Overview of Creating an Online Course



7/3/13 V. 1.0

Table of Contents

Introduction and General Tips	3
A Brief Journey through an edX Course	5
8 Steps to Creating an edX Course	7
Step 1: Assemble the "About" Page Components	8
Step 2: Create the Course Preliminaries	10
Step 3: Create Learning Sequence	16
Videos	20
Step 4: Create Learning Exercises	23
Step 5: Create Homework Assignments	27
Step 6: Include Online Textbooks	28
Step 7: Being Social and Discussion Forum Guidelines	29
Step 8: Certificates of Mastery	32

7/3/13 V. 1.0

Introduction and General Tips

Welcome to designing a course on edX!

This guide describes how you might create an online course for edX. Although the descriptions and examples use the edX platform, the general principles and practices described should be applicable to online courses on any platform. The guide first discusses a learner's experience in taking a course on edX, and then discusses how you can create your own course using Studio, the edX course authoring tool.

A few general tips before you start:

- Although edX Studio makes it easier to author a course, creating an online class is still a lot of work. We encourage you to allocate enough time and resources to be able to do a good job.
- O Before you start, we urge you to assemble a team of teaching assistants, teaching fellows, or undergraduate volunteers to help with creating the course, particularly in creating the exercises and homework assignments, helping with solutions and discussion forums, and with debugging and testing the course. Depending on your needs, you may also plan to collaborate with software developers, video/media experts, instructional designers, or other specialists.
- Campus classes are often 8 to 14 weeks long. Although you can teach your campus class as a single edX course, you might also think about breaking up the course into two or three modules if logical boundaries exist.
- One of the big differences between an online course and a campus class is that the online class is built up of many bite-sized components, such as 3to 7-minute video snippets or individual exercises. When thinking about creating content, try to make each component as modular (standalone) as possible. Modularity has many benefits. Modularity will make it easier to reorganize your course as necessary. It will also make it easy for learners to find compactly organized reference information about a specific topic. It will also enable you to interleave modules together conveniently, for example, video modules interleaved with exercises. Modularity will also allow you to easily replace or improve any given module while minimizing the impact on adjacent material. For example, the authors of edX101 (a course about creating a course) plan to redo some of the video snippets to have less text and more handwriting and hand-drawing when time permits. Learners with busy lives can complete a module whenever they have a small amount of available time. Finally, modularity will facilitate sharing of content.
- Although many of the fundamental educational principles apply equally to both online and in-person learning, there are many differences. One of

the key differences that you will notice in edX courses is that the traditional classroom lecture is replaced with a *learning sequence*. Borrowing from the Socratic method, a learning sequence is a set of video snippets interleaved with finger exercises. Learning sequences promote active engagement as the student checks their understanding of the material by solving a simple exercise related to one or more videos that they have just watched.

Try to make your course be of the same rigor as your on-campus class. A rich palettte of problem types is available to you as a course author. In addition, edX is committed to its learning platform as an open source project. If your course requires some special components or software, like an online lab and we encourage you to participate in this community of developers.

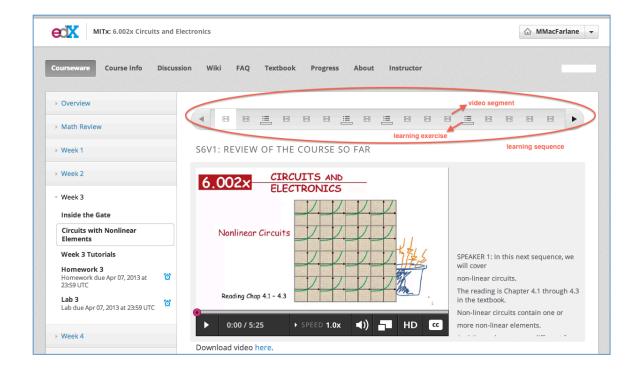
Examples of relevant documents referenced throughout this text can be found conveniently in the Appendix section of this guide.

Best of luck as you proceed!

A Brief Journey Through an edX Course

This section describes briefly a learner's experience in an edX course. You are also encouraged to review an edX course to familiarize yourself with the various components and structures. You are welcome to skip this section without loss of continuity if you are familiar with the components of an edX course.

Below is a screen shot from a course on edX, 6.002x Circuits and Electronics. The components of an edX course are reflected in the tabs on top of the page that can include Courseware, Course Info, Discussion, Wiki, Textbook, Progress, and other customized tabs.



