VICTORIA UNIVERSITY

PROJECT-BASED GRADUATE RESEARCH STIPEND SCHOLARSHIP APPLICATION GUIDE

Predictive Analytics for Ambulance Demand, Ramping, and Resource Optimisation

Doctor of Philosophy ONLY

Newly commencing Australian residents (all domestic students including Australian citizens, Australian permanent residents, New Zealand citizens and holders of a permanent Australian humanitarian visa)

Newly commencing International students

09/12/2025
Version 1.0

Acknowledgement of Country

Victoria University acknowledges, recognises and respects the Ancestors, Elders and families of the Bunurong/Boonwurrung, Wadawurrung and Wurundjeri/Woiwurrung of the Kulin who are the traditional owners of University land in Victoria, the Gadigal and Guring-gai of the Eora Nation who are the traditional owners of University land in Sydney, and the Yulara/Yugarapul people and Turrbal people living in Meanjin (Brisbane).

Contents

Key Details

This guide is for applicants interested in a graduate research scholarship commencing in **Research Period 1 or Research Period 2 2026** at Victoria University.

This scholarship is for the purpose of undertaking a graduate research degree related to the project outlined below and in **Table 1**.

The Stipend Value and Included Benefits are outlined in **Table 2**.

The Project

Project Description

This PhD project will focus on developing advanced **machine learning and spatiotemporal models** to forecast ambulance demand, understand the dynamics of ramping, and optimise resource allocation across metropolitan and regional Victoria. Using multi-year datasets from **Ambulance Victoria** and complementary data sources—including **emergency department (ED) status, environmental conditions, demographic information, and traffic data**—the candidate will identify **temporal and spatial correlations** affecting ambulance service performance.

In addition to forecasting call-out demand, the project will examine **relationships between ramping duration, ED waiting times, time-of-day, and seasonal or monthly variations** to uncover systemic bottlenecks and operational risk factors. The research will employ **deep learning architectures, probabilistic graphical models, and spatiotemporal clustering techniques** to model complex interdependencies and develop data-driven insights for real-time decision support.

This PhD forms part of the broader collaborative research initiative *Optimising Emergency Healthcare: A Data-Driven Approach to Ambulance Ramping and ED Efficiency*, jointly undertaken by Victoria University's Centre of Excellence in Paramedicine and **Ambulance Victoria,** with ethics and data approvals in place.

Objectives

- Analyse and model temporal and spatial patterns in ambulance callouts, ramping events, and ED waiting times.
- Quantify and model correlations between **ramping time, ED waiting time, time-of-day, day-of-week, and month-of-year** to identify systemic patterns and pressure points.
- Develop and validate **machine learning algorithms** for forecasting ambulance demand and ramping likelihood in near real time.
- Integrate demographic, environmental, and operational variables to improve predictive accuracy and situational awareness.
- Contribute to a **decision-support framework** that assists Ambulance Victoria in proactive resource deployment, roster planning, and capacity management.

Expected Outcomes

- Predictive models capable of **early detection of demand surges, ramping risk, and ED congestion trends.**
- Quantified understanding of **temporal and seasonal correlations** driving ambulance ramping and patient flow delays.
- A **prototype dashboard or decision-support tool** for operational use by Ambulance Victoria.
- Peer-reviewed publications and validated findings from real-world collaboration with Ambulance Victoria and partner EDs.

The Candidate

We are seeking a highly motivated and capable PhD candidate with a strong academic foundation in computer science, data analytics, artificial intelligence, or a related discipline. The successful applicant will demonstrate strong analytical thinking, an aptitude for applied research, and a genuine interest in solving real-world problems within the emergency healthcare sector. The candidate will work closely with Ambulance Victoria and the Centre of Excellence in Paramedicine to develop data-driven models that enhance decision-making and optimise emergency response performance.

The ideal candidate will be proactive, detail-oriented, and able to work independently while collaborating effectively within a multidisciplinary research team involving data scientists, health informaticians, and clinical partners.

