Department of Industrial and Operations Engineering Remote Learning Task Force Recommendations FINAL REPORT (EXTERNAL)

July 8, 2020

Task force charge: Report on best practices for supporting remote learning, providing flexibility for faculty and consistency for students.

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Introduction

The goals of the task force were to develop best practices for supporting remote learning. As part of this charge, the task force wanted to provide freedom for faculty to innovate and experiment in a given course, while providing a consistent, high-quality educational experience in a way that is inclusive for all students. To meet these objectives, the best practices were categorized into Norms and Recommendations. The section on Norms provides a set of consistent expectations for our community to support a quality education with equity and inclusion considerations. Norms should be followed by all teaching team members and students. The section on Recommendations provides references to best practices and guidelines for developing on-line and hybrid courses. The recommendations are not required, but provide guidance as teaching staff develop their courses and for students taking the courses.

Information from the University of Michigan and the College of Engineering indicates that all classes should be prepared to provide remote education for the fall term. There are opportunities for some courses to have face-to-face classes depending on the size of the class and type of course. If face-to-face opportunities are available to your class in the fall and you are uncomfortable being on campus in this manner, please make your department head aware of your concern. Procedures are being developed by the College of Engineering to support the public health of our community.

As you begin to develop your course for hybrid and remote learning, know that you are not alone. There are a wealth of resources available within the department, college, and university to support course development. Table 1 provides initial contacts for assisting you in developing your course. If you need support for a specific tool or capability that is not listed, reach out to <INSERT IT CONTACT>.

Table 1. Contacts information for course development support

Type of Support	Lead Contact Person	Email
Student support for recording videos and uploading content to Canvas	<INSERT CONTACT>	<INSERT EMAIL>
Setting up a Canvas page	<INSERT CONTACT>	<INSERT EMAIL>
General IT questions	<INSERT IT CONTACT>	<INSERT EMAIL>
Nexus 1-on-1 Consultations	Nexus Help & Support	NexusDesign@umich.edu

Norms

This section provides the Norms developed to support both the teaching staff and students. Norms provide a set of consistent expectations for our community to support a quality education with equity and inclusion considerations. Norms should be followed by all teaching team members.

Norms for Teaching Staff

1) **Course Design and Assessments**

   a) **At the beginning of the term, faculty should poll students for their relevant time zones.** The time zone information should be used to support accommodations for synchronous interactions, such as Office Hours. Accommodations could be made in an asynchronous or synchronous manner.

   b) **All courses must have asynchronous capability, with asynchronous lecture material posted a minimum of 24 hours before the nominal class time for that material.** Not all students will be able to return to campus and not all students will have access to connectivity or an environment that enables live viewing.

   c) **Recorded material for an asynchronous lecture (or a synchronous section) should not go beyond the allotted length of class.** We need to be respectful that students have other courses and requirements on their time.

   d) **Courses should have a synchronous component that can be a discussion section, office hours, or student study hours.** These hours should be selected to support students in different time zones. Synchronous sessions provide an opportunity for students to connect with the teaching staff and their peers to ask questions and work through additional example problems. These sessions do not need to be recorded, but all content must be made available to those that cannot connect into the synchronous time. As examples, the content can be summarized and posted on discussion boards, worked examples posted within the course Canvas page, or additional supplementary video content created and posted. These synchronous sessions cannot be given a grade for attendance as some students may not be able to attend due to connectivity or environmental limitations. There may be a need for multiple synchronous sessions that may be led by different members of the teaching team.

   e) **Additional time for an individual GSI/IA should not be expected beyond their defined hours.** Individual GSI time (or IA time) has not been increased and fractional time calculations and hourly limits are still in place. If additional GSI/IA

support is not provided for a class, <u>faculty will end up devoting more time to teaching than they may have in the past.</u>

f) **Handwritten examples should be recorded using a tablet interface and should not use a whiteboard.** Even though some classrooms are becoming available to record content, it is quite difficult for students to see writing on a whiteboard. A tablet device is being provided to teaching staff to support handwritten interactions for lectures and office hours. Reach out to <INSERT IT CONTACT> to obtain a tablet for your teaching.

g) **All courses must have a Canvas page to organize course content.** Using the same course management methods across the department will support consistency and ease of access for the students. Nexus provides a [template](#) for courses and [instructions on how to import](#) to your Canvas course. Nexus has additional information on their [Canvas resource page](#).

