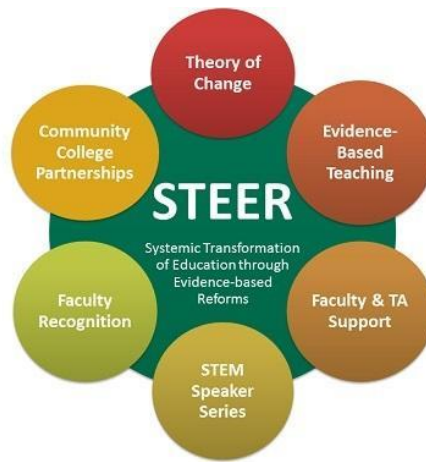


Steering Online Success in STEM (STEER SOS)

Strategies, tactics, tools, and workarounds for teaching of online/remote courses



The Covid-driven switch to online/remote instruction during the spring 2020 semester presented significant challenges to instructors of STEM courses at USF. Many, if not most, had no prior experience in online instruction and had to scramble during spring break to learn enough to convert their courses to an online format. Many applied creative teaching strategies, adapted existing tools and developed creative workarounds to meet this challenge.

The STEER (Systemic Transformation of Education through Evidence-based Reforms) group at USF/HCC thought it would be helpful to solicit STEM faculty to produce short videos describing their approaches to online instruction and thirty-five science and engineering faculty answered the call. Links to their videos are provided below and cover a wide range of topics including the use of virtual laboratories, short “how-to’s” for various apps and technology, online assessment, engaging students, and many more. We encourage you to explore them for content of interest to you and we hope that you find them useful in further developing your online teaching skills.

You can simply scroll through the document or use the index on the next page to jump to videos that address particular topics. There are “Index” links at the top and middle of each page to return to the index.

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Chemistry

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1. Sherrisse Bryant

(1) Canvas modules (2) McMillan Learning Achieve Platform (3) Weekly Youtube videos.

<https://youtu.be/k6YPDuLnJRw>

2. Daniel Cruz-Ramírez de Arellano

(1) How to record lecture videos and step-by-step practice problem videos using the iOS application "ExplainEverything" (0:45) (2) How to upload lecture videos to Kaltura on Canvas so that closed captioning is generated for the video (10:30) (3) How to schedule and publicize on Canvas office hour sessions on Microsoft Teams (16:24)

<https://youtu.be/gW674Swe9xQ>

3. Kenyon Daniel - CMMB/Chemistry

(1) Taking a flipped course to fully online. Opportunities and considerations. (2) Take Canvas Conferences to the next level with breakout rooms.

https://youtu.be/d_pJfyg0zII

4. Dave Flanigan - HCC Chemistry

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(1) Using an iPad in whiteboard mode to augment an online lecture in Zoom (9:49).

<https://youtu.be/kisTT7yYxl4>

5. Ushiri Kulatunga

(1) Deploying dummy Canvas courses for each Peer Leader to meet with students.

(2) Training of Peer Leaders using Blackboard Collaborate Ultra.

<https://youtu.be/mARyMfLKcO4>

6. Solomon Weldegirma

(1) In-house videos of organic experiments run by trained TA's. (2) In-house video demos of organic lab equipment and instruments run by trained lab technicians. (3) In-house video demos of organic lab safety procedure run by trained lab technicians.

<https://youtu.be/Rv4m8Lu0fbE>

Integrative Biology, Biological Sciences and CMMB

7. Johnny El-Rady – CMMB

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I humbly share with you elements of a successful move to online instruction. (1) Assessing attendance and participation (2:10). (2) Administration of online exams (9:30); and (3) Making novel use of office hours (16:50).

https://youtu.be/IQjx_qLVZdk

8. Colbi Gemmell - CMMB

(1) Engaging students in synchronous group inquiry-based activities specific to Bio I lab in an online setting. These activities focus on scientific writing, experimental design and data analysis (0:36). (2) Utilizing online laboratory simulation platforms to allow students to gain remote experience with and knowledge of the methodologies they typically would utilize in a face to face biology lab setting (3:40).

