School of Mathematics and Statistics
Faculty of Science

Mathematics and Statistics Learning Centre Annual Report

2022

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Message from the Academic Manager

The academic year 2022 was significant in the Mathematics and Statistics Learning Centre (MSLC). I was fortunate enough to begin my role in the MSLC at the start of the year, just as the School transitioned in 22 new Teaching Associate positions within the MSLC. These positions focus primary on small-class teaching and mark a major change in how the School manages its workforce for teaching in tutorials, labs and workshops.

The start of 2022 also saw the beginnings of a transition back to in-person learning following a year in which many students undertook most of their studies remotely. Semester 1 2023 will mark the end of this transition as the Faculty of Science resumes fully in-person operation for nearly all its undergraduate activities. Our time spent developing online resources and expertise during these periods of remote teaching and learning will continue to support the evolving student population, one which is likely to be more comfortable doing their primary learning outside the classroom than any prior cohort.

This report provides an overview of the main activities of the MSLC in 2022 in three core areas: Teaching and Learning, Scholarly Engagement, and Service and Training. In each of these areas the MSLC has made major contributions in 2022 and looks forward to continuing with many of the activities outlined throughout 2023.

Looking ahead to 2023, major changes to the Enterprise Business Agreement and the University's commitment to decasualisation of the academic workforce will be an impetus for the MSLC to renew strategies and priorities for staffing the tutorial program. This renewal will likely lead to increased opportunities for postgraduate students to take part in small-class teaching as part of their time spent as students at the University of Melbourne.

Dr Christopher Duffy
Academic Manager, Mathematics and Statistics Learning Centre

MSLC Staff

Dr Christopher Duffy – Academic Manager
Dr Paul Fijn – Lecturer (Outreach)
Dr Rob Maillardet – Lecturer
Dr Anthony Morphett – Lecturer
Ms Rosie Pingitore – Administrative Support Officer
Dr Yuji Saikai – Melbourne Early Career Academic Fellow
Dr Alba Santin Garcia – Senior Tutor
Dr TriThang Tran – Lecturer

Teaching Associates

Ms Christine Armstrong
Mr James Clift
Dr Alegra Dajic
Ms Julie Frearson
Dr Javeria Jalal
Dr Khurram Kamran
Ms Aisha Khurram
Ms Meirian Lovelace-Tozer
Dr Rekha Mathur
Mr Matthew Mack
Dr Vasuki Prabaharan
A/Prof Andrei Ratiu
Dr Tian Sang
Mr Nick Sgro-Traikowski
Dr Ritu Taneja
Dr Qiao Wang
Dr Paul Williams
Ms Jiami Zhang
Dr Jian Ying Zhang

Departing Staff

Mr David Batt (Teaching Associate)
Dr Shelly Levin (Teaching Associate)
Dr Jackson Yuen (Teaching Associate)

Career Milestones

Promotion to Level B: Dr Paul Fijn and Dr TriThang Tran
Academic Confirmation: Dr Alba Santin Garcia and Dr TriThang Tran
Graduate Certificate in Undergraduate Teaching Completion: Dr Paul Fijn

Teaching and Learning

Throughout 2022 members of the MSLC made major contributions to the School's undergraduate offerings, through subject coordination, lecturing, and delivering tutorials, labs and workshops. Additionally, members of the MSLC undertook major work in developing learning materials in a variety of formats through a number of grant-supported projects.

Looking ahead to 2023, the launch of the Victoria Centre for Higher Education Studies signifies a major change in our involvement in the University of Melbourne Extension as MSLC staff take on a new role in delivering this program directly to students. 2023 will also see major design work for learning materials in the Next Generation Tutorial spaces as well as new opportunities for developing short-form video content using Lightboard technology.

Regular Activities

Subject Coordination

In 2022, members of the MSLC made a significant contribution to subject coordination of mathematics and statistics subjects, particularly in Semester 1. In each subject where a member of the MSLC was assigned to lecture, they were the subject coordinator. Members of the MSLC coordinated the following subjects in 2022.