h) **The syllabus, as well as all lectures, assignments, [honor code](#), and additional material must be linked on the Canvas page.** Providing an organized structure for materials makes it easier for students to find material and complete assignments.

i) **Make collaboration expectations known as part of your syllabus.** Faculty have the flexibility to allow different types of collaboration in their courses, which can make collaboration confusing for students. It is important to make your expectations known in your syllabus. Here are some examples to consider:
   ● If students develop code in your course, let students know if they can share code snippets to help peers debug in a remote setting.
   ● Many students are used to showing their assignments to peers to help find their error, which may be as simple as a dropped negative sign. Let students know if they can scan and share assignments with friends as they are working through their solutions.

j) **All assignments must be submitted electronically.** Since interaction with students will be limited, all assignments must be collected and returned digitally. Online grading can be supported through [SpeedGrader](#) in Canvas directly, or through [GradeScope](#).

k) **Accommodations should be made for students as recommended by the C.A.R.E. center.** Students may reach out to C.A.R.E. center for a variety of reasons. The center will send information to instructors on how to support the student. For situations that do not require C.A.R.E. center support, faculty should be supportive and accommodating of student needs. Faculty may suggest

students can reach out to the C.A.R.E. center, or may reach out to the [C.A.R.E. center themselves to report a concern](#).

2) **Office Hours and Student Questions**
   a) **Synchronous contact with students should be provided by the teaching staff.** Contact with students can be office hours, student team meetings, or discussion sections. <u>Office hours will remain remote even in the case of hybrid teaching as offices are typically small and multiple students may have questions.</u> Questions posed in office hours should be documented and provided in an easily accessible way through the Canvas page (i.e., a linked summary document or Piazza forum). Frequency and length of office hours is left to the discretion of the teaching team.

   b) **Include on your Canvas page and Syllabus your frequency with responding to questions from email, Piazza, Discussion boards, etc.** It is important to be transparent so expectations of the students are appropriate.

   c) **Responses to student email questions (that adhere to student norm 4a below) should be within 24 hours on a weekday barring medical or other emergencies.** It is important to provide a response within a timely manner, especially in remote settings. If you do not have the answer and need additional time to find the answer, respond to the student to let them know you are looking into their question.

   d) **Student questions emailed on a weekend should be responded to by the end of the first workday of the week.** While emails do not need to be answered on weekends, it is important to respond within the first day of the week.

   e) **If using Piazza or a Discussion board in your class, set clear guidelines on when you will respond to questions.** Some students may expect you to respond to Piazza questions within hours. This expectation is inappropriate and can be cleared up by making your policy clear on Canvas and in your Syllabus. You could determine that you respond within a 2 hr block every week, or specific time(s) across the week. You have the flexibility to define these terms, but the terms must be available and you should be available to respond at least once per week in these formats.

Norms for Students

3) **General**
   a) **The College of Engineering [Honor Code](#) applies in all academic settings and should be followed.** All students are presumed to be decent and honorable, and all students are bound by the College of Engineering Honor Code. You may not seek to gain an unfair advantage over your fellow students; you may not consult, look at, or possess the unpublished work of another without their permission (including third-party online databases); and you must appropriately acknowledge your use of another's work. Additional guidelines on documenting your acknowledgement of the honor code will be provided by individual courses. If you are unsure about applying the honor code to a particular situation, ask for clarification from the teaching team.

   b) **Course material should not be posted publicly without faculty permission.** Course material is provided for the students within the class and should not be shared beyond the class without permission.

4) **Asking Questions**
   a) **When sending an email question to the teaching staff, the subject line must contain the number of the class (e.g., [IOEXXX: Email Subject]).** Your teaching staff may be teaching more than one class this term and are receiving emails from other projects in which they are involved. Providing the header permits faculty to more easily find and respond to your question in a timely manner.

   b) **Personal questions (e.g., turning in late assignments, missing an exam) should be communicated via email.** Do not use Piazza or Canvas discussion boards to communicate personal information to your teaching staff.

   c) **If you have a religious observance, family obligation, or research conference that conflicts with an assignment or exam listed on the syllabus, notify the teaching staff within the first 2 weeks of the term.**
   d) **If you become sick or have an emergency in your family that arises and conflicts with an assignment or exam, provide the teaching faculty with notice as soon as possible.** If you have a scenario where you need support, reach out to the C.A.R.E. center (https://care.engin.umich.edu/). They are the central hub to assist engineering students in successfully transitioning through a variety of challenging circumstances, both inside and outside of the classroom.