Learners spend a significant portion of their time in Courseware illustrated in the screen shot above. This edX course is organized by week with the material for each week accessible through the links on the left hand side of the page. During a typical week, an edX learner might engage with a couple of learning sequences, a set of tutorials, a homework, and a lab. Many courses will not have tutorials or a lab.

The screen shot shows a learning sequence titled "Circuits with Nonlinear Elements". As described earlier, a learning sequence is a set of video snippets interleaved with relatively simple exercises. Learning sequences promote active learning: the student checks their understanding of the material when they attempt to solve a simple exercise related to one or more videos that they have just watched.

Computer based auto-grading provides the learner instant feedback as they solve the exercises. Instant feedback allows the learner to go back and review the video or the textbook and retry an exercise till they get it right.

The figure also displays, in the middle of the page, a video snippet in the learning sequence. A downloadable version of the video is available at the bottom of the page, and a transcription of the video is provided on the right hand side. A link to the relevant portion of the online textbook and links to the lecture slides are also provided. Additionally, learners can discuss the material with others in the local discussion forum provided conveniently below the video and associated links. This local discussion will also appear in the global discussion forum to be discussed shortly.

Homework may contain a set of auto-graded problems and are generally more challenging than the finger exercises. Optional tutorials might contain videos, text or other material. Labs might include a virtual simulation-based experience for the learner.

The Course Info page accessed via the Course Info tab conveniently contains course announcements, course administration information, and any other handouts that the instructor may want to issue to the learners.

The Textbook tab leads to an online book, and the Discussion tab leads to the course discussion forum. The Discussion Forum brings a key social element to a course. Learners can ask questions or discuss various topics on this forum. More details on best practices for the instructor for the forum and the textbook are described in later sections of this guide. The Wiki tab leads to a collaboration area for the site where learners create and edit shared content.

Finally, the Progress tab leads to a dashboard that provides an indication of the learner's current progress through the course and includes their grade and status for each of the course assessments.

You are encouraged to include a *self-assessment* or *self-diagnostic* quiz in week 1 of your course so that learners can self-assess whether they have the appropriate prerequisites or preparation. Note that we do not encourage entrance tests, so the self-assessment quiz is solely for the learner's benefit. If they get certain problems wrong, you might suggest various background readings that might help them better prepare for the course. You might also consider including a set of self-assessment questions in your course About page so that learners can be better prepared when they start your class.

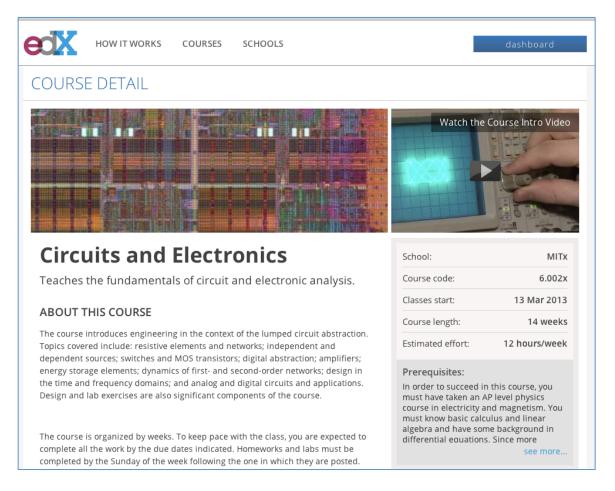
Eight Steps to Creating an edX Course

The process of creating an edX course can be conveniently broken up into 8 steps briefly summarized here. The remainder of this guide will go through these steps in detail.

- 1. Assemble the material for the "About" page. The About page is the advertisement for the course and provides a birds-eye view to a prospective learner who may be considering whether they want to take the course.
- 2. Create the preliminaries. For example, include a syllabus, welcome announcement for landing page, and welcome email. This information is largely contained in the Course Info page, which is the first page that a learner sees when they enter a course.
- 3. Create video snippets as part of learning sequences. Video snippets are generally 3 to 7 minutes long and can be captured in several ways including handwriting, PowerPoint capture on a tablet, or live classroom capture.
- 4. Create learning exercises as part of learning sequences. These are finger exercises are meant to enable learners to check their understanding of the material they have just watched in the videos.
- 5. Create homework assignments. Homework assignments contain problems that engage the learner at a deeper level than with the learning exercises.
- 6. Include textbooks. Videos and exercises throughout the course can be linked to relevant portions of the text, enhancing the resources available to learners.
- 7. Support the Discussion Forum. The Discussion Forum is a key social component of the course. Moderation of the forum is an important activity for the instructor and teaching assistants (TAs).
- 8. Document the information for the certificates of mastery. Learners who pass the course receive a certificate of mastery from edX and the university that offers the course.

