
Designing and Delivering Mathematics Courses Online
(Org: **Brian Forrest** (Waterloo))

TREFOR BAZETT, University of Victoria
Designing Engaging Math Videos

How can we make online videos that are as engaging as our best face-to-face lectures? In this presentation we will first discuss the creation of videos, focusing on the pedagogical choices and evidence-based tips for increasing engagement. Second, we will discuss the roles video can play in the larger learning process and how to structure online modules that include videos as a component.

For video creation, we will discuss several best practices from the literature to promote engagement such as optimizing cognitive load, length and pacing, the use of storytelling techniques, and a learning objective-centric approach. We aim to leverage the opportunities of the video medium while mitigating the challenges.

Even with very engaging videos, they still need to be appropriately scaffolded in the learning process, often in online modules that contain multiple components alongside the video. We will discuss several strategies for integrating videos effectively with our other content and providing meaningful incentives and feedback to students. We will contrast the use of videos in largely asynchronous online courses, blended pedagogies such as flipped online classrooms, and even as supplements in largely synchronous online courses.

FRANCOIS BERGERON, UQAM
Exploiting virtual backgrounds for livelier presentations

In Zoom based presentations, one may readily turn the virtual background into a slide projector. This allows a direct interaction between the presenter and the material presented, while staying very simple to set up. I will explain how to do this, and illustrate. In the discussion period, I will briefly mention that other more flexible approaches do exist (Zoom+OBS). However, they are rather more technical in their implementation.

PETRA BONFERT-TAYLOR, Dartmouth College
Remotely Teaching Scientific Computing ... with three weeks' notice ...

In the current remote environment, many students are lonely and desperate to engage with course content and each other, but they have a hard time doing so without guidance. Speaking up to ask questions is even more difficult for most in this setting than it is in a classroom setting. Students won't easily admit they need help and thus, even in small groups, collaboration needs to be guided with a heavier hand.

These are some of the lessons I learned this past term when teaching my Scientific Computing class (which introduces C and MATLAB) remotely. The video describes the techniques I used to engage students and to attempt to build a social network for them at the same time.

CARMEN BRUNI, University of Waterloo
80640 - Fall is Coming

In 2018, I was commissioned to design an online version of our first year second term introductory Python programming course CS 116. In this talk, I will share some of my experiences with developing this course as well as many lessons learnt along the way in hopes that you can avoid my mistakes and to help you save time while redesigning your course for the upcoming online term.

GUSTAVO CARRERO, Athabasca University

Individualized study as a relevant mode of teaching mathematics courses remotely during the COVID-19 pandemic

In this presentation, I will provide an overview of the individualized study method of teaching mathematics remotely at AU (Athabasca University), a Canadian university that specializes in online distance education. I will describe two important aspects of an individualized course in mathematics at AU, namely its development and its delivery, and how the effectiveness of these aspects depends on a human component (a team of professionals and academics), and a software component (a learning management system). Finally, I will discuss the relevance of the individualized study mode of teaching mathematics during the COVID-19 pandemic, and how this distance education method has been affected by the pandemic.

SHAWN DESAULNIERS, University of Alberta

Enhancing Student Success with Reverse Course Design

Remote teaching is new to most of us. This unprecedented move has not only caused instructors to change how they will teach, but it also requires students to change how they will learn. In this presentation, we discuss some of the benefits of reverse course design and asynchronous learning for both instructors and their students. In particular, we recommend beginning with a holistic vision of the course and how it will impact the students' lives. From there, instructors can then develop a clear understanding of what they expect the students to be able to do upon completion of the course, decide how they will (remotely) determine whether or not the students can do these tasks, and then create resources that help the students succeed in this new learning environment.

REBECCA NOONAN-HEALE, University of Utah

Teaching Synchronously Online – Design and Experience of a Course Intended to be Taught this Way

Teaching a synchronous online course where students know at the start what to expect is a vastly different experience from everyone being forced to transition mid-semester. The combination of students choosing to take the course and establishing an interactive classroom culture early on makes it a more positive experience for all.

This talk is about my experience designing and teaching a synchronous online course taught through Zoom in Summer 2020. I cover the structural choices made to respond to the fact that students would be participating from locations with unique limitations, such as homes, cars, or wi-fi hot spots. I also describe small and big activities that leverage the features of Zoom to help students actively engage with the material and each other. Finally, I include some surprising advantages that synchronous online learning has over in-person learning.

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ZOHREH SHAHBAZI, University of Toronto Scarborough

Teaching University Calculus Online

In this talk, I will describe my plan for using the developed videos and material to teach a first year calculus course online.

DAN WOLCZUK, University Of Waterloo

Promoting Student Engagement in Online Courses

Student engagement is a primary concern in all courses. High levels of student engagement are linked to greater academic performance and increased satisfaction, while low levels of student engagement are linked to higher drop-out rates.

Thinking about student engagement in online courses is now more important than ever. Due to Covid-19, we will have numerous students enrolled in our online courses who have little to no interest in taking online courses. Maintaining these students' engagement is paramount.

In this presentation, I will discuss some tried, tested, and true techniques for increasing and maintaining student engagement in online courses.