Eligibility requirements

To be eligible, applicants must:

- Meet Victoria University's admission requirements for entry into the Doctor of Philosophy (PhD) program.
- Hold an Honours degree (First Class or equivalent) or a Master's degree by research in computer science, data science, artificial intelligence, applied mathematics, or a closely related discipline.
- Be eligible to enrol full-time and commit to on-campus research engagement.
- Satisfy English language proficiency requirements (IELTS 6.5 overall with no band below 6.0, or equivalent).
- Demonstrate research capability through academic achievements, project experience, or prior publications.

Desirable skills and experience

Applicants with the following skills and experience will be highly regarded:

- Proven experience in machine learning, deep learning, or predictive analytics using Python, R, or similar platforms

- Knowledge of spatiotemporal modelling, statistical correlation analysis, and data visualisation techniques
- Experience working with large-scale datasets or streaming data from operational or healthcare systems
- Familiarity with data engineering, API integration, or health informatics standards (e.g., HL7, FHIR)
- Understanding of ambulance or healthcare system operations, resource optimisation, or public health analytics
- Strong written and verbal communication skills, with the ability to engage with technical and non-technical stakeholders
- Demonstrated ability to conduct independent research, manage competing priorities, and meet deadlines

Application due date

a. Application Due Date	Open until filled

Table 1: Project Outline

Item	Detail
a. Expected Commencement Date	16 February 2026
b. Project Title	Predictive Analytics for Ambulance Demand, Ramping, and Resource Optimisation
c. Funding Agency	Victoria University Centre of Excellence in Paramedicine and Ambulance Victoria
d. Chief Investigator	Dr Khandakar Ahmed
e. Associate Supervisor	Dr Assefa Teshome

Table 2: Stipend Value and Included Benefits

Item	Detail
a. Value of stipend per annum	A$39,278 (2026 rate)
b. Fixed rate or incremented	Incremented
c. Fee offset included	Fee Offset Included
d. PhD and/or Master Research Degrees available	PhD only
e. Part-Time Available	No
f. Overseas Student Health Cover	Included (Single)

Eligibility

Domestic Applicants

To be eligible for this scholarship, domestic applicants must:

- Be Australian residents (all domestic students including Australian citizens, Australian permanent residents, New Zealand citizens and holders of permanent Australian humanitarian visas)
- Meet the minimum academic entry and English language requirements for admission to the degree – see **website** for further details
- Not already have completed a research degree at the same or higher Australian Quality Framework (AQF) (or equivalent for overseas institutions)

International Applicants

To be eligible for this scholarship an international applicant must:

- Be a citizen of any country other than Australia or New Zealand.
- Meet the University's academic entrance requirements for enrolment into a research degree - see **website** for further details.
- Meet the University's English language proficiency requirements for enrolment in a research degree. Click **here** for further details.
- Enrol onshore (in person) as a full-time student.

You are **NOT ELIGIBLE** for if you:

- Have previously held an IPRS, VUIPRS or OPRS (unless it was for a Masters by Research degree, and you are applying for a scholarship to undertake PhD studies).
- Are currently studying, or have recently studied, on an AIDAB or AUSAID scholarship and are applying for an IPRS immediately following the AIDAB/AUSAID funded studies.

Priority will be given to:

- Applicants without an equivalent level degree.

Conditions and Benefits

Successful applicants will receive a full guide to the conditions and benefits of the Scholarships at the time of offer. The following is a summary of the main benefits and conditions.

Scholarship Value

Stipend Value

The annual value of the stipend is provided in Item (a) Value of Stipend per Annum in **Table 2** and are currently exempt from taxation.

If Item (b) of **Table 2** is marked as “Incremented” then stipend payments are indexed annually.

Fee Offset Value

Domestic Applicants

In 2026, the value of this the Fee Offset component of a Scholarship is $14,000 - $16,750 per research period depending on the course.

International Applicants

If Item (c) of **Table 2: Stipend Value and Included** Benefits is marked “Fee Offset” or “RTP Fee Offset” then international award holders will be granted a fee offset or Research Training Program fee-offset scholarship respectively, covering tuition fees for the duration of the course.