Step 1: Assemble the "About" Page Components

An "About This Course" page is an advertisement for your course, composed of materials you provide. EdX publishes the page on the edX.org website several months before the course begins so that learners can understand what the course is about, when it is offered, and the level of effort required so they can decide whether to register. Below is a sample of an About page on edx.org.



The materials you provide for your About page include:

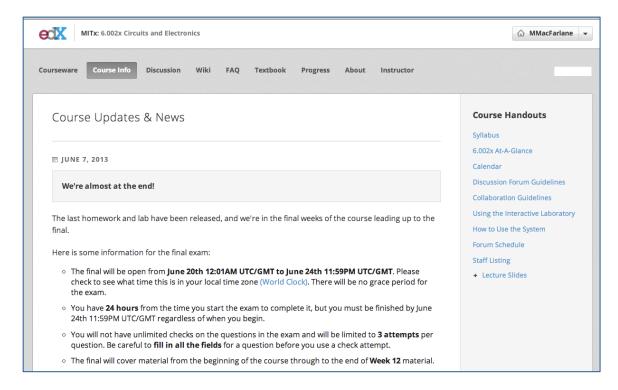
- A descriptive image that captures the essence of the course.
- A teaser video for the course. This video should include compelling visuals from the course and discuss why this subject is important, what the learner will be able to do after taking the course, and who the instructors are. The video will come to life if you also include something interesting and personal about the instructor (for example, the MITx 6.002x circuits and electronics course shows that Prof. Gerry Sussman loves to fix watches). The video can also include some background visuals from your university to give the learner some context as to where the course is coming from.

- A course description, or Overview, that briefly discusses what the course is about, the topics the course contains, and any general organizational ideas about the course. Also include a brief course description (146 characters) that can accompany the title.
- O Prerequisites for the course. Try to state the prerequisites in a general way so that learners around the world are able to interpret the requirements without necessarily knowing the local lingo. For example, instead of saying "BC Calculus", you might say "an advanced high school course on calculus, such as BC calculus in the US".
- o Instructor and staff biographies, titles, and photographs.
- FAQs, or frequently asked questions and the respective answers. Common questions to answer include: What is the textbook for the course? Is it required or recommended? Is there a fee for the course? Is there a fee for the certificates or are they free? Is there a proctored test for the course? Are there any special pieces of software needed? Are there any special system requirements? What are the principles by which assignment due dates are established? And anything else that you can think of which will be helpful to the learners.
- Some of the important details about the course are collected in a table in the upper right hand corner These include the start and end dates for the course, whether the course has any prerequisites, and the estimated weekly effort.

(If your course is hosted on edge.edx.org, you can construct the About page yourself in edX Studio. The layout is different, but the components remain the same.)

Step 2: Create the Course Preliminaries

Much like in an on-campus course, the course preliminaries for edX are the scaffolding of the course. These are a set of introductory materials that a learner will view when they first enter a course and are not unlike the administrative material you might handout on the first day of a campus class. As shown in the illustration below, these items are mostly collected under the Course Info tab in edX.



Course preliminaries can include:

- A syllabus
- A course schedule
- Any specific collaboration or discussion forum guidelines
- A welcome announcement on the landing page, and future announcements
- o A welcome email and future email communications

Let us discuss each of these in turn.

Syllabus

Wikipedia describes a *syllabus* as an outline and summary of topics to be covered in an education of training course. A sample syllabus is illustrated below. As with an on-campus course, a syllabus may include:

- Topics covered by the course
- Names of instructors and Teaching Assistants for the course
- A grading rubric
- Textbook information
- Various items of work that the learners can expect
- Deadlines and important dates
- Exams and topic coverage for exams
- o Any special instructions e.g., special Discussion Forum sessions

MITx 6.002x - Circuits and Electronics General Information

March 13th, 2013

6.002x is a fundamental undergraduate electrical engineering course that introduces engineering in the context of the lumped circuit abstraction. Topics covered include: resistive elements and networks; independent and dependent sources; switches and MOS transistors; digital abstraction; amplifiers; energy storage elements; dynamics of first- and second-order networks; design in the time and frequency domains; and analog and digital circuits and applications. Design and lab exercises are also significant components of the course.

