

2017

# Surveying and Geospatial Sciences



---

# SURVEYING AND GEOSPATIAL SCIENCES

---

## Surveying and geospatial sciences use location to measure, map and model our world.

Surveyors are masters of measurement – playing a major role in land development, from the planning and design of land subdivision, through to the final construction of the roads, utilities, and landscape planning. They also play an important part in the construction industry providing detailed design plans for the construction of roads, freeways, tunnels, bridges, pipelines and high-rise buildings.

Using modern devices such as GPS and spatial databases, professionals trained in geospatial sciences can develop maps, 3D plans, establish borders, track moving points, pinpoint distances and mark the location of natural and manmade features of the terrain.

In Australia, professionals in both fields are highly sought after and the employment prospects for graduates are extremely high.

RMIT is the only education provider in Victoria to offer qualifications in surveying and geospatial sciences from a certificate IV level right up to postgraduate degrees, with close connections with major industry bodies including the Surveying and Spatial Sciences Institute and the Institution of Surveyors Victoria.

RMIT's fully-equipped field station at Yarra Bend gives access to a range of different environments and students regularly take part in field trips to locations like the Rubicon Valley to gain practical experience.



Cover image

---

## CLAIRE KNAUTH

---

**“I completed eight weeks’ work experience at the Department of Economic Development, Jobs, Transport and Resources updating shoreline segmentation and shoreline access point data, which is used to survey the shoreline during an oil spill.**

“This experience benefitted me greatly, not only opening my eyes to the type of work I could do once I graduate, but also providing valuable experience in the industry.”

Bachelor of Science (Geospatial Science) (Honours)

# Certificate IV in Surveying

RMIT Code: C4336

National Course Code: CPP40112

Part-time 1 year, City campus

[www.rmit.edu.au/programs/c4336](http://www.rmit.edu.au/programs/c4336)

Learn how to use surveying technologies and software to capture, process and present data, and gain practical experience with industry-standard equipment.

This program is available as either a traineeship or non-traineeship.

For students undertaking this program in traineeship mode, study will complement the workplace training.

## What You Will Study

You'll learn how to collect and interpret spatial data in various forms and operate surveying equipment. You'll become experienced in the field and be able to organise field services, equipment and supplies. You'll also learn how to use spatial software applications to prepare and present Geographic Information System (GIS) data and produce computer-aided drawings. Practical skills are integrated with important analytical skills like implementing risk management systems, and developing environmentally sustainable practices.

## Industry Connections

You'll gain industry exposure through regular seminars with guest speakers and opportunities to take part in simulated spatial science and survey activities at our Yarra Bend field station.

## Career

Graduates are employed in the spatial information industry as assistants to land surveyors, survey technicians, GIS/GPS operators or as computer draftspersons.

You may initially work in areas like land management, civil and structural engineering, or asset management for local government or mining companies. Job titles may include engineering surveyor, geographic information systems officer, GIS/GPS operator or surveying technician.

## Entry Requirements

None

## Pathways

Graduates may be eligible for exemptions in the Diploma of Surveying.



## What is a Traineeship?

At RMIT, the Certificate IV in Surveying is offered with a traineeship mode option. Traineeship programs allow you to learn key skills in a profession through a mix of formal learning through an institution such as RMIT and on-the-job experience gained via an employer.

As a trainee, you'll be employed under a government-approved training contract between you and an employer. Training contracts can also be developed to meet an employer's specific needs. To become a trainee, you must be at least 15 or over. You may already hold another qualification.

To become a trainee you need to first find an employer. You and your employer will then meet with an Australian Apprenticeships Centre (AAC) representative to sign a training contract. As part of this process you and your employer will choose a registered training organisation (RTO), such as RMIT, to provide formal training support, guidance and assessment.

Your RTO will provide you with a structured training program and qualified supervisors to ensure you cover the requirements of the approved training scheme. Your employer will be responsible for providing you with a range of work experience opportunities and for allowing you an appropriate amount of time off from regular work duties to fulfil the needs of your training.

# Diploma of Surveying

RMIT Code: C5320

National Course Code: CPP50112

Full-time 1 year, City campus

[www.rmit.edu.au/programs/c5320](http://www.rmit.edu.au/programs/c5320)

Surveying services rely on the collection, management and presentation of information that relates to surveying, mapping and GPS.

In this program, you will extend your studies and knowledge with increased practise with digital technologies and surveying tools that map and display information drawn from multiple databases.

## What You Will Study

You will further your skills by learning to conduct advanced Global Navigation Satellite System (GNSS) data collection and set-out surveys; create engineering drawings; and perform advanced surveying computations.

