Fall 2020 Physics subjects, descriptions of structures

8.01 (Peter Dourmashkin, Joe Formaggio and other faculty)
We are planning for 8.01 in the fall to have both synchronous and asynchronous content, in much the same way as was done for 8.02 in the spring term. Students will sign up with the registrar for one of 16 sections (distributed through the MTWRF schedules).

The synchronous content will consist of 2 1-hour long recitation-style classes led by faculty and a 1-hour "Friday problem solving" class led by TAs. These recitation-style classes (MW or TR) will have a short synopsis of the material for the week, and then consist of small group discussions and problem solving for the rest of the class. Because of the nature of these classes, we will not be recording them.

The asynchronous portion will be a series of MITx modules (4 per week) which the student must watch and answer shirt graded questions online as part of the class. This material will be the bulk of the physics content for 8.01.

Given the large number of sections available and that the bulk of the material is available online, we believe this will allow all students to participate fully even if remote and in distant time zones. We will make sure to have some alternatives available if internet connectivity becomes an issue.

We have also de-weighted the final for the course, put in a number of (lower weight) quizzes to assess student progress, and increased the weight of other assignments, including participation. So, we will not make use of a mid-term, though we still plan on using a final at the end of the term.

We will plan to use canvas as a gradebook and to help students keep track of due dates. MITx will be used to provide all the asynchronous modules, the in-class group work problems, the problem sets, and the online textbook.

8.012: (Phil Harris)
Lectures will be given at the same time as the normal classes and will be interactive. However, some of the material will be pre-recorded. The full lecture will be recorded and posted after the lecture appears.

This class will be taught synchronously. However, attendance is not mandatory and lectures will be available online. Recitations sessions are available in afternoon and morning and should be accessible to a broad range of time zones. Lecture notes will be made available slightly before the lecture.

For student assessment, we will modify the project to occur earlier and will be splitting the 2 Midterms and final into 5 midterms and a final exam.
We are working on developing interactive computer simulations. This is a bit of an experiment. The class syllabus is available at https://www.dropbox.com/s/d1snd1xc0zwh1al/8.012%202020%20Syllabus.pdf?dl=0 and contains information on changes in grading/timelines/schedules.

8.01L: (Pablo Jarillo-Herrero)
I plan to teach 8.01L asynchronously. The official schedule is MWF 9-10am. But because that is too early a schedule for Pacific-Mountain-Central time students, I have decided to give recorded zoom lectures MWF 2-3pm. Students are welcome to connect, but not obliged to do so. The 2pm schedule should work for all students that want to join. The lectures will be recorded in zoom and available to students right after. Lecture notes will not be made available. Students will be able to watch recorded lectures.

We are making changes in assessment of performance, decreasing the value of the final exam, introducing weekly assessment exercises, and increasing the value of recitation participation. The tentative grading scheme is:

- Recitation Participation: 15%
- MITx homework: 15%
- Written homework: 5%
- Pre-class questions: 15%
- Weekly assessments: 30% (about 15 of them)
- IAP Project: 5%
- Final exam: 15%

There will be weekly 30-minute assessments on Fridays from 2:30-3pm, remotely. On Fridays the lecture will be only 30 min, 2-2:30pm, followed by the weekly assessment. We will have no quizzes or mid-terms, as the weekly assessments will allow us to frequently evaluate how the students are doing.

8.02: (Nuh Gedik)
We plan to post pre-recorded videos for lectures, but run the lectures more like a recitation section. Also, the class will be offered in three one-hour sessions weekly, and there will be four sections students can choose from.

Pre-recorded videos for lectures will be posted online. For live lectures, which will be run as discussion sections, there will be lots of breakout sections, so it may be difficult to record.

Pre-recorded classes will be posted online so that students can view them at a convenient time. We also have 4 sections as opposed to the usual 2 sections, so there is more freedom to choose the time. We plan to have attendance in virtual discussion sections.
There will be written resources as well as videos that will be posted. For assessment, we will rely on five online quizzes, and the percentage of exams in determining the final grade will be less than usual.

**8.021: (Joe Checkelsky)**
Lectures and Recitations will be synchronous, and will not be recorded. Weekly quizzes will be flexible. Lecture notes will be made available after each class.

For assessment, the course will follow the model of weekly quizzes, homework, and participation together having more assessment weight than the final exam.

**8.022: (Daniel Harlow)**
I will deliver synchronous lectures over zoom at the scheduled course time. The lectures will be recorded, and I will also make the pdf lecture notes available to students in advance. My hope is that between the afternoon class time, the lectures being recorded, and the high-quality lecture notes, time zone problems should not be too serious. We will experiment with the recitations, but so far the plan to start with is to also do them synchronously.