<https://youtu.be/cwuaz6RPvoQ>

9. Chantale Bégin – Integrative Biology

(1) Using Panopto webcast for hyflex courses (at the beginning); (2) Uploading exams from Testgen (or other exam writing software) to Canvas rather than writing exam questions within Canvas (4:15)

<https://youtu.be/bVfLcm-h4K4>

10. Deb Ghosh - HCC Biological Sciences

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Three focus areas for moving online: (1) Humanistic approach to instruction and communication (2) Interactive teaching with the Wacom pen for any device (3) online labs

<https://youtu.be/950tCZUCw84>

11. Mary Mangiapia – Integrative Biology

(1) Labster (2) Jove (3) iNaturalist (4) Use of custom made dissection kits

<https://youtu.be/nFY58rEvhvI>

12. KT Scott – Integrative Biology

Use of GIMP shareware for image analysis. In MCB4404L, we used this shareware to analyze transmission electron micrographs. We measured the abundance of bacterial microcompartments in cells cultivated under different conditions. After a little training, students successfully used this shareware to complete their projects online. GIMP is easy for students to use and could be adapted to any sort of image analysis project.

<https://youtu.be/T6YrF7DS8FI>

Geosciences

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13. Chuck Connor

(1) Using javascript and html to enliven content enhance student interaction. (2) Using examples that students would not normally encounter - but which work well remotely. (3) Presenting students with a variety of content formats (web content, PPT, remote lecture) and rapid feedback.

<https://youtu.be/mmUChpns0Go>

14. Joni Downs Firat

(1) Virtual field exercises in wildlife research techniques and wetlands environments.

<https://youtu.be/Xi0SmTqxmAk>

15. Jennifer Collins

(1) Slido. Slido allows you to poll the class easily and the class can see live feedback (similar to the clicker). It is free to the students, but a small charge to the instructor or department or university. Poll them on content to make sure they understand it, ask them to brainstorm and immediately see all their written ideas.

<https://youtu.be/L0ht42EuNsc>

Mathematics and Statistics

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16. Robert Connelly

<https://youtu.be/hXK6Cto13iw>

(1) Gradescope for assessments and rubrics - especially for hand written assignments. (0:00) [<https://youtu.be/hXK6Cto13iw>]

(2) Discord for group discussion and office hours.

(6:40) [<https://www.youtube.com/watch?v=hXK6Cto13iw&feature=youtu.be&start=400>]

(3) Using a "pen" monitor.

(11:16) [<https://www.youtube.com/watch?v=hXK6Cto13iw&feature=youtu.be&start=676>]

(4) Integrate Kaltura questions into lecture videos.

(13:30) [<https://www.youtube.com/watch?v=hXK6Cto13iw&feature=youtu.be&start=810>]

17. Scott Grizzard

(1) How to use OBS to place your face in front of a virtual whiteboard. (2) How to integrate animations from various sources into your live lectures. (3) How to use a TA to manage live chat during a virtual lecture. (4) How to live stream using a virtual camera to any platform (teams, discord, youtube, or twitch).

https://youtu.be/GTJpbe_UWPY

18. Vladimir Grupchev

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Using technology (i.e. iPad Pro and Zoom/MS Teams) to: (1) Record handwritten class notes for posting (2:00). (2) Deliver "live" class sessions through Zoom/MS Teams (7:34). (3) Grade handwritten assignments on Canvas (9:08).

<https://youtu.be/X8nmh43lvY8>

19. Marian Hernández-Viera

(1) How to record a lecture by mirroring an iPad to a laptop (1:31). (2) Useful features of Microsoft Teams (4:54). (3) How to create a Proctorio quiz in Canvas (7:57).

<https://youtu.be/k9SydEsqZY>

Physics

20. Tony Buonaquisti - HCC

(1) General Tips (0:46). (2) Training, Quizzing and Testing (2:03). (3) Zoom Office Hours and Tutorials (4:21). (4) Online Labs (5:41). (5) Future Possibilities (8:31).

<https://youtu.be/C7WRA6DRwno>

21. Martin Muschol

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(1) Powerpoint for structured off-line presentations (1:40). (2) Use of Canvas Kaltura to assess student comprehension (4:03) (3) Use part of traditional "class time" for online Q&A session (4:56) (4) Use of document cameras (5:25) (5) Online office hours with MS Teams (6:02) (6) Exams in advanced courses (7:54)

<https://youtu.be/3LbVP7jdnYs>

22. Gauri Pradhan

Canvas tools used to good effect: (1) Announcements - frequent info and reminders (04:09). (2) Discussion Boards - informal gathering place for questions and comments (03:16). (3) Conferences - meeting with students (02:09) (4) Blackboard Collaborate Ultra - for synchronous interactive discussions/lectures: Whiteboard, files sharing, and recording (04:24).