Materials taught in 6.002x are equivalent to those taught in 6.002. At MIT, 6.002 is in the core of department subjects required for all undergraduates in Electrical Engineering and Computer Science.

Prerequisites

In order to succeed in this course, students must have taken an Advanced Placement (AP) level physics course in electricity and magnetism. Students must know basic calculus and linear algebra, and have some background in differential equations. At MIT, the equivalent course 6.002 requires 18.03 and one of 8.02 and 6.01. All three courses can be found on MIT OpenCourseWare.

Course Schedule

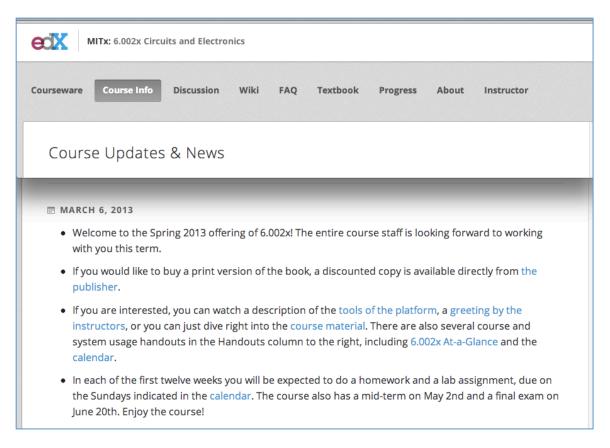
The course Schedule includes course topics and when they are covered during the course. The course schedule is useful for both your course planning and for the learner to get bird's eye view of the course. A course schedule has been also called a course-at-a-glance or a course calendar. An example course schedule is illustrated below. A course schedule may include:

- o Topics to be covered by week
- o Issue dates and completion deadlines for various assignments
- o Dates for special assignments such as exams
- o Readings from the textbook
- If desired, the course schedule can also include expected outcomes by week

	Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
March	1	11	12	13: Week1 videos, HW1 & Lab1 release	14	15	16	17
	2	18: Week2 videos, HW2 & Lab2 release	19	20	21	22	23	24: HW1 & Lab1 due
	3	25 : Week3 videos, HW3 & Lab3 release	26	27	28	29	30	31 : HW2 & Lab2 due
April	4	1: Week4 videos, HW4 & Lab4 release	2	3	4	5	6	7: HW3 & Lab3 due
	5	8: Week5 videos, HW5 & Lab5 release	9	10	11	12	13	14 : HW4 & Lab4 due
	6	15 : Week6 videos, HW6 & Lab6 release	16	17	18	19	20	21 : HW5 & Lab5 due
	7	22 : Week7 videos, HW7 & Lab7 release	23	24	25	26	27	28 : HW6 & Lab6 due
		29	30					

Welcome Announcement

The welcome announcement on the Course Info page is a welcoming landing pad for the learners and provides guidance and instructions about the first steps in starting the course. Below is an example welcome message from one of our courses, CS188x: Artificial Intelligence, from BerkeleyX by Dan Klein and Pieter Abbeel. We encourage you to post a regular stream of announcements throughout the course in this Course Info area. For example, you may provide words of encouragement, inquire about how things are going, suggest a discussion on the discussion forum, clarify common questions asked, announce impending deadlines or exams, provide topic coverage for exams as they approach, point learners to particularly interesting posts on the discussion forum, etc. You might also point to specific items like videos or exercises that you want the learners to be sure to look at.



Shown above, the welcome announcement encourages the learners to check out the syllabus page, points them to the course information page, informs them about the forum, and also tells them what is available for view. The instructors have also pointed to a self-diagnostic quiz and some material to help learners improve their preparedness for the course. Your own welcome announcement should cover similar topics as relevant.

Collaboration and Discussion Forum Guidelines

It is well worth including as handouts a set of collaboration guidelines and discussion forum guidelines as a reminder to the learners. You are also encouraged to place the information in the course About page that you created in Step 1 as one of the handouts in the Course Info area. At a minimum, this provides for continuity for the learner before and after registration for a course.

Offering learners guidelines on how to collaborate encourages them to help each other learn. Likewise, discussion guidelines can give your worldwide audience an idea of the types of conversations you would like to foster in the forums. Topics can include:

- Working together versus sharing answers
- o Acceptable versus unacceptable outside resources
- How and when to ask for help with a topic
- Different standards of collaboration for practice exercises, homework, and exams

Communications and Welcome Email

While your Course Info page serves as home base for disseminating information directly to your learners, we recommend that you also send crafted emails before and during the course. To ensure that your learners are engaged and responsive, we recommend that your email communications be brief and to the point. Personal emails such as these will increase the likelihood learners will complete your course. Usage may vary, but we recommend outreach to learners 2 months, 1 month, one week, and one day before your course begins.

