcome for everyone." – by Heather Catchpole

EVERY CULTURE
SEES THE WORKPLACE IN
A DIFFERENT VIEW"

NAVY RECRUITMENT
AND MILITARY TRAINING

EMPLOYMENT
TRAINING

LEADING
SEAMAN

RECRUIT
INSTRUCTOR

COMBAT SYSTEMS
OPERATOR

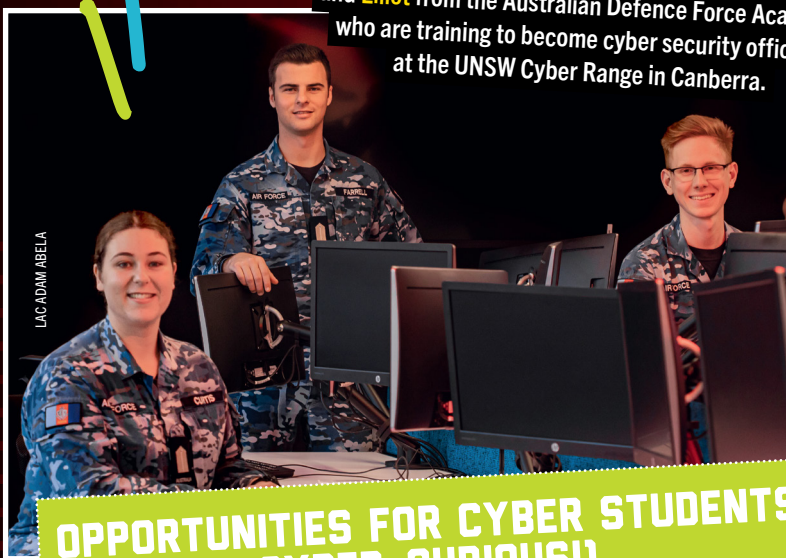
ON THE DIGITAL FRONTLINE

Technology connects us all, but also makes us vulnerable to cyber attacks. That's why Defence needs people with super cyber skills!

Defending our country used to be all about land, sea and air. But the digital age has changed all that. Now, threats can also find us online. In 2022, we saw some huge hacks targeting companies like Optus and Medibank – so Defence takes cyber security very seriously.

In 2017, Defence formed the Information Warfare Division (IWD) to combat digital threats to Australia's interests. Information warfare – also called cyberspace or electronic warfare – is all about using computer networks to attack the other side. This can include the theft of sensitive

Air Force officer cadets (L-R) **Josephine, William and Elliot** from the Australian Defence Force Academy, who are training to become cyber security officers, at the UNSW Cyber Range in Canberra.



LAC ADAM ABELA

OPPORTUNITIES FOR CYBER STUDENTS (AND THE CYBER-CURIOUS!)

The ADF's Cyber Gap Program gives uni and TAFE students the chance to work with mentors, learn new skills, complete challenges, attend the Defence Cyber Conference and more! You can be studying any cyber qualification from Cert III up, and the best bit is they'll even pay your course fees for the year! More information at bit.ly/DefenceCyberGap

ASD CyberEXP is another cool resource. This interactive online experience puts you in the shoes of a cyber professional responding to a real-life scenario. It's free and anyone can have a go! ASD also offers summer internships for uni students, as well as high school work experience placements, at the Australian Cyber Security Centre.

Research roles

The world of cyber warfare is always changing. To help us keep up, researchers are busy working behind the scenes on the latest technology. For example, DSTG developed a technology called Shapes Vector that can analyse the security of large computer networks.

The Australian Defence Force Academy (**ADFA**) also does important cyber research. It's one of the two campuses of the UNSW Institute for Cyber Security (**IFCYBER**). If a research career is on your radar, it could be here!

GRADUATE PATHWAYS

Another way to have a career in cyber and Defence is through the Australian Public Service.

The Defence Graduate Program has different pathways all looking for cyber skills, including technical, intelligence and research and innovation pathways – so take your pick!

There's also the digital and intelligence streams of the Australian Government Graduate Program. This could get you in the door at one of the 10 departments and agencies that make up the National Intelligence Community.

information, blocking signals or taking control of infrastructure via a network. The IWD brings together the Australian Defence Force in a united effort to protect against these attacks.