<https://youtu.be/S7xlmPUqSPo>

23. Jessica Wilson - HCC

Canvas approaches and tools (1) Demonstrations (2) Screencasts (3) Online discussions (4) Online quizzes (5) Zoom (6) Tests

<https://youtu.be/5wVOD73NcMU>

24. Gerald Woods

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Teaching General Physics Labs in an online environment: (1) The structure of a typical module. (2) Activities to supplement student learning in the subject and to increase their knowledge in data analysis. (3) Simulations and home-made video guides to mutually connect and better adapt to online learning: Getting that in-person feeling.

https://youtu.be/8eexLR_r-7o

Chemical, Civil, Industrial and Medical Engineering

25. Olukemi Akintewe - Medical Engineering

(1) Online Lab modules. (2) Assessment. (3) Discussion boards

<https://youtu.be/tWNkYv6F38U>

26. Venkat Bhethanabotla - Chemical Engineering

Comparing pre- and post- transition to online instruction because of Covid.

(1) Proctoring (2) Student performance (3) Lectures

<https://bit.ly/38v2L5o>

27. Achilleas Kourtellis - Civil Engineering

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(1) Synchronous and Asynchronous lecture delivery (2) Using MS PPT with narration (2:23) (3) Using Teams to Deliver Lectures (6:30) (4) How to structure online exams/quizzes (8:50)

<https://youtu.be/cS46Y1wP5iY>

28. Kingsley Reeves – Industrial and Management Systems Engineering

Three tools for online teaching: (1) Panopto, (2) Tablet/pencil, (3) Proctorio

https://youtu.be/e_Lis2on3T8

Computer Science and Engineering

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29. Alessio Gaspar

This video discusses several strategies that have been used to convert introductory programming courses from a face-to-face delivery modality to online asynchronous, then synchronous ones. After an introduction (00:00), we review the outline of the presentation (01:40) then go into the four topics covered; (1) Structuring the contents, presentation, & pedagogy of the online student's experience (05:12), (2) Fostering more unsupervised active learning opportunities (10:20), (3) Adapting what already works Face-to-Face (23:50), and (4) Leveraging what works even better online (31:26)

<https://youtu.be/AvUSMxGbMqc>

30. Paul Rosen

This video discusses using peer feedback to increase student engagement in STEM courses. (1) The first half of the video includes a brief description of peer feedback strategies and benefits, and the second half contains a (2) comparison of platforms for conducting peer review, including Canvas (4:51), Kritik (6:55), and GitHub (10:40).

<https://youtu.be/H7T4WvBuVB0>

Electrical and Mechanical Engineering

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31. Jonathan Gaines - Mechanical Engineering

(1) Campuswire (2) Balancing synchronous and asynchronous instruction. (3) teaming.

https://youtu.be/K7pT0K_pIVc

32. Rasim Guldiken – Mechanical Engineering

How to record and edit class lecture videos on iPad and Notability app:

(1) Enabling the native screen recording in iOS (00:20) (2) the Notability app (1:05) (3) Instruction details for pre-class, during class, after class for before and during the pandemic (1:55) (4) Check whether the students have watched the assigned weekly videos and accessibility of the discussion board for each module (3:00) (5) Active learning exercises via synchronous sessions by Blackboard Collaborate Ultra (3:40).

<https://youtu.be/xMgW7EBirWk>

33. Autar Kaw - Mechanical Engineering

(1) This video shows you how you can use Microsoft forms as a personal response system (clickers). We take you through four steps - how to make a quiz, options in settings, how to share, and how to see the responses. A companion blog is at <https://autarkaw.org/2020/06/13/using-microsoft-forms-as-a-personal-response-system/> This blog has links that will walk you through the basics of making a quiz and how to incorporate equations.

<https://youtu.be/BH8c8V4vDvo>

34. Ajit Mujumdar - Mechanical Engineering

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This video presents information about online teaching tools, delivery modes and feedback/evaluation for a remote Instruction Delivery Method.

(1) At 2:30 in the video, use of a surface device with a stylus or a desktop with an inexpensive XP-pen to write on powerpoint slides either during a live synchronous session or during pre-recording of lectures is illustrated. (2) At 5:50, content delivery using Microsoft Teams is discussed. Live sessions are recorded and posted on the discussion section of the course page. (3) From 6:50 of the video, the capabilities of LMS Canvas are demonstrated for content evaluation using several platforms such as discussion, live session chat, feedback on graded work as well as automatically graded quizzes.

<https://youtu.be/dQlweq-F6sY>

35. Ismail Uysal - Electrical Engineering

(1) Using Canvas Modules Effectively.

<https://youtu.be/8aaEbdbF430>