There is a focus on geodetic surveying including how to perform geodetic surveying computations. You will also develop industry-specific skills including how to undertake site surveys and set-out procedures for building projects; compile and check survey plans; and develop a subdivision survey design for local government approval.

You'll become more experienced with data and be able to manipulate and analyse geographic information system (GIS) data and use complex spread sheets.

Surveying is an integral part of local, state and national land management programs, building and construction projects, environmental studies, navigational systems and emergency situations monitoring. As part of your assessment, you will conduct an engineering surveying project.

## Industry Connections

You'll gain industry exposure through regular seminars with guest speakers and opportunities to take part in simulated spatial science and survey activities at our Yarra Bend field station.

## Career

The full-time program is only three days a week so you can work part time in the industry as a paraprofessional.

With several industries that are dependent on surveyors, particularly construction, the long term career opportunities for surveyors are very encouraging.

You may find work in the industry as an assistant to land surveyors or as a survey technician, a GIS/GPS operator or a computer draftsman. Work is available in areas including land management, civil and structural engineering, and asset management for local government or mining companies.

## Professional Recognition

You'll be eligible for student membership to the Surveying and Spatial Sciences Institute and the Institution of Surveyors Victoria.  
[www.sssi.org.au](http://www.sssi.org.au)  
[www.surveying.org.au](http://www.surveying.org.au)

## Entry Requirements

None

## Pathways

If you successfully complete the Diploma of Surveying, you will be eligible for entry to the Advanced Diploma of Surveying.



RMIT's field station at Yarra Bend Park gives access to different environments and terrains.



Modern surveying practice integrates computer software into fieldwork.



Student using a Trimble/Faro 3D laser scanner to measure the exterior of a building.



## JONATHAN WONG

**I chose RMIT to study surveying because of its reputation for teaching and producing some of the best land surveyors in the country. It's a practical program and you gain hands-on skills relevant to the workplace.**

I'm currently working part-time for a surveying firm, using the skills and knowledge learnt at RMIT and applying them to workplace projects.

I love what I do because there's a great balance between field work and office work - every job is different and there's the potential to work anywhere in the world."

Advanced Diploma of Surveying  
Survey Technician, Webster Survey Group

## Advanced Diploma of Surveying

RMIT Code: C6129

National Course Code: CPP60312

Full-time 1 year, City campus

[www.rmit.edu.au/programs/c6129](http://www.rmit.edu.au/programs/c6129)

Surveying is based on the collection, management and presentation of information related to surveying, mapping and geographical information systems.

In this program, you'll gain the educational and practical training to extend your career in the surveying, mapping, and geographical information systems (GIS) industries.

### What You Will Study

You'll use cutting edge surveying technologies and software and take part in land development exercises. You will also learn cadastral surveying. Throughout this program, you will develop the capacity to conduct an advanced global navigation satellite system (GNSS), control and monitor complex engineering surveying structures.

Being an integral part of local, state and national land management programs, building and construction projects, environmental studies, navigational systems and monitoring of emergency situations, you'll design a spatial project plan and learn how to apply quality control measures to the spatial information services industry.

As part of this program, you will act as a surveying team leader for your major project, conduct research into an issue and present your findings. You can liaise with real-life employers to develop and deliver this project.

### Industry Connections

RMIT has a strong partnership with the industry through our Industry Advisory Committee and regular visits to workplaces to get feedback on the industry's training needs.

We facilitate student placements in employment and invite industry partners to give presentations.

We also host industry events for the Surveying and Spatial Science Institute, the Surveying Taskforce and the Land Surveying Commission of the Surveying and Spatial Science Institute.

### Career

The full-time program is run over two days each week, and you are encouraged to investigate part-time work as a paraprofessional in the surveying industry while you study.

RMIT's strong links with surveying and spatial industry associations mean graduates are highly sought after.

You may be employed as an assistant to a land surveyor, survey technician, survey field party leader, GIS/GPS operator, or computer draftsman. You may initially work in areas such as land management, civil and structural engineering, or asset management for local government or mining companies.

### Professional Recognition

You'll be eligible for student membership the Surveying and Spatial Sciences Institute and the Institution of Surveyors Victoria.

[www.sssi.org.au](http://www.sssi.org.au)

[www.surveying.org.au](http://www.surveying.org.au)

### Entry Requirements

Diploma of Surveying

### Pathways

Graduates with a grade point average (GPA) of at least 2.0 out of 4.0 may be eligible to receive:

- Credit for nine courses (equivalent to 108 credit points) from the Bachelor of Applied Science (Surveying)(Honours), if successful in gaining a place or
- Credit for ten courses (equivalent to 120 credit points) from the Bachelor of Science (Geospatial Science)(Honours), if successful in gaining a place.