Army signals officers, Navy information officers and Air Force cyberspace warfare officers lead technical teams and create plans for successful missions. Cyber analysts employ their digital forensics skills and knowledge to help detect, prevent and fight cyber attacks.

At the operational level, network technicians and systems operators keep everything running smoothly so that missions can be completed. It's all part of a day's work as a Defence service member! – by Chloe Walker

WHERE COULD YOU WORK?

**AUSTRALIAN SIGNALS
DIRECTORATE (ASD)**

**DEFENCE SCIENCE +
TECHNOLOGY GROUP
(DSTG)**

**DEFENCE INTELLIGENCE
ORGANISATION (DIO)**

**AUSTRALIAN
GEOSPATIAL-
INTELLIGENCE
ORGANISATION (AGO)**

**DEFENCE'S CHIEF
INFORMATION OFFICER
GROUP (CIOG)**

**OFFICE OF NATIONAL
INTELLIGENCE (ONI)**

PATH FINDER

**CATISHA IS USING HER TRANSFERABLE SKILLS IN MATHS
AND STATS TO HELP KEEP OUR DEFENCE FORCES CYBER-SAFE**

Growing up, Catisha was fascinated by science and maths. She knew she wanted a career in STEM, so she studied biochemistry and statistics at university. But when she graduated, she wanted to try something new and "tackle real-life problems". That's when she found the DSTG graduate program and it was the perfect fit.

Now, as a communications science specialist at DSTG, she analyses computer network data to identify cyber security problems and help address them.

"I love my role because I have the opportunity to learn lots of new skills and tackle lots of different problems, and feel like I'm making a difference," says Catisha.

One of her favourite projects so far has been working with machine learning – a field she'd never explored before joining DSTG: "It has been a lot of fun to learn and develop new skills in a research area that is developing so rapidly."

Catisha's advice for anyone interested in pursuing a Defence career?

"Always be willing to try something new! You never know what might become a new passion."

She's also a big fan of sticking with maths to broaden your STEM career horizons: "Learning as much mathematics as you can in both high school and university is a great way to keep your options open." – by Gemma Chilton



**CATISHA
COMMUNICATIONS
SCIENCE
SPECIALIST, DSTG**

**ALWAYS BE WILLING
TO TRY SOMETHING NEW! YOU
NEVER KNOW WHAT MIGHT
BECOME A NEW PASSION"**

**BACHELOR OF SCIENCE (BIOCHEMISTRY AND
STATISTICS), UNIVERSITY OF ADELAIDE**

**DEFENCE GRADUATE PROGRAM
(RESEARCH AND INNOVATION PATHWAY), DSTG**

**MASTER OF PHILOSOPHY (BIOINFORMATICS),
UNIVERSITY OF ADELAIDE**

**COMMUNICATIONS SCIENCE
SPECIALIST, DSTG**

DEFENCE + CYBER SECURITY + STUDY

Bachelor of
**Computing & Cyber
Security**, UNSW
(ADFA)

Bachelor of
**Computer Science
(Cyber Security)**

Bachelor of **Science
(Cyber Security)**

Bachelor of **Software
Engineering (Cyber
Security)**

Certificate IV in
Cyber Security

DEFENCE + CYBER SECURITY + JOBS

Navy Cyber Operator
\$79,452*

**Navy Information
Warfare Officer**
\$80,857*

**Air Force
Cyberspace
Warfare Analyst**
\$79,555*

**Air Force Network
Technician**
\$75,451*

**Army Electronic
Warfare Operator**
\$79,452*

Army Cyber Analyst
\$79,452*

**APS Cyber Security
Researcher**
APS Level 3,
\$62,863–\$69,265

**ASD Cyber
Security Analyst**
ASD Level 4,
\$71,919–\$98,768

Source: defencejobs.gov.au/
jobs.apsjobs.gov.au/s/

*Pay on completion of initial
military training and initial
employment training

FRONTIERS OF THE FUTURE

Staying ahead of the technology game is critical for Defence and skills in tech like AI and robotics could give you the cutting edge

Forget teaching Fido to sit, stay and fetch – the Army has mind control for its robotic dogs.