Semester	Subject	Coordinator
1	MAST10005 – Calculus 1	Duffy
1/2	MAST10006 – Calculus 2	Tran/Morphett
2	MAST10010 – Data Analysis 1	Fijn
1	MAST10012 – Introduction to Mathematics	Santin Garcia
1	MAST10018 – Linear Algebra Extension Studies	Santin Garcia/Tran
2	MAST10019 – Calculus Extension Studies	Santin Garcia/Tran
1	MAST20026 – Real Analysis	Duffy
1	MAST20031 – Analysis of Biological Data	Fijn
1	MAST90045 – Systems Modelling and Simulation	Saikai

Tutor Coordination

For subjects with enrolment in excess of 150, the MSLC supports subject delivery by staffing the subject with a Tutor Coordinator. The Tutor Coordinator is a link between the tutors and Subject Coordinator and assists the subject coordinator with administrative/setup tasks. In 2022, MSLC staff filled tutor coordinator roles in 13 subjects in Semester 1 and 11 subjects in semester 2, with most of these roles filled by MSLC Teaching Associates.

Small-Class Teaching

During Semesters 1 and 2 in 2022, the School of Mathematics and Statistics delivered more than 500 small group tutorials, labs and workshops per week. In Level 1 and 2 subjects, many of these tutorials are run as whiteboard tutorial model, where students are given questions they had not previously seen/considered, and work in small groups to solve them. In 2022, approximately one quarter of this small-class teaching was undertaken by MSLC Teaching Associates.

University of Melbourne Extension Program (UMEP) / Centre for Higher Education Studies

The UMEP program gives secondary school students the opportunity to extend their studies by undertaking university level subjects. The MSLC coordinates the UMEP mathematics program, which includes two subjects: MAST10018 Linear Algebra Extension Studies, and MAST10019 Calculus extension studies. The program is taught by school teachers, across different locations. In 2022, there were nine school centres, delivering the program to 84 secondary school students. Students undertaking the subject are awarded ATAR increments by the VCAA, based on their results In 2022, there were two major updates to the program.

- The MSLC worked with the UMEP office to re-accreditation of our subjects with VCAA. The subjects are now accredited to run until 2027. This required providing in-depth detail of the learning outcomes and subject delivery in standardised VCAA templates.
- The MSLC worked with the UMEP office in a bid to have the UMEP maths program run in the Centre for Higher Education Studies (CHES), a new Victorian government initiative for senior secondary school students. This bid was successful, and our offering will commence in 2023. This first offering of the UMEP subjects at CHES will be delivered by Dr Alba Santin Garcia and Dr TriThang Tran.

Calculus and Probability Online

For prospective students who do not meet the requirement of VCE 3/4 Mathematics Methods required for several undergraduate degrees at the University of Melbourne, the Mathematics and Statistics Learning Centre runs a preparatory course, Calculus and Probability Online, which covers equivalent material. This course is fully administered and delivered by the Mathematics and Statistics Learning Centre. Throughout 2022, more than 300 students completed the course. Looking ahead to 2023 and beyond, changes in VCE will necessitate updates to the Calculus and Probability Online offering. These updates, which will include updated learning materials, will be developed throughout 2023 to be ready to be deployed in early 2024.

WebWork Design, Support and Implementation

WebWork is an online assessment system particularly suited to mathematics and statistics. It can generate randomised assignments or practice tasks that students complete online and are automatically marked. WebWork is used to provide automated assessment and non-assessed learning activities for students in most of our large first-year subjects. The MSLC coordinates WebWork for the School, including: administering WebWork; maintaining documentation for students and staff; recruiting, training and managing programmers to develop new questions; working with IT to keep WebWork functioning and up to date. In 2022, the MSLC supported WebWork deployment in following subjects: MAST10005 Calculus 1, MAST10006 Calculus 2, MAST10007 Linear Algebra, MAST10008 Accelerated Mathematics 1, MAST10012 Introduction to Mathematics, MAST10022 Linear Algebra: Advanced, MAST20031 Analysis of Biological Data.