# Bachelor of Applied Science (Surveying) (Honours)

RMIT Code: BH116

Full-time 4 years, Part-time may be available

City campus

[www.rmit.edu.au/programs/bh116](http://www.rmit.edu.au/programs/bh116)

Whether they're locating a property boundary or setting out a high-rise building, today's surveyors use advanced equipment and specialised software to determine the accurate position of features on Earth. They use robotic laser instruments to observe and record surveys, distances are electronically measured with light beams, and position is fixed using satellite positioning technology (GPS).

Surveyors have a thorough knowledge of algebra, basic calculus, geometry, and trigonometry. They must also know the laws that deal with surveys and property. In addition, they must be able to use delicate instruments with accuracy and precision.



**CHRIS ATTARD**

**“RMIT is regarded as having the best and most practical course in Victoria with strong industry links. Industry demand is high for well-trained surveyors and the work experience component of the RMIT program really helps to get a foot in the door.**

“My studies at RMIT prepared me well for work with everything put into practice – one way or another.

“I'm currently working as a civil surveyor on various subdivision and road projects around Melbourne.”

Bachelor of Applied Science (Surveying)  
Graduate Surveyor at RMK Engineering Surveyors

## What You Will Study

RMIT offers the only bachelor degree in surveying in Victoria.

In the early years of the program, you will study the fundamentals of measurement science, cartography and spatial information science (GIS). Other fundamental skills in mathematics, statistics and physics are also covered.

In later years, more specialised studies are offered in geodesy, remote sensing, image analysis and professional practice.

Specialised studies in cadastral and engineering surveying, GPS and advanced adjustment methods are central components of the program.

Field camps are held in the second and third years to reinforce the theoretical learning and allow you to exercise your knowledge of real-world problems.

Practical work is based on industry-standard software and hardware, the same tools you will find in the workplace. You will have ample opportunities to develop skills and experience with these tools.

Learning support includes a first year transition program, academic coordinators for each year level and an active Geospatial Science Student Association. There is also a dedicated field station at Yarra Bend Park to support practical work.

## Career

Career opportunities for surveyors have grown dramatically in recent years and are forecast to keep growing.

Surveyors work on all sorts of projects in all sorts of places—from land development and construction in the city to mining in the outback and offshore. They also get great money and travel the world.

Some surveyors work with mining companies on exploration, mining development and mining operations. Other surveyors specialise in hydrographical surveys working with automated position and sounding equipment on survey ships to map the ocean floor.

In recent years, graduate employment has approached 100% and there is an ongoing shortage of suitably qualified surveyors.

Many graduates enter a Professional Training Agreement and become licensed surveyors.

## Professional Recognition

The program is externally accredited through the Surveyors Registration Board of Victoria (SRBV). This means that the Board has identified it as one of the qualifications that leads to registration as a Licensed Surveyor in Victoria.

The Board is also a member of the Council of Reciprocating Surveyors Boards of Australia and New Zealand (CRSBANZ). Since 1892 the Council has been overseeing the reciprocal recognition of surveyor licensing between Australian States and Territories and New Zealand.

Graduates are eligible to apply for membership of The Institution of Surveyors Victoria (ISV), the Surveying and Spatial Sciences Institute (SSSI).

The program has international accreditation with the Royal Institute of Chartered Surveyors (RICS) which also entitles graduates to membership of that institute.

The program is also accredited by the Land Surveyors Board of Malaysia as a recognised qualification.

## Entry Requirements

### Pre-requisites

Units 3 and 4 – a study score of at least 20 in one of Mathematical Methods (CAS) or Specialist Mathematics; and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).

### Additional Information

Non-Year 12 applicants may submit additional information if they would like it to be considered. For semester 1 intake, this can be completed through the VTAC Personal Statement online. For semester 2 intake, this can be completed through the personal statement in the Apply Direct application.

### Pathways

Graduates of the RMIT Advanced Diploma of Surveying who achieve a grade point average (GPA) of at least 2.0 out of 4.0 may be eligible to receive exemption for up to one year credit (equivalent to 108 credit points) if successful in gaining a place.

# Bachelor of Science (Geospatial Science) (Honours)

RMIT Code: BH117

Full-time 4 years, Part-time may be available

City campus

[www.rmit.edu.au/programs/bh117](http://www.rmit.edu.au/programs/bh117)

This program paves your way for a career in interpreting how location has an impact on the way we interact with the world around us.