Two sergeants recently tested some tech developed by the University of Technology Sydney (UTS) that allowed them to operate a robot using augmented reality goggles and sensors that detected their brain waves. By concentrating on flickering shapes on the screen, they could tell the robot where to go.

Testing out cool tech like this is in a day's work in Defence. And it's a team effort, with researchers from Defence Science and Technology Group (DSTG), universities and even startups working closely with people from Navy, Army and Air Force to find ways to improve Defence's capabilities.

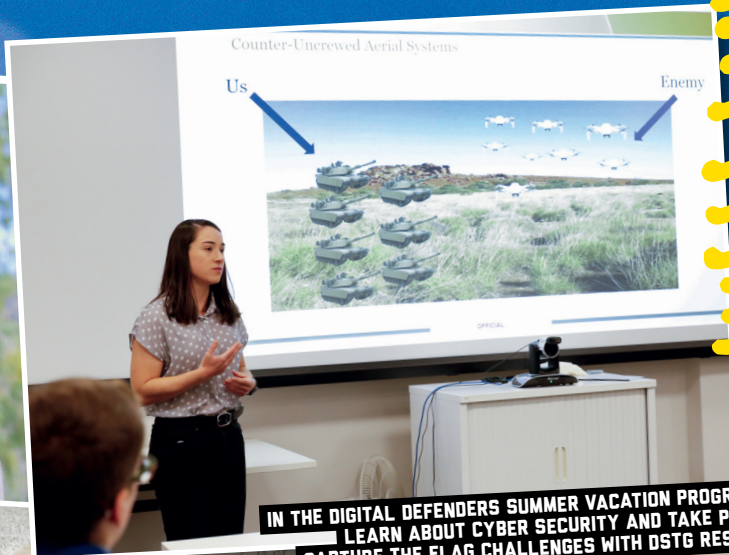
The new wave

Technology like artificial intelligence (AI), robotics, autonomous systems and machine learning could transform the way Defence operates. It's all about making things faster, smarter and safer – as well as getting an edge over competitors.

The Navy recently tested 40 autonomous vehicles that can roam the ocean surface, under the sea or through the sky to help detect dangers or gather intelligence.



AUSTRALIAN ARMY CRAFTSMAN **SEAN**, FROM THE 3RD BATTALION, ROYAL AUSTRALIAN REGIMENT RECEIVES INSTRUCTION FROM **MAJOR ASHLEY** DURING THE ARMY HEADQUARTERS ROBOTIC DEMONSTRATION AT LAVARACK BARRACKS



IN THE DIGITAL DEFENDERS SUMMER VACATION PROGRAM, STUDENTS LEARN ABOUT CYBER SECURITY AND TAKE PART IN CAPTURE THE FLAG CHALLENGES WITH DSTG RESEARCHERS.



They're also developing a robot submarine called Ghost Shark – best name ever! – that can lurk under the sea for long periods of time and travel long distances.

Meanwhile, Air Force analysts are using AI to sort through huge amounts of intelligence data and training it to detect and track targets of interest. They're also investigating how AI can help people make smarter, faster decisions in risky situations. And the Australian government recently invested \$10 million in developing AI tech for Defence, so there's more to come!

With the right skills, a career in Defence could have you competing in a robot battle aboard a Navy ship, checking out the latest self-driving vehicles at the Army Robotic Expo or using a digital twin – a virtual model that accurately reflects a physical object – to test new systems in the Air Force.

Back at the lab

Behind all the excitement of trialling new tech, there are heaps of dedicated researchers bringing it to life. DSTG is where Defence research happens, including cutting-edge

projects involving autonomous systems like air and sea drones, as well as AI and robotics.

There's also loads happening in unis around Australia, especially at ADFA, which is home to the UNSW Canberra Artificial Intelligence Hub, where more than 80 researchers tackle AI from every angle, from tech to ethics.

Get the skills

The Bachelor of Engineering (Mechanical) at UNSW (ADFA) offers streams in both AI and robotics and autonomous systems, so your tech passions are sorted whether you want to join active service or stay in civvies.