Research Student Supervision

- Jiayu Xu, *Analysis of student sampling strategies in Chocs and Blocks activity*. Vacation Scholarship project, supervised by Dr Anthony Morphett and Dr Paul Fijn

Additionally, Dr Yuji Saikai is currently supervising and jointly supervising three MSc theses in statistics.

Grant Supported Development Projects

Next Generation Tutorial Room Development

Funding Amount: $26,460 (University of Melbourne FlexAP Grant)
Funding Period: October 2022 – December 2023

In 2021, the Faculty of Science, on behalf of the School of Mathematics and Statistics, invested $180,000 in the creation of two pilot Next Generation tutorial rooms, each equipped with six large-screen interactive whiteboard

devices. These devices permit students to undertake integrated and seamless workflow between written and computer work, overcoming the artificial separation between computer work in labs and tutorial work in a small-group learning setting.

In 2022, subject development to make use of these upgraded spaces took place in MAST10006 (Calculus 2), MAST10022 (Linear Algebra: Advanced) and MAST10010 (Data Analysis 1). In 2023, further work is planned for MAST10006 (Calculus 2), MAST10010 (Data Analysis 1) and MAST20005 (Statistics). Funds for this project provide administrative support and teaching duty buy-out for academic staff undertaking major revisions to make use of these spaces.

Subject development work on this project to date has been undertaken by a number of MSLC staff in 2022: Dr Alegra Dajic, Dr Paul Fijn, Dr Shelly Levin, Mr Matthew Mack, Dr Anthony Morphett, Dr Robert Maillardet, Dr TriThang Tran, and Dr Paul Williams. Development work has also been undertaken by Dr Lawrence Reeves.

Flipped Classroom Resources for Real Analysis (MAST20026)

Funding Amount: $5,000 (University of Melbourne LTI Blended Synchronous Learning Grant)
Funding Period: 2022
Project Lead: Dr Christopher Duffy

The dual-delivery nature of 2022 provided an opportunity to develop subject materials that give students greater agency in how they work through subject material. Work in this project built upon a set of notes first created in 2021. The final output of this project is a full set of flipped classroom materials (readings and lecture plans) for lecturers delivering an introductory subject in real analysis. The funds for this project provided salary offset and admin support for MSLC staff to create and review these materials and also support their in-class delivery.

Strengthening Learning in Mathematics and Statistics using Video Consultations

Funding Amount: $25,800 (University of Melbourne Learning & Teaching Grant)
Funding Period: 2021-2023
Project Lead: Dr Rob Maillardet

Video Consultations emulate, in a purely online form, the teaching and learning collaborations that occur in one-on-one live consultations with students. They have been successfully used in Mathematics and Statistics. To date students have completed over 10,600 Video Consultation sessions lasting in total approximately 7,000 hours. Video consultations are over an order of magnitude cheaper per study hour than live consultations, a cost which reduces over time given their longevity.

This project established a dedicated School recording studio and funded selected talented research students and sessional teaching staff to prepare and implement high quality new Consultations across 13 subjects with enrolments of approximately 9400, thus doubling the School's resource pool of Video Consultations.

WebWork Resources for MAST10006

Total Funding Amount: $7,500 (FlexAP)
Funding Period: 2021-2023
Project Lead: Dr TriThang Tran

WebWork is an online homework system, designed with the needs of mathematics subjects. This project's goals are to develop WebWork modules that supplement the lecture content, in a way the allows lecturers to focus more on mathematical communication. The modules can be completed asynchronously. In practical terms, we are developing online, self-guided WebWork problems, which students will be directed to complete prior, or after a lecture, depending on the problem. Generally, the problems are short, simple, and target basic skills and misconceptions in the subject.

