
Authentic Teaching and Learning in University Mathematics
L'enseignement et l'apprentissage authentiques des mathématiques à l'université
(Org: **Fok-Shuen Leung** (University of British Columbia) and/et **Vanessa Radzimski** (University of the Fraser Valley))

CARMEN BRUNI, University of Waterloo
Lessons Learned From a Graduate Student Seminar

Graduate students spend a large majority of their degree receiving technical training in doing research mathematics. What is somewhat underemphasized is that these students also must give presentations and eventually teach classes. Often times, students receive very limited training in these facets of their degree, especially from trained mathematicians who's role it is, in part, to give these talks in their discipline. To help bridge the gap in training, we discuss a seminar for graduate students looking to teach their first course that a group of colleagues developed in the Faculty of Mathematics at the University of Waterloo. It ran for the first time in winter of 2018 and we are running it again in winter 2019. This was based on experiences gained in part from a similar course offered at the University of British Columbia.

I will discuss our seminar format, including micro teaching sessions, practicum, assessment design and presentation skills. I will also discuss some of the challenges of this seminar and some of the ways we are trying to overcome these difficulties. Lastly, I will talk about some improvements we will be making from the first to second iteration based in part on instructor training received at the 2018 CoMInDS workshop in Orono, Maine.

This is joint work with Brian Forrest, Diana Skrzydlo and Dan Wolczuk at the University of Waterloo and with Fok-Shuen Leung at the University of British Columbia.

MATTHEW COLES, University of British Columbia
Professional development of novice math instructors: Encouraging the adoption of authentic teaching

Graduate student and postdoc instructors teach many of the 1st and 2nd year mathematics courses at large research institutions. These instructors come into their positions with a wide range of training and experience. We will discuss some of the professional development activities in place to support novice instructors at The University of British Columbia. We will highlight, in particular, the new Instructor Support Group (ISG) - a community of practice where instructors make improvements to their day-to-day teaching in a peer setting. Our tools to help instructors adopt modern techniques include: student feedback, peer feedback, self reflection, and goal setting.

LAUREN DEDIEU, University of Calgary
Emphasizing Mathematical Communication in the Classroom

A crucial part of a mathematician's job is to find the best ways to communicate their results both verbally and in writing. However, many of our students tend to view communication and mathematics as two distinct entities. In this talk, I will discuss my experiences with incorporating mathematical communication into my undergraduate mathematics courses. I will outline the types of assignments and activities I have used, my motivation for using them, and students' reactions to them.

VESELIN JUNGIC, Simon Fraser University
Sweet and Sour: Teaching Mathematics to Engineering Students

In this presentation I'll describe my experience with teaching a course on vector and complex analysis that is offered to engineering students at Simon Fraser University. The questions that I will address include: Why such a course? Content vs. rigour? Rigour vs. applications? What is instructor's role as a promoter of advanced mathematics to future engineers?

FOK-SHUEN LEUNG AND VANESSA RADZIMSKI, University of British Columbia and University of the Fraser Valley
A New Blended Model for Small-Scale Learning in Large-Scale Classes

We describe a four-year old blended model for team teaching, in which three weekly lectures are replaced with a single faculty-led lecture and two smaller graduate student-led classes. This teaching model blends the benefits of small classes and active learning (Hake, 1998), while maintaining the pedagogical and pragmatic benefits of lectures (French & Kennedy, 2016). We review comparative, quantitative results on the impacts of implementing the recitation model in a section of first-year integral calculus. Our data suggests that this innovative, blended teaching model has a significant positive impact on students' final exam marks, as well as their attitudes towards mathematics. Furthermore, we argue that our blended model benefits administrators with its resource-lean nature and may benefit graduate students in their pedagogical development.

GARY MACGILLIVRAY, University of Victoria
Mentoring undergraduates in research

The following questions will be discussed. What does mentoring mean? What does a mentor do? Who are the students and how do you come to work with them? What are the learning outcomes? How will you work together? How is the project chosen? What assures that the project is feasible and that progress can be made? What constitutes a successful outcome? Is it research?

COSTANZA PICCOLO, University of British Columbia
An intervention for students at risk of failing their first University Calculus course

In this talk I will describe an intervention aimed at providing early support to students at risk of failing their first University Calculus course. I will discuss our approach for an early identification of the "at-risk" students and describe the design and implementation of a series of optional study sessions focussed on strengthening students' self-regulatory skills.

PATRICK WALLS, University of British Columbia
Open Source Mathematical Computing in the Cloud with Python, Jupyter and Git

Most undergraduate courses on mathematical computing are based on proprietary software tools such as MATLAB, Maple and Mathematica, however many mathematicians go on to work as data scientists where open source tools such as Python, Jupyter and Git are industry standards. In this talk, I will describe the redesign of MATH 210 Introduction to Mathematical Computing at UBC based on open source software and principles of student-centred course design.