Be a digital defender!

Interested in cyber security? Check out DSTG's Digital Defender program!

Every week, you'll learn from a range of cyber specialists, with training covering everything from scripting to cryptography and digital forensics. At the end, everyone competes in a Capture the Flag challenge to see who is the ultimate cyber protector.

If you're lucky, you might even go behind the scenes at a Defence research facility to check out some top-secret stuff. For more, email digital.defenders@defence.gov.au – no secret password required!
– by Chloe Walker

START YOUR CAREER HERE

DEFENCE + ROBOTICS + AI + STUDY

Bachelor of Science (Computer Science), UNSW (ADFA)

Bachelor of Computing & Cyber Security, UNSW (ADFA)

Bachelor of Engineering (Honours) (Mechanical), UNSW (ADFA)

Bachelor of Artificial Intelligence

Bachelor of Information Technology (Artificial Intelligence and Autonomous Systems)

Bachelor of Information Technology (Machine Learning)

Bachelor of Engineering (Mechatronics)

DEFENCE + ROBOTICS + AI + JOBS

Army Mechatronic and Electrical Engineer \$90,629*

Air Force Electronics Engineer \$87,989*

Navy Drone Mission Commander \$91,260*

APS AI researcher APS Level 3, \$62,863–\$69,265

Computer programmer \$69,991**

Mathematician \$71,885**

Source: defencejobs.gov.au/jobs/, apsjobs.gov.au/s/, payscale.com.au

*Pay on completion of initial military training and initial employment training
**Average base salary

AI EXPERT

KIOWA IS A PROUD DJA DJA WURRUNG WOMAN USING HER TECH EXPERTISE TO HELP DEFENCE SCIENTISTS

Almost every scientist on the planet needs to use computers, but not all scientists are computer experts. That's where Kiowa comes in. As a digital science migration engineer at DSTG, she uses her AI and supercomputing skills to help scientists solve problems.

"I love this job because I get to work with scientists from every background, which means I'm always learning something new!" she says.

Although tech might be her 9-5 these days, Kiowa wasn't always sure she'd work in STEM.

"I love making art, writing poetry and I also loved studying philosophy at university," she says. "When I realised that being creative and communicative was a really important part of STEM, I felt like it was the right place for me."

She studied maths at uni and says this made it easier for her to understand computers and scientific problems. And as for working in Defence? She chose it so she could learn from

the many clever people who work there:

"There is a lot of support to grow and learn in Defence, whether that's trying out a new job, going back to university or just having a chat with someone interesting."

Kiowa says she's only ever met one other Aboriginal woman working in tech – and changing that situation is important to all her Defence co-workers.

"Being diverse means I'm extra-interested in listening closely to different perspectives and ensuring everyone is included, which means we can learn more from the people we work with and create solutions which work for as many different people as possible," she says.

Kiowa believes there's a job for everyone in Defence and recommends soaking up as much knowledge as possible: "Don't be afraid to attend a career day and ask lots of questions about the careers that might interest you."

– by Louise Meers

KIOWA
DIGITAL SCIENCE
MIGRATION ENGINEER (AI). DSTG

THERE IS A LOT OF SUPPORT TO GROW AND LEARN IN DEFENCE"

BACHELOR OF
ARTS/SCIENCE

SCIENTIFIC COMPUTING
CADET, CSIRO

HIGH PERFORMANCE COMPUTING
CONSULTANT, MONASH UNIVERSITY

DIGITAL SCIENCE MIGRATION
ENGINEER (AI). DSTG

MASTERS IN CYBER SECURITY AS A RECIPIENT
OF AN ATSE ELEVATE LEADERSHIP SCHOLARSHIP

ROBOT WRANGLER

PETER KNEW HE WANTED A CAREER THAT INVOLVED CREATIVITY AND PROBLEM SOLVING – AND HE FOUND IT IN A COOL ROBOTICS GIG

As a kid, Peter was interested in problem-solving, whether it was in games or his studies. He realised working in STEM was perfect for him as it's "filled with problems waiting to be solved with logic and creativity".