Students typically only learn good mathematical writing in tandem with learning new mathematical concepts. The redesign would mean lectures can draw on the developed online resources as inspiration for discussion on writing and presentation. Moreover, by moving more routine problems out of the lectures, this frees up some lecture time for

lecturers to use to discuss and target aspects of communication. For example, a student might see limit calculations in a WebWork module, that primes them for discussion in lectures about the importance of the justifications required in steps of the calculation.

The project has the added benefit of allowing students to practise using WebWork, prior to needing to use it for assignments. This aims to reduce the number of technical issues that arise during assignments.

Work on the project is underway, with Dr Anthony Morphett and Dr TriThang Tran having designed 13 problems. The funding allowed us to hire a research assistant, Rohan Hitchcook, to code up the WebWork problems. Work will continue over Summer 2023, for the modules to be ready by Semester 1, 2023.

Student Maths and Stats Help (SMASH)

Funding Amount: $156,867 (SSAF)
Funding Period: 2018-2022
Project Leads: Dr Anthony Morphett/Prof Deb King/Ms Adriana Zanca
Project management: Ms Adriana Zanca

The Student Maths And Stats Help (SMASH) maths skills drop-in service provided support for students from across the university to get help with numeracy and quantitative skills needed for their studies. It helped students improve their mathematical skills, develop basic quantitative and statistical reasoning skills and address gaps or weaknesses in their mathematical knowledge. Support was provided by students employed as peer leaders. SMASH was staffed and managed by students, with students-as-partners in the delivery and management of the programme. SMASH ran from 2017-2022, two years longer than originally budgeted due to running under budget over the first three years of operation.

MAST90045 Lab Class Development

Funding Amount: $150 (School of Mathematics and Statistics Teaching Support Scheme)
Funding Period: 2022
Project Lead: Dr Yuji Saikai

The project was intended to trial real-time collaborative coding exercises using CoCalc, a web-based computing facility, in MAST90045. Learning to code, just like learning mathematics, inherently requires individual exercises, for which the existing computer laboratory classes are designed. The downside is difficulty in sharing and discussing individual attempts. In a physical laboratory, students sitting next to each other may glance at others' work but not work of those sitting apart. It is even more difficult for remote students.

CoCalc provides web-based coding environment in which multiple people can work simultaneously and share their code as well as outputs real-time. The use of such environment can mitigate the solitary nature of coding exercises and enhance the advantage of small classes—participatory discussion. The benefit is even greater for remote students.

In addition to the positive feedback through the SSLC survey, throughout the semester, the instructors and students had lively coding practices, which otherwise would have been difficult to achieve. Since the result was very positive, CoCalc will be employed in 2023 again for further development.

Other Major Projects/Development

Lightboard Studio

Project Lead: Dr Rob Maillardet
Technical lead: Keenan Hellyer (Biosciences)

A lightboard supports video recording whilst facing the audience and writing on a glass board filled with light. This project established two Lightboard Studios (in Peter Hall and Old Geology North) which are fully automated one-touch installations for staff use without professional support. Custom software was also developed from scratch to support three recording modes: lightboard only, lightboard with overlays, and lightboard with overlays plus a separate second video stream.

MAST10007 Lab Class Development

Project Leads: James Clift and Nick Sgro-Traikowski
Support and supervision: Dr Christine Mangelsdorf

Many of the MAST10007 Linear Algebra computer lab class activities had not been updated for many years, and student feedback indicated that some of the activities were repetitive and did not engage students. James Clift and Nick Sgro-Traikowski redeveloped several of the MAST10007 computer lab activities over semester 2, 2022. They wrote several new computer lab activities and substantially updated several others. They focussed on incorporating interactivity and visualisation into the computer lab activities, which they achieved by creating several new interactive applets using GeoGebra and MATLAB. Student feedback about the new computer lab activities was positive, and increased class attendance indicates that the activities were successful in improving student engagement in the computer lab classes.