My current inclination is to make the problem sets a bit shorter, to make the midterms and final open book and not proctored (if Institute rules allow this), and to make the exams be worth less of the grade.

**8.03: (Long Ju)**
This class will use a blended, flipped classroom structure, using existing lecture videos on OCW.

Our plan is to record recitations and office hours, (only the main screen, not showing students' faces.)

Because students will watch OVW videos for lectures, they will be able to see them at a time convenient for where they are located. Lecture notes will be made available before each lecture.

Assessment will be based on homework, two mid-terms, and one final.

**8.033: (Salvatore Vitale)**
Lectures and recitations will be recorded and made available immediately after. Classes will be taught synchronously, but students in different time zones can watch the recorded lectures (or live if they are in the Cambridge time-zone). I don't take attendance, so students will not be policed or penalized for not being in class.
We are considering having one recitation cycle in the morning and another in the afternoon if that works for the recitation instructors as well as students.

Lecture notes will be available after the official time of the lecture. Assessment will be based on Psets + 2 Midterms + 1 Final (same as previous years). We will be elastic with the weights that are assigned to each of these parts, to encourage continued participation and effort, but I have not yet determined specific numbers. I do not plan to heavily weight the PSETs (no more than 20% or so).

8.04: (Barton Zwiebach)
Lectures will be pre-recorded lectures made originally for MITx. Recitations will be taught on line and recorded.

8.05: (Phiala Shanahan)
Classes will be taught synchronously, with recordings of all lectures and recitations, and variable office hour times to accommodate students’ time zones. Lecture notes will be available after each lecture.

Assessment will be flexible in the weightings of different assessment components, to be finalized on the syllabus.

8.07: (Martin Zwierlein)
I plan on lecturing directly, through Zoom, and try to create an environment that is as close as it can be to the classroom setting. I will ask, unless there are objections, for students to show their video, so that we all have a better feeling of learning in a community. It will make the lectures more lively. I’ll record the Zoom lectures and make them available off-line.

I want to teach at a particular time “synchronously” (the specific lecture time may be changed to an earlier time from the current posted time of 1:00 pm EDT), but I wouldn’t take attendance or require students to attend; I would just strongly suggest they should attend for their own benefit, so that they can ask questions. It’s the interactive part of a lecture that makes it more valuable than a recorded lecture. If students cannot attend at the time we settle on, they can look at the recorded lectures online.

The lecture notes will be made available after the lecture. I plan on using a combination of powerpoint and direct writing on my ipad, which will be made available after class.

We plan on having a regular assessment structure, with two quizzes and a final exam. However, for the quizzes, due to the possible time difference and circumstances, I will likely give more time than the usual lecture time.
There is a possibility that there will be new YouTube videos for problem solving, to be created by recitation instructor Yen-Jie Lee.

**8.09/8.309 (Iain Stewart)**
I will provide synchronous lectures at the lecture time. My hope is that students will attend. Since some will not be able to the lectures will be recorded and available to all students afterward.

I have a latex version of my lecture notes that will be provided ahead of time. After and during the lectures I will provide a handwritten version of what is actually covered in each lecture to go along with that day's video.

I will be modifying the assessment structure, but have not made final decisions about this yet. Basically the structure will weigh things differently for 8.309 (grad students) and 8.09 (undergrads), while still having the same basic elements (problem sets, midterm(s), final). Essentially the undergrads will have a much higher portion of the grade given to problem sets by default (e.g. 50%), whereas for grad students, for whom this can count for their qualifying exam, the percentages will weigh exams more heavily (perhaps 60% exams, 40% problem sets).

I have not decided yet on whether to hold 2 midterms + 1 final, or just retain the 1 midterm, 1 final setup. There are pluses and minuses to both of these. I will get back to you on scheduling the midterm once I know.

In intend to have one section / problem solving session scheduled for Fridays, taught by the course TA.

**8.10: (Frank Wilczek)**
I will be having sessions once a week. My tentative plan is to use Zoom, but I am open to alternatives. Sessions will be interactive. The idea will be to focus on one or two topics, give some advance readings, give a 20-30 minute talk, go around to the registered students and ask them to comment. I will ask them to write 500-word essays on each topic, and will comment on their written submissions.

Lectures are likely to be recorded. Classes will be taught synchronously, since I want the sessions to be interactive.

I will be distributing material, which will rarely be notes, but rather links to articles.

**8.13/8.14: (Gunther Roland and faculty)**
Junior Lab has had a blended structure for a number of years, with MITx based lectures and in-class discussions. In-class discussions will be moved to Zoom. We are currently
not planning to record the in-class discussions. In-class announcements will be repeated on Canvas and Slack.