He went on to do a double degree in electronic engineering and computer science, which landed him a job at DSTG, where he now "writes code to make robots work and extract information from them".

Specifically, Peter builds prototype robots and programs to detect faults and damage in all kinds of materials. One of the things he loves most about his job is that he learns something new on every project.

"I get to know 'just enough to be dangerous!'" he jokes.

Peter chose Defence because he wanted to work on projects that help other people. He says he's super grateful for the support of his team, who have helped him feel welcome and that his ideas are always heard.

One of Peter's favourite projects has been working on something called 'line scan thermography robots'.

"We built a ground robot from scratch, programmed it to drive in a straight line... We also programmed it to drive in anything but a straight line, just to see what would happen," he says, adding that it won the team the Best Paper award at a conference.

Peter's top career tip? "Never give up, keep learning and enjoy the journey." – by Gemma Chilton



PETER
SYSTEMS INTEGRATION
SPECIALIST, DSTG

**NEVER GIVE UP, KEEP LEARNING
AND ENJOY THE JOURNEY**

SYSTEMS
INTEGRATION
SPECIALIST, DSTG
GRADUATE,
DSTG
INDUSTRY EXPERIENCE
PLACEMENT PROGRAM,
DSTG
BACHELOR OF COMPUTER
SCIENCE (HONOURS)/ELECTRONIC
ENGINEERING (HONOURS)

DATA DRIVER

KATIE WANTED TO BECOME AN AEROSPACE ENGINEER UNTIL SHE DISCOVERED HER TRUE PASSION – NOW SHE WORKS AS A DATA SCIENTIST AT DSTG USING CUTTING-EDGE TECH LIKE MACHINE LEARNING EVERY DAY

Katie's love of STEM started in high school and she signed up for a double degree in aerospace engineering and maths and data, with plans to become an aerospace engineer. But while she was at uni she found her true passion lay in maths and data, where she felt she could better use her creativity and skills.

Then, before she graduated, Katie became part of the first intake of DSTG's STEM Cadetship Program.

"This gave me insight into how the skills I was learning could be utilised to inform real-world problems while I was still at university, and gave me the peace of mind of a job at the end of my degree," she says.

Katie now works at DSTG as a data scientist, helping build tools that use data science, visualisation, simulation and machine learning to predict the future of the Defence workforce: "I use modelling and simulation to inform long-term, high-impact decisions," she says. "A key part of my work on this project is in visualisation

and natural language generation, where I translate complex mathematical models and simulations into clear, understandable recommendations using state-of-the-art machine learning and data science techniques."

Katie has struggled at times with confidence, but credits the supportive environment at DSTG with helping her work through this. She also recently took advantage of DSTG's Science and Technology Education Initiative to begin her Masters.

Her advice for anyone considering a STEM career? "Just because you struggle with one subject or area doesn't mean STEM is not for you," she says. "There is always help in the form of work colleagues, friends and mentors." – by Gemma Chilton



KATIE
DATA SCIENTIST,
DSTG

BACHELOR OF MECHANICAL
AND AEROSPACE ENGINEERING
(FIRST CLASS HONOURS)

BACHELOR OF MATHEMATICAL
AND COMPUTER SCIENCES

STEM CADET,
DSTG

DATA SCIENTIST,
DSTG

ENGINEERING IS WHAT? (ELEMENTARY!)

Defence engineers working with Questacon have classrooms buzzing across Australia

The Engineering is Elementary program uses hands-on activities to build primary school teachers' skills and knowledge to bring their STEM teaching to life. These free workshops are delivered by Questacon, The National Science and Technology Centre, and supported by Defence until 2027.

Through these workshops, educators are empowered to enable their students to learn engineering through fun activities, such as learning chemical engineering by playing with playdough or sustainable engineering by building a solar oven.

Each workshop focuses on an engineering challenge. Defence engineers help to bring these challenges to life by participating in the workshops and sharing their real world experience.