Geospatial scientists use location as the key to collecting, managing, analysing and interpreting information.

It's a specialised discipline, so you'll enjoy the advantage of relatively small class sizes, focused content and staff who are easily accessible.

RMIT maintains strong links with industry and members of the profession regularly participate in our teaching programs.

## What You Will Study

With a sound theoretical base, most courses incorporate extensive practical work to build skills as well as knowledge.

Learning support for students includes a first year transition program, academic coordinators for each year level and a strong Geospatial Science Student Association.

In the early years of the program, you'll study the fundamentals of measurement science, cartography and spatial information science (GIS).

Other fundamental skills in mathematics, statistics and physics are also covered.

In later years, more specialised studies are offered in geodesy, map projections, spatial analysis, web design, remote sensing, image analysis and professional practice.

Elective choices give you the opportunity to develop further skills in these areas or to learn more about information technology, environmental studies, planning and land administration.

From first year, you'll engage in project-based learning, tackling real-world problems and designing solutions using geospatial tools.

This continues in other years, and you'll design and undertake a substantial major project in your final year.

Practical work is based on industry-standard software and hardware, the same tools you'll find in the workplace. You'll have ample opportunities to develop skills and experience with these tools.

## Career

Geospatial scientists develop and manage geographic information systems in a diverse range of exciting areas including:

- land administration and reform
- urban planning
- subdivision planning
- infrastructure management
- natural resource monitoring and development
- coastal zone management and mapping
- disaster informatics for disaster risk reduction and response
- weather forecasting

Graduates work in diverse roles that:

- manage and plan land use systems in local government
- map and analyse crime patterns with the police
- build systems for monitoring the spread of infectious disease
- provide maps and other data for mobile phones

As more and more organisations rely on spatial data as a key information source, the industry demand for graduates grows stronger.

It's typical that more than 90% of our graduates are employed within three months of completing their studies.

## Professional Recognition

Graduates from this program are eligible for admission to the Surveying and Spatial Sciences Institute. They also meet the requirements to be members of the Mapping Sciences Institute of Australia.

[www.sssi.org.au](http://www.sssi.org.au)

[www.mappingsciences.org.au](http://www.mappingsciences.org.au)

The program has international accreditation with the Royal Institute of Chartered Surveyors (RICS) which also entitles graduates to membership of that Institute.

## Entry Requirements

### Pre-requisites

Units 3 and 4 – a study score of at least 20 in mathematics (any) and a study score of at least 25 in any English (except EAL) or at least 30 in English (EAL).

## Pathways

Graduates of the RMIT Advanced Diploma of Surveying who achieve a grade point average (GPA) of at least 2.0 out of 4.0 may be eligible to receive credit for up to one year (equivalent to 120 credit points), if successful in gaining a place.



## NICOLE KIELY

**"I'm a spatial analysis consultant for Jacobs (formerly Sinclair Knight Merz) where I provide spatial solutions for mining, power, infrastructure and environmental projects. I also provide technical support for mapping, data supply and data management.**

"At RMIT I gained the technical software skills and the analytical processes needed in my field. I was encouraged to be flexible in order to easily transition into different technical areas – from cartography to spatial analysis to imagery analysis and so on."

Bachelor of Science  
(Geospatial Science) (Honours)\*  
Spatial analyst, Jacobs

\*Formerly Bachelor of Applied Science  
(Geomatics) (Honours)

[www.rmit.edu.au/study-with-us/science/surveying-and-geospatial-sciences](http://www.rmit.edu.au/study-with-us/science/surveying-and-geospatial-sciences)

#### Further Information

Info Corner  
330 Swanston Street  
(cnr La Trobe Street)  
Melbourne VIC 3000  
Tel. +61 3 9925 2260  
Email: [study@rmit.edu.au](mailto:study@rmit.edu.au)

For current fee information, visit  
[www.rmit.edu.au/programs/fees](http://www.rmit.edu.au/programs/fees)

This guide is designed for Australian and New Zealand citizens and permanent residents of Australia.

Further information for international/non-residents of Australia:

RMIT International  
Tel. +61 3 8676 7047  
(within Australia: 1800 998 414)  
Email: [isu@rmit.edu.au](mailto:isu@rmit.edu.au)  
[www.rmit.edu.au/international](http://www.rmit.edu.au/international)

Every effort has been made to ensure the information contained in this publication is accurate and current at the date of printing. For the most up-to-date information, please refer to the RMIT University website before lodging your application. RMIT University CRICOS Provider Code: 00122A. RMIT University Registered Training Organisation code: 3046. Prepared May 2016. 14336 0516