Recommendations

This section provides the Recommendations developed to support both the teaching staff and students. Recommendations provide references to best practices and guidelines for developing on-line and hybrid courses. The recommendations are not required, but provide guidance as teaching staff develop their course.

Recommendations for Teaching Staff

5) **Course Design**

   a) **Lecture content should be pre-recorded and provided asynchronously by linking to the video on the course Canvas page.** Providing pre-recorded lecture material enables a higher audio and visual quality and mitigates issues due to connectivity. Videos can be uploaded directly to a Canvas folder, linked automatically within Canvas (based on the software for recording), or placed on a private YouTube channel. Note that some students with very poor connectivity may benefit by having a USB storage drive with all lecture content sent to them directly to avoid high bandwidth downloads. These students can also work with the College of Engineering to support methods for improved connectivity. <u>You may want to put a copyright statement at the beginning of your lecture and slidedeck to provide opportunities for requesting your material be removed from third-party websites if a student uploads them elsewhere.</u>

   - Recommended wording: "© Copyright 2020, Professor Name, IOE Department, University of Michigan"
   - Note that more information on a [flipped classroom is available from CRLT](#).
   - Streaming video makes it more difficult for people to capture and upload content to a third party site. However, streaming is also more difficult to access for those with poor internet connectivity.

   b) **Pre-recorded videos should be created in smaller segments than a typical class period.** By segmenting lectures, the files become easier to download and easier for students to watch independently. It is important that when pre-recording videos you do not use more than the regular class time (e.g., for a 90 minute class all segments for a single lecture should be less than 80 minutes). However, it is ok for modules associated with a lecture to be less than the typical course lecture time. Without the synchronous interaction with students, it is common that the material can be effectively presented in less time.

   c) **Asynchronous lectures should begin to be recorded over the summer months.** By recording lectures over the summer, more time can be spent during the term supporting the additional synchronous and asynchronous needs of the course. Recordings can be made at home or at studios set up on campus.

d) **Timely viewing of asynchronous lecture material can be supported by faculty by providing a small percentage of the grade to a form of student engagement.** The engagement could be a response to an embedded question in the video, a question they post and submit on a discussion board (Canvas or Piazza), a simple online Canvas quiz, or other alternate assessment. The activity should be a low-stress way to encourage participation in the course.

- Note: If you plan to use Canvas quizzes, it was reported that students should use Google Chrome. If a different browser was used, students had trouble with "Multiple Dropdowns" questions. To make these quizzes more accessible across platforms, these types of questions should be avoided.
- Additional information on making [accessible quizzes](accessible%20quizzes).

e) **If you use student teamwork in your course, we recommend continuing to use this mode of interaction.** Students value the peer-to-peer interaction and would benefit by keeping this interaction modality. If teams are defined by the teaching staff, timezone should be included as a factor in team selection. There are University of Michigan tools for developing teams and supporting team peer evaluations at varying frequencies:

- CATME (https://caen.engin.umich.edu/classrooms/tools/catme/)
- Tandem (https://teamsintandem.com/welcome)

Additional information on creating groups and group assignments in Canvas are available.

- [Canvas Instructor Guide](Canvas%20Instructor%20Guide)
- [Managing Group Assignments in Canvas](Managing%20Group%20Assignments%20in%20Canvas)

f) **If you do not use teamwork in your course, we recommend providing opportunities for students to form study groups.** It may be difficult for students to develop their own groups in courses where they are not familiar with other students. Encouraging students to form study groups and providing pathways for developing groups can support their formation. Canvas enables students to form their own [self-selected groups](self-selected%20groups) or groups could be formed through self-organization on a Piazza or Canvas discussion board by providing a prompt for students to start the discussion.

g) **Set clear guidelines in your class on your preferred communication pathway for technical questions.** Make sure your syllabus states whether your course wants technical (non-personal) questions submitted via email or on a course discussion board. Be flexible as not all students may feel comfortable with a particular pathway.

h) **Set aside time during your first lecture to describe to your students how the course is organized, where you are storing content, and what your expectations are for submitting assignments.** While all classes will have a Canvas page, there may be differences in the organizational structure.

i) **Students should have the flexibility to select whether they want their videos on or off.** A student may not feel comfortable showing their video, or may not have connectivity that permits video streaming. If video streaming is not selected, students may be encouraged to have a current photo that is shown in the absence of the video.