Particularly important is the welcome email, such as the one shown below, sent to all the learners registered in your class just before your class begins. Many learners will have signed up to take the class months in advance, so this email serves as a useful reminder for them that the course is starting.

Hello!

Welcome to the first ever edX offering of PH207x, "Health in Numbers: Quantitative Methods in Clinical & Public Health Research." We are so happy to see each and every one of the 37,347 students from nearly every country on earth.

Class starts starts today. How do you get started?

- **Step 1:** Visit the course about page (https://www.edx.org/courses/HarvardX/PH207x/2012_Fall/about), log in at the top right, then click on "View Courseware"! There, you'll find all sorts of information, a syllabus, and instructions for how to start your first interactive lesson.
- **Step 2:** Introduce yourself to your new classmates on the discussion board!
- **Step 3:** Visit meetup.com (http://www.meetup.com/edx-community) and find other students in your city to study with.

General Guidelines for emails to learners:

We've listed below a few tips for crafting emails your learners will open, read and act upon:

- Write a meaningful subject line
 - Your learners should be able to quickly understand the exact purpose of the email from the subject line.
- Keep the message focused
 - Whether you are simply informing learners of key dates, or want them to respond to a class survey, keep the message of your email focused on one key point.
- Avoid attachments
 - Instead point learners to course information page or discussion forum.
- Identify yourself clearly
 - Many learners are registered for more than one course, so make sure your learners can quickly discern which course you are writing about and that the email is from the course instructor.
- Use simple English
 - Remember that many learners are not native English speakers, so plain, simple English is best.
- Be personal and personable
 - Use a conversational tone, as if you were in a room with your learners, chatting with them.
 - Contractions, short words, active rather than passive voice and short sentences are best.
- Keep questions to a minimum
 - As a general rule, include no more than one question per email.
 - More than that gets confusing.

Here's an example of an email to a class that works:

Subject: How has 14.73x changed your thinking?

Hi 14.73x

It's wrap-up week for our course, and we thought it'd be interesting to hear about your experience in 14.73x. This is the first time we've run this class, after all, and we'd like you to answer the question: What's the coolest thing you've learned in this course?

Just submit a 2-3 minute video or an email (less than 300 words please). Send your email to edx 101-stories.org with the subject line: 14.73.x [your edX username] by Friday April, 19 midnight EST.

Look forward to hearing from you, and happy learning!

Your 14.73x team

15

Step 3: Create A Learning Sequence with Videos and Learning Exercises

We are now ready to dive into creating the body of a course. Below is a screen shot from a course on edX. As discussed earlier, and repeated here for convenience, the components of an edX course are reflected in the tabs on top of the page that include Courseware, Course Info, Discussion, Wiki, Progress, and other custom tabs.

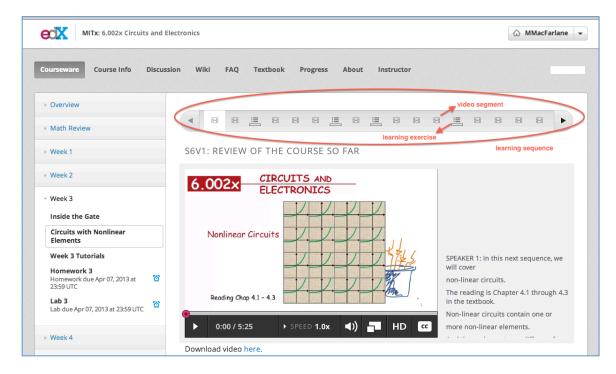


Figure 1 The courseware section.

A course is organized into sections. The illustrated courseware section above has chosen to name these sections "Weeks". As discussed previously, for each section learners study a couple of learning sequences, along with a homework and an optional tutorial and an optional virtual laboratory. All of these components of courseware can be assembled within edX Studio.

A learning sequence is a set of video snippets interleaved with relatively simple finger exercises. The exercises enable learners to apply the knowledge gained in the videos before proceeding to other material, thereby promoting active engagement by the learner. These exercises are meant to be quick and to enable learners to check their understanding of what was just covered. Instant feedback through autograding helps the learner gain confidence they have understood the material or

suggests that further review of the material is necessary. Learners can skip the finger exercises in learning sequences without penalty.