We are hoping that the combination of 9-noon and 2-5 sections will allow all students to find a time that works. Individual discussions between instructors and the student teams will be scheduled to accommodate student schedules.

Information including lecture notes will be posted on the course websites, and any additional notes will be posted on Canvas/Slack.

Aside from Institute changes in grading policy, we will keep the assessment structure mostly unchanged, although we make small changes to the number of assignments (downward).

We will be using a different selection of lab experiments from previous classes, with remote operated experiments, take-home kits and open data analysis projects. Most of the scheduled class time will be used for individual meetings between instructors, TAs and the 2-student teams (~1h/week/team).

8.224: (Erin Kara)
Lectures will not be pre-recorded. Classes will be taught synchronously, and will be recorded at the request of students in different time zones. The students will be graded on in-class participation. For students who cannot attend at the scheduled time, we will make accommodations. Lecture notes will be made available before the official time of the lectures, so that students can follow along. There will be no written final, but there will be a final project.

8.225 (David Kaiser)
The course will be taught entirely remotely. Lectures will be recorded and made available to all members of the class.

Lectures will be held synchronously (M/W 1 - 2:30pm), but I intend to upload lecture notes and/or lecture slides in advance of each class session, and post a video of each class session right after a given class, to accommodate asynchronous learning. The TAs and I will also work with students during online office hours and will work hard to accommodate people in various time zones.

In previous years, in-class participation had contributed 10% of the overall course grade, with the other 90% coming from grades on various writing assignments. This year I expect that I will adjust the weighting of each paper assignment so that written work constitutes 100% (rather than 90%) of the final course grade. As in previous years, there will be no midterm or final exam for this class.
8.231: (Xiao-Gang Wen)
All lectures will be recorded. Lectures will be delivered synchronously but students can watch them at a later time. Lecture notes will be made available before each class. Assessment includes homework once a week; there are no quizzes nor is there a final. The grade is based on homework and a term paper.

8.286: (Alan Guth)
There is a complete set of lectures for 8.286 on OCW from 2013. But I also think that live lectures can be more exciting than prerecorded lectures. So I plan to use a mix of live lectures and flipped classrooms based on the 2013 videos. I will adjust the mix based on what seems to work best.

All lectures and discussion classes will be recorded. Office hours will not be recorded, to provide a low-anxiety atmosphere in which students can ask questions.

The classes will be synchronous, because I think that provides the best contact between me and the students. The classes will be recorded for students unable to attend at the designated time. Bruno (the course TA) and I will try to arrange special meetings as necessary to keep students in far-away time zones engaged. I will make it a point to have the lecture notes available before the lectures.

The assessments will be done pretty much as in recent years. There will be no final exam. There will be three 80-minute quizzes during the term, each of which will count for 25% of the final grade. The problem sets will count for the remaining 25% of the grade.

8.321: (Washington Taylor)
The course will have essentially the standard structure, with lectures primarily synchronously at the standard posted time. I will try to record the zoom lectures for students who cannot make the primary lecture but will encourage students to be present for the main synchronous lecture so they can engage with questions etc. I will make my lecture notes available to students, most likely after the official time of the lecture. The class will be graded primarily on problem sets. I think there will also be some kind of final exam but I have not yet worked out the format. We will see how the fall begins, if this goes smoothly hopefully I will continue as just described throughout the semester, but may change the set up as the situation warrants.
8.324: (Tracy Slatyer)
I am planning to maintain a standard lecture + recitation structure, as online lectures worked well (my class reported high satisfaction) for me in a similar graduate class in the spring.

I will give synchronous lectures -- which will be recorded -- but will not require attendance. I will make all lecture notes and recorded lectures promptly available, which should allow students in other time zones to watch the lectures on their own time. I will set up a Piazza page (or similar) to allow students to ask any questions they may have outside lecture hours, and encourage students to post questions as they watch the lectures.

I plan to provide lecture notes prior to class, and also separately (during/after the lecture) the real-time notes I wrote during lecture.

Assessment is 100% based on problem sets to be completed outside lecture, with no synchronous assessment component. I allow students to drop the lowest problem set with no questions asked, to accommodate the likelihood of a "bad week" during the semester, and will excuse problem sets as necessary to account for emergencies.

8.333: (Senthil Todadri)
Lectures will be recorded. Classes will be taught synchronously (all students asked to attend lecture at posted time)? I will urge students who are able to attend the lecture during the allotted time. However, if time zone or other factors affect ability to attend, I will record all lectures/recitations. Lecture notes will be available after each lecture. The tentative plan for assessment (which may be tweaked a little before classes begin) is:

- Homework 70%
- Three quizzes 20%
- Final 10%

8.370J: (Peter Shor)
The lectures will be offered synchronously, but they will be recorded for students who cannot make the scheduled time.