Scholarly Engagement

Though primarily focussed on supporting teaching and learning directly, MSLC sees an opportunity to make contributions to the Australian mathematics and statistics education landscape through the scholarship of teaching and learning. In the past year, members of the MSLC have shared scholarly work in a variety of venues, and have laid the groundwork for future contributions in these areas through their contributions to mathematics and statistics education research projects.

Contributions to Ongoing Education Research

Investigating the use of electronic whiteboards in small-group classes for teaching statistics

Dr Christopher Duffy, Dr Paul Fijn, and Dr Robert Maillardet

This research aims to understand how to use electronic whiteboards effectively for small-group teaching in statistics subjects. This will be considered by evaluating the extent to which they improve student self-efficacy (attitude and confidence with statistics), foster student engagement, and increase student knowledge of statistics.

Evaluating student engagement with and perceptions of a flipped classroom design for a large statistics subject

Dr Paul Fijn and Dr Alba Santin Garcia

This research is investigating a class taught with a "flipped classroom" design, with main lecture content delivered outside of class (primarily videos) and a heavy focus on interactive and exploratory tasks within the classroom. The focus is on evaluating which modes and tasks students engage with most, and how that translates into effective learning outcomes.

Understanding different conceptualisations of mathematical communication from the first year undergraduate perspective.

Dr Alba Santin Garcia and Dr TriThang Tran

This research aims to understand the different ways in which first year mathematics students experience communication in mathematics. To achieve this, we will interview first year mathematics students from a range of different subjects. The results of the study are intended to inform approaches to improving mathematical communication in our first-year classes.

Learning in Circles (LINC)

Dr Christine Mangelsdorf, Dr Anthony Morphett, Prof Antoinette Tordesillas, Dr TriThang Tran and Dr Binzhou Xia

This research investigates whether studying a real-world application of calculus embedded throughout the semester affects how students see relationships between different mathematical topics in MAST10006 Calculus 2.

MSLC Occasional Seminar Series

The MSLC Occasional Seminar Series a sporadically run seminar series that discusses all matters teaching and learning in mathematics and statistics. Titles from seminar talks for this year are given below.

- Dr Laure Helme-Guizon, (Deputy Director of first-year Mathematics and Statistics, School of Mathematics and Statistics, UNSW Sydney) *The 1001 uses of randomised online questions*
- James Clift and Nick Sgro-Traikovski (School of Mathematics and Statistics, University of Melbourne), *Getting students to link algebra with geometry: a Linear Algebra lab redesign project*
- Dr TriThang Tran, (School of Mathematics and Statistics, University of Melbourne) *A report on NextGen tutorial classes in Calculus 2*

- A/Prof Sue Finch (School of Mathematics and Statistics, University of Melbourne) *Taking care with context: Curating suitable data for teaching statistics*
- Dr Anthony Morphett (School of Mathematics and Statistics, University of Melbourne) *Student Relationship Engagement System (SRES): what is it and what can we do with it?*

Contributed and Invited Talks

Throughout the year, members of the MSLC along with their colleagues contribute their expertise in mathematics and statistics education to external conferences and seminar series. The details of these contributions for 2022 are listed below.

- Duffy, Fijn (2022)*: Next Generation Tutorial Spaces*, Faculty of Science Learning and Teaching Gathering
- Fijn, Huang, James, Maderazo (2022): *Engagement Beyond the Curriculum*, Maths Association of Western Australia
- Santin Garcia (2022): *Whiteboard tutorials @ Melbourne Uni,* UTS Maths and Stats Teaching Seminar
- Morphett (2022): *Exploring infectious disease models with handshakes*, Mathematical Association of Victoria (MAV) Annual Conference

Service and Training

In addition to its activities in Teaching and Learning, the MSLC supported teaching in the School of Mathematics, the University of Melbourne, and external stakeholders through a number of service and training duties throughout 2022.