Learning sequences promote active learning. In the words of Benjamin Franklin:

Tell me and I forget.

Teach me and I remember.

Involve me and I learn.

More recent studies have also shown that active learning significantly improves learning outcomes.¹ Later in the following sections, we will look at how to create videos and exercises in more detail, but for now let's look into the bigger picture of creating the material for the Courseware page.

Learning sequences replace lectures in edX courses. A lecture is usually an hourlong exposition of some concept. For an online course, you will take each of your lectures and divide them into modular, bite-sized videos. Try to make each video about 2 minutes to 15 minutes in length and as modular or standalone as possible. Providing information to the learners in bite-sized modular chunks helps the learner. If the video snippets are longer than 10 or 15 minutes then you will risk losing the attention of the learner. Sometimes this is not possible, so try to find natural break points in the flow of your usual lecture where you can start and stop each of the video snippets.

A learning sequence might start with a video reviewing material covered in the previous learning sequence. You might also choose to end a learning sequence with a video summarizing what you have just covered. As will be discussed later, inject finger exercises after each major concept.

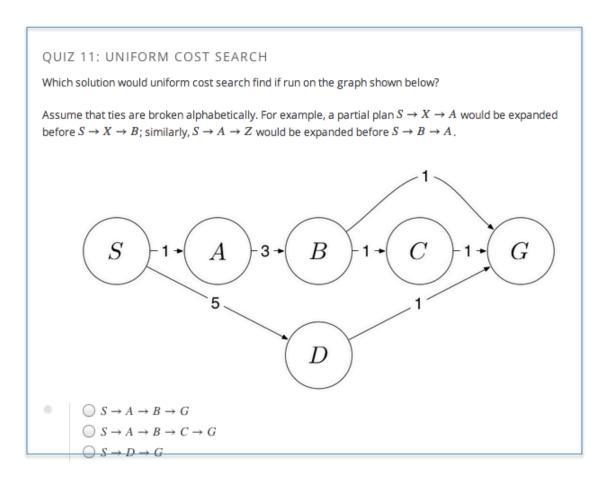
The figure above shows a video snippet within a learning sequence. A transcription of the video is provided on the right hand side. Once you have created a video, you can have it transcribed through a transcription service. We encourage making downloadable versions of your videos available for those learners with an intermittent internet connection.

The learner can control the pacing of the video by pausing it and speeding it up or slowing it down, or rewinding as many times as they need by using the navigation

¹ Learning and retention is related to depth of mental processing. Craik and Lockhart, 1972.

controls at the bottom of the video. Studies have demonstrated that self-pacing improves learning outcomes.²

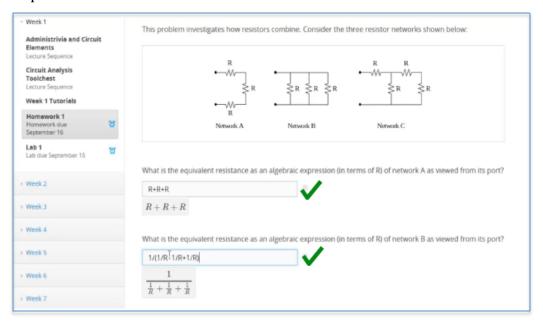
Exercises following one or more videos allow the learner to practice the material. Alternatively, for questions that are Socratic in nature, the learner can try to come up with a solution themselves before the instructor presents the answer. Although exercise types are covered in detail in a following section, we will briefly review them here. Below is an example exercise showing a multiple choice question.



The edX platform automatically grades exercises without requiring manual effort by a TA or instructor thereby providing instant feedback to the learner. The figure below shows an example exercise in which the learner has entered the correct responses. Correct responses on the edX platform are rewarded with the classic

² Mayer, in his 2003 study in the *Journal of Educational Computing Research*, for example, demonstrated that students who are able to press a continue button to go onto the next segment perform better than students who are not able to pace themselves.

green tick mark. Instant feedback has been shown to have a positive effect on learner performance.³



As illustrated in Figure 1, you might choose to embed other material below each video snippet or exercise. For example, you can elect to include a link to the relevant portion of the online textbook below the video in a learning sequence. Similarly, links to the lecture slides, including both original and annotated, can also be very helpful to the learner. Finally, you can instantiate a discussion topic by each video and exercise so that the learners can discuss the material with others who have also recently gone through this material. This local discussion topic, embedded in the learning sequence, will also appear in the course discussion forum to be discussed later.