In 2026, the value of this component of the Award is between A$17,500 and A$20,700 per research period depending on the course.

If Item (d) of **Table 2: Stipend Value and Included** Benefits is marked “OSHC Included – Single” then International award holders of this project scholarship will be granted Overseas Student Health Cover (OSHC) for maximum duration of the degree in which they are enrolled and an additional two month of health cover.

Excluded Costs

The following costs are NOT included:

- travel costs
- the cost of English language testing
- the cost of bridging programs or English language programs

Additional awards, allowances and stipends

Holders of Scholarships may:

- Be in receipt of minor award, allowances or other earnings which are supplementary to a scholarship, or derived from part- time work within the policies of Victoria University
    a. student must not be receiving income from another source to support that student's general living costs while undertaking their course of study if that income is greater than 75 percent of that students VU HDR or RTP Stipend rate;
    b. income unrelated to the course of study or income received for the student's course of study but not for the purposes of supporting general living costs is not to be taken into account.

Period of Support

All candidates are expected to complete their study in the timely duration for their degree as per **Table 3**.

Table 3: Stipend durations for full-time Higher Degrees by Research

	Stipend Duration	Timely Duration
Doctor of Philosophy	3.5 years	4 years

Periods of study already undertaken towards the degree prior to the commencement of the award will be deducted from the normal period of award tenure. Similarly, periods of study undertaken during suspension of the award, or undertaken during the tenure of a previous Research Training Program Stipend or Australian Postgraduate Award, will be deducted from the maximum period of tenure.

A Scholarship holder may be required to pay tuition fees for any period of enrolment in excess of the timely duration.

Employment

Stipend candidates are expected to normally study and research full-time (minimum of 36.75 hours per week) between the hours of 8.00am – 6.00pm Monday to Friday with Stipend candidates limited to a maximum of eight (8) hours paid employment per week during these hours. Please refer to the **Higher Degree by Research Scholarship Procedure.** Employment must not interfere with the candidate's progress.

Commencement

No deferrals of the Scholarship will be considered. All successful applicants are expected to commence study by the Commencement Date advised in the Letter of Offer. The Commencement Date will normally be the Expected Commencement Date in Item (a) of **Table 2 Project Outline**, however the University reserves the right to change the Commencement Date in the Letter of Offer when offering a scholarship.

If an applicant cannot start by the Commencement Date, the offer of the Scholarship may be withdrawn.

Scholarship Selection Procedures

Eligibility

All applications are assessed against the Domestic Applicants criteria for the scholarship scheme. Those applications deemed ineligible for a scholarship will not be processed any further and ineligible applicants will be notified of the result.

Ranking against the selection criteria

The Project Supervisor will rank eligible applications based on academic merit, relevant research experience, publications and relevant work experience. They may identify applications which are not for further consideration (NFFC).

The Project Supervisor may contact an applicant directly for more detail regarding their application.

Final Ranking

The Institute Associate Director will determine a final ranking of applications, identifying the preferred application.

Appeals

A request to review a scholarship decision must be lodged in writing **dean.gradresearch@vu.edu.au** within 10 University business days of the applicant being informed of the decision.

A review of a scholarship decision is available in circumstances where unsuccessful applicants believe there was a breach of process in the handling of their application;

The Dean, Graduate Research will undertake, or arrange a review if there is a conflict of interest, of the decision and a written outcome will be provided within 10 University business days of the date that the request was received by VU. If there are any delays to the timeline for any outcome, the Dean, Graduate Research will advise the applicant the reason for the delay and the date that they may receive an outcome of the review.

Application Submission

Please submit your CV and Cover Letter to Dr Khandakar Ahmed at **Khandakar.Ahmed@vu.edu.au**

Successful applicants will be required to submit a formal application through the Victoria University Admissions portal and meet all University requirements for admission and enrolment. Refer to the steps at **Apply For Graduate Research**

For more information

Please contact: **Khandakar.Ahmed@vu.edu.au**