School of Mathematics and Statistics

Casual Staff Recruitment, Allocation and Training

In 2022, the MSLC allocated over 100 casual staff members to tutoring roles in tutorials, labs, and workshops across more than 50 subjects. This includes 25 new casual tutors who received training in the whiteboard tutorial model heavily utilised in the school. Most of these casual tutors were University of Melbourne masters and PhD students.

In working to clarify the roles and responsibilities of these staff in the school, the MSLC has developed two new position descriptions for casual staff. These position descriptions provide the starting point for conversations about what sort of duties can be expected from these staff under the various categories of work outlined in the Enterprise Business Agreement. A preview of upcoming changes in the Enterprise Business Agreement will likely necessitate changes in how the MSLC allocates and directs the work of casual staff in the tutorial program.

Staff Student Liaison Committee

The Student-Staff Liaison Committee aims to ensure that students' voices are heard in matters regarding teaching and learning in the School of Mathematics and Statistics. Each subject has one or more student representatives. In 2022 there were 144 student representatives. Their principal duty is to provide an accurate picture of student opinions and to be the bridge between the class and the lecturer, ensuring that the feedback is made available to the lecturer in a timely fashion.

A major component of this committee is the SSLC survey, which invites students in Week 4 of semester to give early feedback on the quality of delivery of their lectures, tutorials, labs and workshops. In 2022, the MSLC was invited by the Faculty of Business and Economics to give a presentation on this survey, as they look to implement a similar mechanism to provide feedback for tutors across their schools.

Computer Lab Management and IT Support/Training

Lab Coordinator: Dr Rob Maillardet

The School has three main computer labs with 150 Citrix imaged machines. The MSLC coordinates updates to lab software and day-day operational issues, and oversees the rollout of specialist mathematics/statistics software to core lecture theatres used for our teaching. These core physical resources are supplemented by virtual machines running R/RStudio, Python and Matlab, and during the pandemic students also had direct remote logon access to our lab machines as well as to mathematics/statistics software via *myuniapps*.

With the continued requirement for online classes and the contingency for the possibility of a sudden change back to full remote learning, the MSLC managed the creation of Zoom meetings for over 1000 small-group classes offered by the School in 2022, and their deployment to Canvas sites.

As the school continues to heavily use online tools to manage various aspects of both in-person and online teaching, the MSLC offered training sessions throughout the year on a number of these technologies, including Gradescope and Ed Discussion.

Online Exam Coordination

Due to the necessity of the dual delivery requirements for subject delivery, the School continued to require invigilated online tests in place of in-person tests. The technical and staffing arrangements for Summer 2022 special exams mid-semester tests in MAST10009, MAST20029, MAST90104, and MAST90105 and for lab tests in MAST10007 and MAST10010 were overseen by the MSLC. Across all semesters, over 1,000 students wrote Zoom-supervised exams that were organised and supervised by the MSLC.

First-Year Enrolment Approvals

In order to ensure consistency for enrolment variations across core mathematics subjects, the MSLC manages all requests for enrolment variations in Level 1 subjects. Primarily these requests come from non-VCE students. In 2022, the MSLC handled approximately 400 such requests. As part of this, the MSLC administers online placement tests to assist with determining the most appropriate subjects for a student, in cases when this can't be determined just from the student's academic records.

MS-Teaching/MS-Prime Administration

To meet critical communication needs that emerged during pandemic conditions the MSLC created and maintains two Canvas Communities – MS Prime (main student facing site including all undergraduate and postgraduate students and staff – 9000 plus members – and covers teaching, research and outreach aspects of the School) and MS Teaching (staff facing site which started with online teaching information, then broadened to Teaching information and now further broadening to General Admin information). These sites have become crucial longer-term elements of School Communications. All content is directly maintained by identified page owners and Tile Coordinators support strategic review to ensure that the site remains current and adapts to changing circumstances.