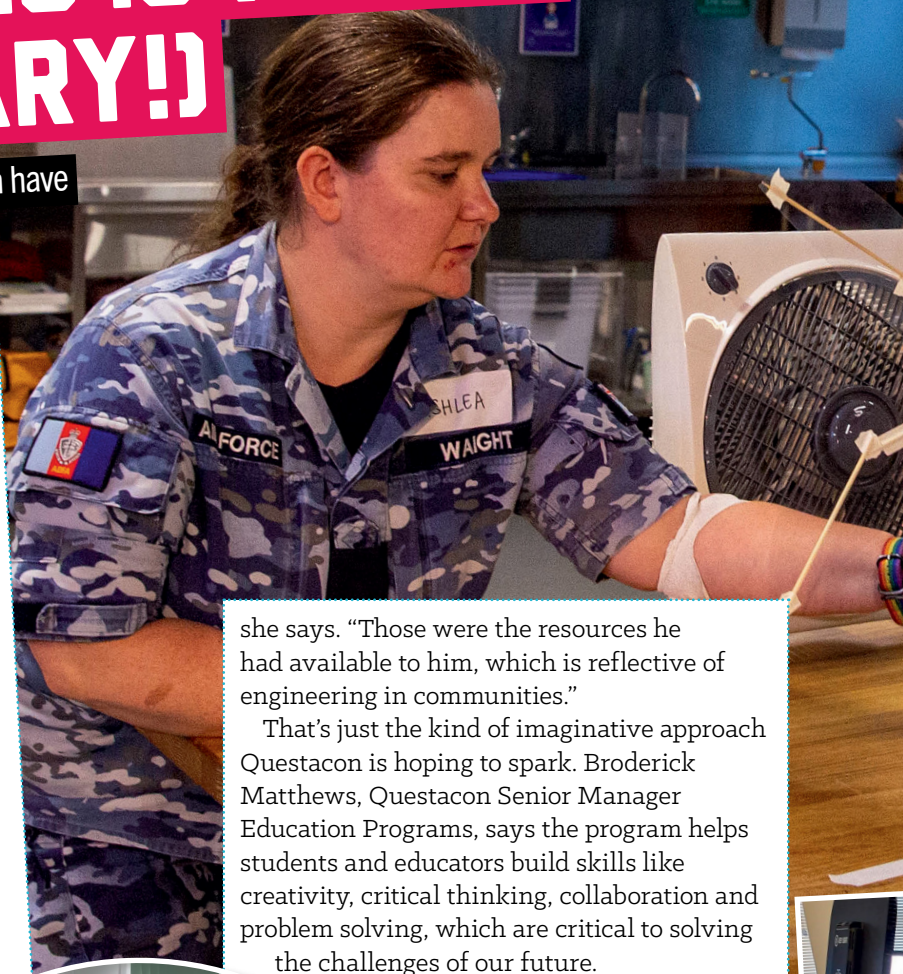
A senior teacher of inclusive education at Centralian Middle School in the Northern Territory, Michelle Pinto did a workshop focused on bridge building. They became so engrossed trying to cantilever five Jenga blocks off the edge of a desk that the organisers had to take the Jenga away!

"Simple things like that are really effective in my classroom setting and give me really practical activities for important concepts," she says.

BUILDING CONNECTIONS

Michelle teaches Year 5 and 6 maths online for the School of the Air in Alice Springs, which educates students living remotely. She has several international students, too. Her students who didn't come to the in-school session built their bridges with whatever they had at home, like old tyres and other things they might find lying around a farm or station.

"The student from Fiji, who took part online, made his bridge out of seashells and fish bones, coconut and pandanus leaves,"



she says. "Those were the resources he had available to him, which is reflective of engineering in communities."

That's just the kind of imaginative approach Questacon is hoping to spark. Broderick Matthews, Questacon Senior Manager Education Programs, says the program helps students and educators build skills like creativity, critical thinking, collaboration and problem solving, which are critical to solving the challenges of our future.

"Australian Defence Force members are an important part of delivering Engineering is Elementary," says Major General Wade Stothart, Head of the People Capability Division at Defence.

"Engineering is Elementary workshops equip primary school educators with the skills, confidence and resources to integrate STEM concepts into their classrooms. The early introduction of STEM concepts teaches students to be problem solvers, critical thinkers, collaborators, and communicators, and better equips them to pursue STEM-related careers in the future.