³ Rapid feedback has a significant and positive effect on student performance when compared to no rapid feedback – Chen, Whittinghill, and Kadlowec 2010.

Creating Video Snippets

Teaching online is different from traditional lecture capture in some pretty profound ways. Instead of teaching to numerous people at the same time, online allows to teach in a way that is more similar to one to one communication. While many people will watch your videos online, they will be watching them one at time. Thus, the transition from the classroom to online instruction is similar to the change from stage to film.

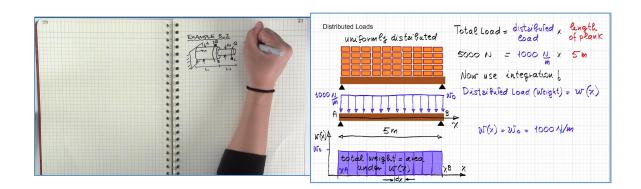
Another significant difference is allowed with organization. Instead of presenting constantly for a long period of time, the edX platform allows for short presentations (3-7 minutes) to be interleaved with exercises that reinforce the concepts covered. If you plan the instructional segments with knowledge of the exercises that go along with them, you can create a more fluid experience for learners and bolster instructional quality.

We suggest you try and make videos between 3 and 7 minutes long. If you go over this time, that's completely fine. Some subjects or topics are hard to cover in a short amount of time. However, we find that the challenge of shortening instruction for online can often be a great exercise in organizing lessons and getting directly to educational goals.

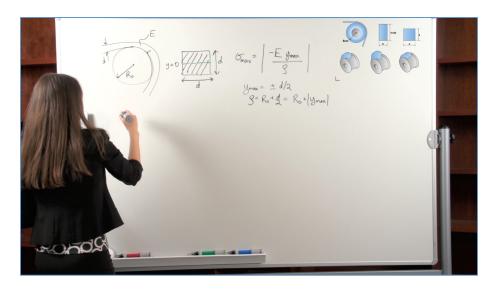
Modes of video capture

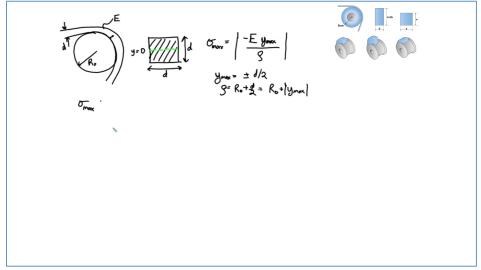
There are three basic modes of video capture.

• **Tablet capture**: In this method of capture, we capture just the instructable portion of the lecture. This can done on a tablet, using a whiteboard or chalkboard, or just graphics. Khan-style tablet-capture videos involve writing on a tablet to annotate a presentation and using screen capture software to create the video.



• **Tablet capture with instructor**. In this method of capture, there are usually 2 capture devices: one for the instructable material, such as a tablet, and one camera to follow the instructor. This allows for the learner to see the instructor as well as the materials at hand.





Camera and Capture device for white board

• **Live capture**. This mode of capture usually involves multiple cameras and can include capture devices. It can be used to capture a live classroom setting, to stage a dramatization, to capture a dialogue, or many other uses.



Eric Lander's 7.00x course with live learner audience, 5 cameras and multiple capture devices.

Best Practices for Recording Video

- Be friendly and conversational. Speak to the camera as if it is a good friend
 or a friendly learner. It's completely acceptable to be informal and natural in
 your speaking.
- When you're making a great teaching moment, look directly at the camera and deliver it. Good eye contact (when possible) is really important to delivering your message.
- When doing tablet capture or writing on a board, feel free to draw and make notes on your slides. Editors can help speed up long drawings or animations. Keep it lively.
- Make excellent quality audio. Your video is only as good as your audio. Make sure to try and record in a quiet environment without a lot of background noise and on a quality microphone.

Your local video department that can speak with you directly about the needs of your individual course. The video team here at edX works with every institution, sharing best practices in video creation. We also work with your video team to handle the details in getting your quality instruction online.

Step 4: Creating Learning Exercises

Online learning exercises create an interactive experience that allows the learner to get immediate feedback on their progress through the material. This section provides an overview of the problem types and feedback available, while Step 5: Create Homework Assignments, reviews the ways in which graded assessments differ from exercises.