Some of the lecture notes may be made available to students after the lectures if time allows; they will not be available before.

The assessment structure will be homework and tests, as before. (Please note I am Considering increasing the homework component.)
8.372: (Aram Harrow)
Class will be synchronous. Attendance is recommended but not required. For those unable to attend, videos will be available afterwards. I'll also provide some notes in advance of lecture. Assessments will be psets and a project, consisting of a paper and a talk.

8.511: (Leonid Levitov)
We'll have live lectures (in zoom) with recording made available shortly after lecture through course website. 8.511 will be taught synchronously; students in other time zones can either join during normal lecture times or watch recording. The times 8.511 will meet are 1-2:30 pm, which make the synchronous mode convenient for students in all time zones in US and Europe.

Lecture notes will be available both before and after lecture. We'll use zoom voting system for feedback during lectures. The final exam will take place and we will follow Institute rules on that.

We'll be using Slack to enhance social interactions and for discussing class topics and homework. Friday recitations 1-2:30 will be used as a discussion forum and a homework club.

Friday recitations will be live (via zoom) but also recorded and available afterwards. We'll try to make the best use of Slack to compensate for the lack of social interactions in the classroom. In addition, TA Ali Fahimniya will hold office hours on zoom on a weekly schedule and on an individual request basis as well.

8.591: (Jeff Gore)
The class will be taught synchronously. Lectures will be recorded so it will be possible to watch later although the students would then not benefit from the interactions that will take place during class time.

I will write on lecture notes during class and then post after the lecture.

We will take advantage of the breakout rooms feature of zoom so that students can work together and discuss in small groups.

8.613J: (Nuno Loureiro)
I'll teach all lectures live via zoom, record them, and then make the zoom recording available to the students on the canvas website. This course follows a textbook pretty closely. The students will know ahead of time what material from that book will be covered in the following lecture.
For assessment there will be 4 problem sets, a midterm exam, and a final. The only difference with respect to a normal year is that both the midterm exam and the final will be take-home exams; the students will be given a few days (~ one week) to do them and submit their answers.

8.701. (Markus Klute)
Class will be taught in an inverted classroom online setting. To do this, I'll record video lectures and provide lecture notes (and sections in textbooks). Students will be asked to prepare with the material for recitations and discussions. The standard lecture times Tuesday and Thursday at 1.30 - 3pm will be used for these recitations and discussions and cut to one hour (2-3pm). The evaluation will be based on psets, a presentation, and a take-home exam. I'll post this information on canvas in the next days.

8.811: (Lindley Winslow)
I will keep the discussion nature of the course, which is taught as a hybrid lecture/seminar/discussion depending on the topic. Lectures will be recorded, and will be delivered synchronously; among currently registered students, no one is in a significantly different time zone.

I am not at this time planning on posting lecture notes, since the lecture portion of the class follows the official text book closely. Other materials will be provided or referenced. The course does not have exams and is focused on assessments that more closely match research. The final project is a presentation and there are several writing assignments and long problem sets.

8.871: (Hong Liu)
The structure of the class will be the same as before other than it will taught on Zoom. If students in the class do not mind, we will record the lectures.

The class will be taught synchronously. For students who cannot make the lectures due to time zones, they can use recorded lectures. I will also arrange separate sessions for them to discuss possible questions they may have.

Lecture notes will be made available generally after the lecture. Performance will be assessed based on psets. There will be no exams.

8.902: (Mark Vogelsberger)
All teaching will be fully online, and lectures will be recorded. Most classes will be taught synchronously (as well as recorded). We will provide special office hours for
students in different time zones. Lecture notes will be made available after the official lecture time.

Due to time constraints, we will have to move the class to a time slot after 4pm EDT. It is also possible that we may combine the two lectures into one lecture and move it to a day that works for all students. We will communicate about this with the students.

There will be no midterm; instead, we will have one additional pset.

8.942 (Kiyoshi Masui)
(Cosmology) will be taught in a flipped format, with the main material taught through recorded lectures and supplemented with assigned readings. During synchronous time (twice per week) we will collaboratively work on concepts, problem sets, and programming projects. An effort will be made to schedule these such that all registered students will be able to attend at least one of the two sessions at a reasonable time in their time zone. Evaluation with be principally through problem sets, collaborative programming projects (for numerics and data analysis), and an independent student project and presentation. There will be no exams.