"By doing so, they provide real, personal, and practical examples of the diversity of STEM careers in the Australian Defence Force. Over the length of this partnership period, Engineering is Elementary will reach over 2500 educators across Australia, and will enable effective STEM practice to reach



TEACHERS IN MACKAY, QLD USE PLAYDOUGH TO BETTER UNDERSTAND CHEMICAL ENGINEERING.



TEACHERS PARTICIPATE IN A WIND WORKSHOP AS PART OF THE ENGINEERING IS ELEMENTARY PROGRAM DELIVERED BY QUESTACON AND SUPPORTED BY THE ADF.

by Engineering is Elementary workshops help me do this.”

Michelle agrees that teaching kids about design processes was a huge deal.

She talked to students about theory and the strength of different structures, like cylinders and prisms, which they built from paper and tested with tubs of rice. Then they had to research, design an idea, test it, improve it and repeat. Just like real engineers!

CAPTIVATING CAREERS

Exposure to engineering before high school helps students understand the huge role STEM careers can play in Defence. Helen says the workshops have inspired her students about the future.

“I have students who say engineering is something they want to study. I have students who will be farmers and engineering will be part of their everyday lives,” she says.

“Even if students don’t specifically become an engineer, the skills learnt following the design process of improving the world around them will help them in all careers.”

Michelle’s students are already making an impact – their bridges had to be usable, not just prototypes. One of them could hold the weight of three adults.

“This just took my teaching to a different level and gave me some really solid resources,” she says, adding that primary teachers don’t often get to do such thorough and fun homework before they go into the classroom.

Both teachers have also started seeing their world through an engineering lens. Michelle says she gained a new understanding of the tricky project to build a roundabout in Alice Springs. Helen now appreciates that engineering is about processes and problem-solving, not just products.



diverse and under-represented audiences across schools in low socioeconomic areas, regional and remote communities, women and First Nations Australians.”

BUILD. TEST. REPEAT

Helen Foy is assistant principal at Binya Public School, NSW, which has just 19 students. She has participated in several Engineering is Elementary workshops online and says the magic works for kids right through from kindergarten to Year 6.

“The chatter and engagement increases as the students are succeeding or failing, as they are discussing the problems of why something isn’t working or which ideas they will use to tackle the problem,” she says.

“I want them to be intrigued and wonder about how things work. The activities created

ENGINEERING IS ELEMENTARY WORKSHOPS ARE ALSO DELIVERED VIRTUALLY. SO GEOGRAPHY IS NO OBSTACLE TO GETTING TOOKED UP IN STEM.

GOING AHEAD WITH STEM

Major General Stothart says the partnership between Questacon and Defence will also support the delivery of the Questacon STEM Futures program and the development of an Applied STEM program. These programs work together to empower primary and secondary educators to establish structures for STEM programs, develop their own STEM resources and embed STEM culture in schools.

“I am excited by the opportunities that this partnership with Questacon presents and am very pleased that it will allow Defence to showcase the diversity of STEM roles, while equipping teachers to teach STEM concepts to the young Australians who will be the future STEM leaders of the nation and the Australian Defence Force,” he says. – by Alison Ratcliffe

YOUR DEFENCE CAREER STARTS HERE!

Whether you're looking for what to do after high school or seeking out further study, there's a way to start out on a great career in STEM + Defence

YEAR 12

OPTION 1

Take a gap year with the ADF

Finished Year 12 and ready to try something new? The Navy, Army and Air Force offer a paid gap year where you can choose the Defence role you want to try on for size. STEM subjects are a bonus if you're looking to try on an officer's hat. Added perks are travel, training and work experience.

More info here: bit.ly/ADFGapYear

OPTION 2

Heading to uni?

If you've completed Year 12, here are a few ways to get a degree while working towards a career in Defence:

- **Australian Defence Force Academy (ADFA):** Dive into STEM degree studies at UNSW while training to be an officer in the Navy, Army or Air Force.
- **Defence University Sponsorship:** Score a salary and leadership training while you finish your engineering, science or healthcare degree (or a bunch of others!). You could have a job waiting for you when you graduate!
- **Join the military:** You can join after you complete your degree, be sponsored at a civilian university or attend ADFA. Or you can join through general entry to gain a technical trade.