6) **Student Assessments**

a) **Leverage the use of weekly low-stakes assignments to support student engagement and the use of alternate assessment strategies.** Using frequent low-stakes assignments provides a way for students to receive more feedback and can support motivation, as well as timely interaction with the course material, without adding too much stress. Example weekly assessments can include online quizzes, discussion board responses, and/or homework assignments. Note that online quizzes can be configured to be open for a window of time to encourage timely responses. Depending on the material, methods for auto-grading may be appropriate.

b) **Exams should be designed to assess learning objectives using an untimed approach.** Exams provide a source of increased stress when internet connectivity becomes a factor. Students should not be tempted to go against the Honor Code by the format of the assessment. It is encouraged to design open book/notes exams that can be completed over a multi-day time frame (i.e., greater than 24 hours). Be respectful when designing any take home exam. Students are in multiple classes and it is important to respect that they have other commitments that take time. Another option to reduce stress, while encouraging students to meet learning objectives, is to post a superset of questions prior to the exam from which their actual questions are drawn. Additional [alternate assessment strategies](#) are provided by Nexus. Some examples include the use of discussion board responses (e.g., students add a question, students respond to a question, or teaching staff provide questions for students to respond) or include opportunities for peer reviews.

c) **If equations are required in solutions, students should be able to upload responses.** It is difficult and time consuming for students to enter equations or derivations using a web-form entry. File uploads should be enabled for online submission of assignments when solutions require equations.

d) **An Honor Code statement should be included on exams as well as any late assignments.** The honor code applies in all learning environments: face-to-face, hybrid, and remote learning. By including an honor code statement on late assignments, solutions can be made available sooner to students that meet the original deadlines. Including the honor code on exams is important especially with unproctored exams.
   - Suggested wording from the Honor Code: "I have neither given nor received unauthorized aid on this examination, nor have I concealed any violations of the Honor Code."

7) **Lecture Best Practices. (Additional links and resources are provided below.)**
   a) **Provide slides that permit additional annotation.** Annotating slides during your lecture provides a way to keep students engaged while watching asynchronously. Annotations may include working out example problems, using arrows/underlines to emphasize content, or completing missing information on the slide.

   b) **In synchronous sessions, try to watch the chat box for questions.** Some students are not comfortable voicing their questions and prefer to write their questions. Students may direct the question to everyone, or make it only available to teaching staff. Try to follow the chat box and respond to these questions. If a question is sent to you privately, read the question aloud for others before answering, but do not state who asked the question. Consider following up on chat box questions after the synchronous session, if necessary. Also consider using a fraction of GSI/IA time to monitor the chat box, as it can be difficult to follow the chat box while also delivering content.

   c) **In synchronous sessions, make sure everyone's voice is heard that wants to be heard.** Some students are comfortable making their voices heard, while others are not. Make sure to take moments during office hours, team meetings, discussion questions to ask if there are additional comments or questions from those students that have not spoken.

d) There are several ways to interact with students and the table below provides guidance on methods for content delivery and student interaction.

Table 2. Summary of interaction modes for a course. Table adapted from Dr. Dave Chesney, EECS Department

Mode of Interaction	Synchronous/ Asynchronous	Example Assessments	Notes	Technique
Deliver lecture material	Asynchronous	Weekly quizzes, discussion board questions (possibly for credit)	Establish a clear schedule of when quizzes should be completed	Record lectures in Canvas using Kaltura Record lectures in Zoom (Zoom Training Info) Explain Everything Lecture recording within a campus studio or classroom
Discussions, live Q&A	Synchronous	N/A, cannot require attendance	Schedule at a consistent time each week Post Q&A on Canvas Can use breakout rooms to have small group discussions	Zoom (Zoom Training Info) Google Jamboard for white boards that are stored (available in your Google apps) Miro
Students ask questions at leisure	Asynchronous	N/A	Respond within 24 hrs during the weekdays	Canvas discussion boards Piazza (CAEN Piazza page)
Students present to the class	Asynchronous	Rubrics from teaching staff, peer review from others in class	Recorded for other students to view	Submit a video assignment
Students work in groups w/o teaching supervision	Synchronous (for students)	Team reports, initial team contracts	Students schedule at consistent time per a team contract	Zoom meeting Group Files Creating groups in Canvas
Students work in groups w/ teaching supervision	Synchronous	N/A		Zoom meeting Group Files Creating groups in Canvas
Office hours	Synchronous	N/A	Be aware of student timezones	Zoom

