

# Martin Skilleter

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Focussed college student seeking to gain work experience in **mathematical tutoring**. Prior work experience and leadership roles demonstrate the ability to work co-operatively with and constructively guide a team.

## PERSONAL ATTRIBUTES

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- **Proficient academic** – demonstrated excellence in university academic curricula and techniques required to learn
- **Effective teacher** – articulate communicator aware of the different styles required to work with others. Practised in conveying difficult mathematical concepts in a variety of settings
- **Reliable and organised** – approaches responsibilities guided by strong ethics, with effective prioritisation and time management

## KEY SKILLS and COMPETENCIES

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- Ability to learn new content independently and convey ideas to others
- Experience with adapting to different teaching styles to best assist students
- Familiarity with problems faced by students when learning content

## EDUCATION

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- **Bachelor of Philosophy – Science (Honours)**  
Australian National University From 2018
- **Queensland Certificate of Education**  
Brisbane Grammar School 2017

## AWARDS and COMMENDATIONS

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- **Scholarships** – (i) National University Scholarship; (ii) College of Engineering & Computer Science Research & Development Excellence Scholarship; (iii) Bachelor of Mathematical Sciences Relocation Grant From 2018
- Summer Research Scholar Summer of 2019 / 2020
- Dean's Science Education Commendation Award 2019
- **Year 12** – Overall Position 1 / Australian Tertiary Admission Rank of 99.90 2017
- Cockle Prize for **Dux of Mathematics**
- **General Merit Award** for Outstanding Academic Achievement
- QCAA **Distinguished Academic Achiever** Award
- Working with Vulnerable People General Registration 2018

## PREVIOUS EXPERIENCE and LEADERSHIP ROLES

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- **Internship** – Junior Quality Assurance Officer at *Fugro Roames Pty Ltd* Summer of 2015 / 2016
- **Internship** – Data Analyst at *LGIAsuper* Summer of 2018 / 2019
- **Course Representative** – MATH1116, MATH2322, MATH4204 2018 / 2019
- **Peer-Assisted Learning Mentor** for MATH1005, MATH1116 2019
- **First-year Drop-In Mentor**
- **Sponsorship Officer** for ANU Mathematics Society
- **President** of ANU Mathematics Society 2020
- **Demonstrator** for MATH1005 at the Australian National University

## PREVIOUS RESEARCH and SPECIAL TOPICS

Project Title	Description	Supervisor
The Implementation of Inner Product Spaces in Lean	I investigated the mathematical theory of inner product spaces and Hilbert spaces in the context of implementing this theory in the interactive theorem proving language Lean. I developed the rudimentary theory, including implementing the axioms of an inner product space, and proceeded to prove results such as the Jordan von Neumann Theorem, the Orthogonal Decomposition Theorem and the Riesz-Representation Theorem.	Prof. Scott Morrison
Differential Geometry and de Rham Cohomology	I followed the text <i>Calculus on Manifolds</i> by Michael Spivak to learn the elementary theory of differential geometry. Ben Andrews provided resources to extend the project into the topics of Riemannian metrics and de Rham Cohomology.	Dr. Ben Andrews
Applications of Persistent Homology to Identifying Bridges in Graphs	I used techniques from the field of persistent homology to develop an algorithm to identify bridges in graphs. This algorithm has applications in identifying diffusers of malicious information through social media.	Dr. Katharine Turner
Perverse Sheaves & Deligne-Lusztig Theory	<p>This formal lecture course was divided into two sections. In the perverse sheaves component, we developed the theory of derived categories and <math>t</math>-structures on a triangulated category. We used this to study perverse sheaves and the perverse <math>t</math>-structure induced by a perversity function.</p> <p>The Deligne-Lusztig component was devoted to various classifications for characters on finite reductive groups, including parabolic induction and Deligne-Lusztig induction.</p> <p>The two components were brought together to define character sheaves on a finite reductive group.</p>	Dr. Asilata Bapat & Dr. Uri Onn
Computational Algebraic Geometry	<p>This course gave a computational approach to modern algebraic geometry, developing algorithms and showing their applications using the language Macaulay2.</p> <p>As a personal project, I studied the invariant theory of finite matrix groups, culminating with the Chevalley-Todd-Shephard Theorem. This theory has direct applications to the representation theory of finite groups of Lie type.</p>	Dr. Martin Helmer

<p>Vector Bundles and K-Theory</p>	<p>This course developed the theory of vector bundles on a topological space, defining topological <math>K</math>-theory and showing its applications.</p> <p>As a personal project, I gave an alternate <math>K</math>-theory for analytic objects called <math>C^*</math>-algebras. I also proved the Serre-Swan theorem, which shows that topological <math>K</math>-theory is a special case of operator <math>K</math>-theory of <math>C^*</math>-algebras.</p>	<p>Dr. Vigleik Angelteveit</p>
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