More info on joining the ADF: bit.ly/DefEntry

Find out more about STEM careers in Defence Science and Technology Group (DSTG): dst.defence.gov.au/careers/stem-careers

OPTION 3

Snap up an apprenticeship

- **Navy, Army and Air Force:** Defence apprenticeships range from mechanics and electronics to carpentry, aviation and telecommunications: bit.ly/ADFTrades
- **Cyber specialists:** The Australian government's Digital Apprenticeship Program can lead to a Defence cyber role. bit.ly/ASDCyberApprenticeProg

Explore a huge range of STEM apprenticeship options at DSTG: bit.ly/DSTGSTEMapp

AT UNIVERSITY

DEFENCE RECRUITS GRADS FROM A MULTITUDE OF DEGREE AREAS, INCLUDING BUT NOT LIMITED TO ENGINEERING, HEALTHCARE AND SCIENCE FOR A RANGE OF CHALLENGING AND EXCITING ROLES

OPTION 1

Science, Tech & Engineering

- If you're interested in cutting-edge research, check out DSTG's Defence Graduate Program (bit.ly/DefSciTechGrad) or STEM Cadetship Program: bit.ly/3mdPoS9

Defence's Graduate Program also has technical and intelligence pathways that could open doors to engineering, project or cyber roles: bit.ly/DefCareersGrads

OPTION 2

Cyber focus

Want to combine your passion for code and computers with keeping the country safe? Check out these opportunities at the Australian Signals Directorate (ASD):

- Spend a week honing your hacker-blocking skills in a work experience placement at the **Australian Cyber Security Centre (ASCS)**.
- **ASD CyberEXP** is an interactive online program that gives uni and high school students a taste of life on the frontline of Defence cyber security.
- The **ASD Internship Program** is a paid opportunity for uni students to dive into Defence cyber operations during their summer holidays.
- The **Australian STEM Cadetship Program** offers part-time work for uni students in a range of STEM courses, and there's a stream for Defence cyber.

More info here: bit.ly/DEFENCEStudentOps



PART-TIME AND FULL STEM AHEAD

AS A BATTLESPACE COMMUNICATIONS SPECIALIST IN THE ARMY RESERVE, **KELVIN** PROVIDES THE COMMUNICATIONS LINK BETWEEN COMMAND OPERATIONS AND SOLDIERS ON THE GROUND

KELVIN
SIGNALLER,
BATTLESPACE
COMMUNICATIONS
SPECIALIST, ARMY
RESERVE

As a reservist, Kelvin works part-time and has a separate full-time job as a policy officer in the Australian Public Service: "I appreciate being able to break up everyday life with a weekend out field on an Army exercise, or going on a two-week training course. The Army Reserve gives great flexibility and there's no obligation to show up when you are unavailable due to your full-time work being busy, university exams or family commitments."

"Since joining, I've been so greatly supported by the corporals and sergeants in my unit, the 143 Signal Squadron. They've taught me so much and are always looking for opportunities to do something engaging."

Kelvin was interested in STEM from a young age. "Knowing how things work was always going to be fascinating to me. Working in the Signals team has been a great opportunity to learn about and experiment with the electromagnetic spectrum. Some high school physics knowledge comes in very handy!"

LOOKING FOR INSPO? GET SOCIAL



Follow [@defencejobsaustr](#) to keep up to date with career news and stories for Navy, Army and Air Force.

Or if you're more into research, [@defencescience](#) is the feed to tap into.



Defence Jobs Australia has video interviews with technicians and officers, virtual tours of the **Australian Defence Force Academy**, and more.



Follow [@ASDGovAu](#) for news on Defence cyber info sessions and opportunities.

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Defence

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We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging.

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CALL 13 19 01 OR
VISIT [DEFENCEJOBS.GOV.AU/ADFA](https://defencejobs.gov.au/adfa)