Recommendations for Students

8) **General**

   a) **Different courses have flexibility in defining what collaboration is permitted, make sure you are aware of what is permissible for each of your courses.** Information on collaboration should be found in the syllabus. If you are not sure what the collaboration policy is for a class, reach out to the teaching staff.

   b) **If you have questions that arise when working on an assignment or watching asynchronous lectures, post or send your question in advance of office hours.** Providing questions in advance of office hours can support the teaching staff to have additional time to prepare a response to your question. Follow your teaching staff's preference for submission of questions as detailed on the syllabus.

   c) **Students should have the flexibility to select whether they want their videos on or off.** You may not feel comfortable showing your video, or may not have connectivity that permits video streaming. If video streaming is not selected, you are encouraged to have a current photo that is shown in the absence of the video.

9) **Technology**

   a) **If your available technology does not support effective remote interactions, reach out to April Hayes (aprilmra@umich.edu) in the College's Office of Student Affairs to obtain information about additional support.** To support student learning, it is important that students have access to the relevant computing technology, software availability, and internet connectivity. If there are troubles with any of these items, there are pathways for support that can be performed in a discreet manner for the student.
      - Does your internet connection enable you to access zoom office hours?
      - Does your internet connection permit you to download large files?
      - Do you have cell service? (Can be used to supplement connectivity issues, if available.)
      - Do you have access to a laptop or tablet computer?

   b) **When uploading handwritten assignments, it is recommended to use the following technique:**
      i) **iPhone - use Notes app to scan/create pdf**
      ii) **Android - use Adobe Scan**

c) **If you have issues accessing CAEN software or your umich email when remote, there are pathways to help.** You can forward your email to a different account within MCommunity or access it when using a VPN client. Additional information is provided:
  - Instructions to [forward your email](#) from ITS
  - [Setting up a VPN](#)
  - [Remote connection to CAEN software](#) using [VMware Horizon](#)

d) **If you are interfacing with Canvas, it is recommended to use Google Chrome.** Feedback from teaching staff and students found that other browsers can have problems with Canvas quizzes. Using Chrome may minimize compatibility issues.

10) Time management
  a) **Students should watch asynchronous lectures during the week the material was assigned.** It is important to watch lectures as they are made available. Make time during your week for watching asynchronous lectures. Do not wait to watch material until there is a homework assignment due or quiz approaching.

  b) **Students should use resources available to support time management.** It can be difficult to manage time during hybrid and remote learning as students have gained skills in face-to-face environments. Here are resources to learn more about time management:
  - [Support from CAPS](#)
  - [UIC Planning tools](#)
  - [Purdue time management tips](#)
  - [LSU Center for Academic Success tips and tools](#)

Additional Resources

In this section, you will find additional links and information to support developing hybrid and remote courses.

Topic	Notes
UM ITS Teaching and Student Engagement Guide	Resources and links for remote lectures, communication with students, and online assessments.
College of Engineering Minimum Quality Standards for Remote Teaching	The recommendations and norms presented above align with the best practices. Additional guidelines to support your teaching are provided in this document.
CoE Recommended Software Tools	Recommended software tools provided by the College of Engineering
Engineering Teaching and Learning Symposium Additional upcoming workshops	Videos provided with additional information, including leveraging available tools, building online community, and lab courses.
MiVideo	MiVideo provides videos that give more information on teaching online, including how to use zoom, Kaltura, and Canvas. Videos are also provided on screencasting with an iPad, developing video quizzes, and adding closed captioning.
Duderstadt Center Resources on Audio/Video Production	Additional information provided on making videos, as well as an email address to request consultations.
Perusall	Enables collaborative peer annotation and can be used for asynchronous collaboration.

Hardware

To support the development of asynchronous lecture material and synchronous remote interactions, the task force recommends that all teaching members (inclusive of faculty, instructors, lecturers, GSIs) be provided with a tablet device and high-quality webcam. Some may also be interested in having a backdrop to provide a simple background without needing to use virtual backgrounds. For those interested, IOE virtual backgrounds will be made available.

The following hardware is recommended:
* Tablet device - Apple iPad, Microsoft Surface, 2-in-1 laptop
* High-quality webcam - Logitech 920s or Logitech 930e

If you have not already followed up with <INSERT IT CONTACT> about receiving hardware support, connect directly with them.