Student class Registration Support

In collaboration with Dr Christine Mangelsdorf, who prepares the University timetable for all mathematics and statistics subjects, the MSLC oversees the class registration process. This includes setting up *MyTimetable* (the student class registration system), an ensuring enough space in each class, and an equitable distribution of students amongst classes. In 2022, as in the previous two years, there was the additional challenge of ensuring the correct balance of available online classes vs on campus classes. In 2022, counting lecture and small class enrolments, there were over 30,000 unique enrolments in Semester 1 and 2, and over 1,600 unique enrolments in Summer. As part of the class registration process, the MSLC processes Timetable Assistance Forms – these are forms that students complete when they need assistance with class registration. In 2022, the MSLC processed approximately 750 such forms.

School of Mathematics and Statistics Committee Contributions

- *Environmental Health and Safety Committee:* Dr Robert Maillardet, Ms Rosie Pingatore,
- *IT/Web Committee:* Dr Robert Maillardet
- *Undergraduate Studies Committee*: Dr Christopher Duffy, A/Prof Andrei Ratiu, Dr TriThang Tran
- *Diversity and Inclusion Committee:* Dr Alegra Dajic, Dr Paul Fijn, Mr Matthew Mack
- *Engagement and Publicity Committee:* Dr Anthony Morphett (Deputy Chair)
- *Research Competition Committee:* Dr Anthony Morphett

Faculty of Science / University of Melbourne

Degree Entry and Advanced Standing Advice

The MSLC provides advice as part of the University of Melbourne admissions process. We assess the mathematics/statistics background of non-VCE applicants into a variety of courses, including the Bachelor of Science and the Bachelor of Commerce. In 2022, the MSLC provided advice for approximately 200 applicants.

In addition to providing advice regarding prospective students, the MSLC also provides advice for the awarding of advancing standing for mathematics and statistics subjects undertaken at other institutions. In 2022, the MSLC provided such advice for approximately 100 students.

Science Day 1/Science Orientation

Each year the Faculty of Science runs a variety of events to introduce new and prospective students to the University of Melbourne. The MSLC coordinates the School's presence at these events, providing staff to attend to student questions and promote the School's offerings.

Faculty/University Committee Contributions

Casual Staff Timecard ad-hoc Working Group: Dr Christopher Duffy
Science Faculty T&L IT Reference Group: Dr Rob Maillardet

External Stakeholders

Professional Development Sessions for VCE Teachers

With changes to VCE mathematics subjects upcoming in 2023, the School's Outreach team coordinated professional development sessions for teachers. These sessions were designed and delivered by members of the MSLC, with additional support from members of the school's outreach team and casual academic staff.

- *An Introduction to Graph Theory*: Designed and Delivered by Dr Christopher Duffy, with additional support from Dr Paul Fijn, Dr Alegra Dajic and Mr Matthew Mack
- *Probability and Statistics*: Designed and Delivered by Dr Paul Fijn, with additional support from Mr Giles Adams, Ms Martina Hoffmann, Ms Meirian Lovelace-Tozer, Dr Anthony Morphett, Mr Chris Selman and Ms Jiami Zhang
- *Logic and Proof:* Designed and Delivered by Dr Anthony Morphett, with additional support from Mr Liam Carroll, Mr Zhongtian Chen, Mr James Clift, Mr Owen Colman, Dr Alegra Dajic, Dr Paul Fijn, Dr Susan James, Mr Jayson Liu, Mr Dominic Maderazo, Mr Santiago Martinez, Dr Yuji Saikai, Dr TriThang Tran, Ms Rebecca Yin

Australian Mathematical Society (AustMS)

Dr Anthony Morphett is a member of the AustMS Standing Committee for Mathematics Education as the Victorian state representative. Anthony's main role in the committee in 2022 was organising the AustMS/AMSI Teaching Seminar Series, a nation-wide online seminar series featuring talks and discussions about any matters related to the teaching of the mathematical sciences in universities.

Mathematics and Statistics Learning Centre
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