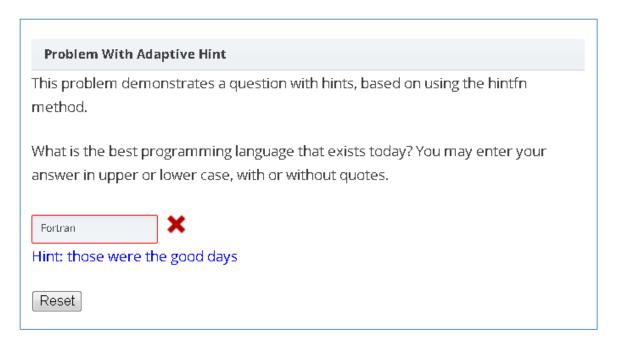
Best Practices for Learning Exercises

Feedback: All these exercises are auto-graded on the edX platform, providing instant feedback to the learners. Studies have shown that this kind of rapid feedback has significant and positive effect on learner performance when compared to no rapid feedback. You can tailor the amount and frequency of information you give to learners on several different levels.

At the most basic level, learners receive immediate information on whether they answered an exercise correctly. You can also tell learners how many tries they've taken on an exercise with a limited number of attempts. We encourage that this number be high to allow learners to address their misconceptions.

In addition to allowing learners access to answers, you can write as much as you would like in the solution space of a problem type. For solutions, some courses walk through the derivation of the answer, while other courses provide general principles of problem-solving or even introduce new lines of thought once a learner clicks "Show Answer".

Some problem types allow you to give learners hints. Your time is best spent by identifying mistakes that reveal common misconceptions (ex: being off by a factor of 100 when calculating percentages) and designing hints to address that particular issue.



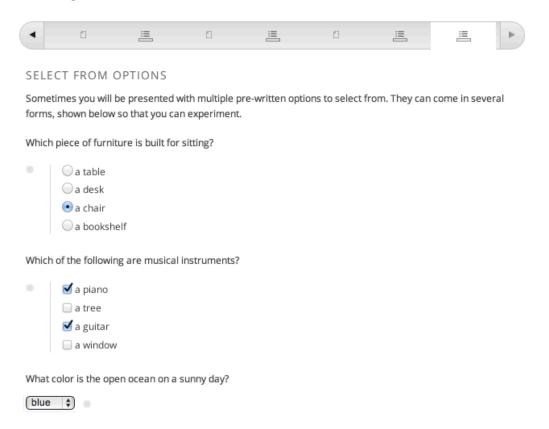
Finally, some courses allot time to include more manual feedback based on the performance of their learners. Office hours in the discussion forums or quick tutorial videos on tough problems are regularly positively received.

Context: Learners can do well if they know why they are being asked to perform a certain exercise. A line of introduction giving this context, or drawing the learner's attention to the video they just watched or are about to watch, can enhance their understanding of the material, particularly if an exercise serves as a transition between one topic and the next.

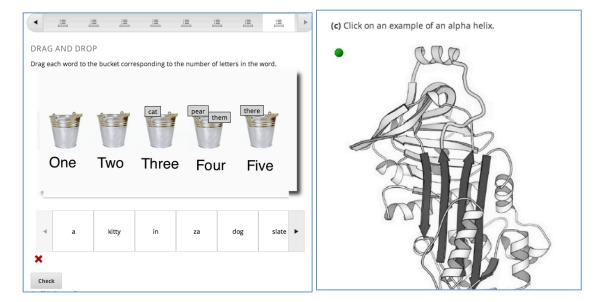
Problem Types Some problem types have a limited set of possible answers, and can serve as checks on whether learners have been following along in the material. Other problem types ask questions with a wide range of possible answers, discouraging random guessing but still allowing the learner to attempt a problem repeatedly until they can arrive at the right answer.

The following survey of problem types goes roughly in order of increasing complexity to the learner. You can use them to check on understanding, introduce new concepts, walk learners through derivations, provide applications of what the learner just viewed, and more. Just keep in mind where the exercise is in the learning sequence.

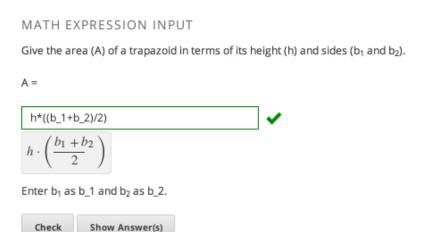
There are a number of ways to ask learners to distinguish between a set of
pre-written options. Multiple Choice, Checkbox, and Dropdown Menu
problems have a finite number of possible answers, and can be allow
learners to quickly check their understanding in the middle of a learning
sequence.



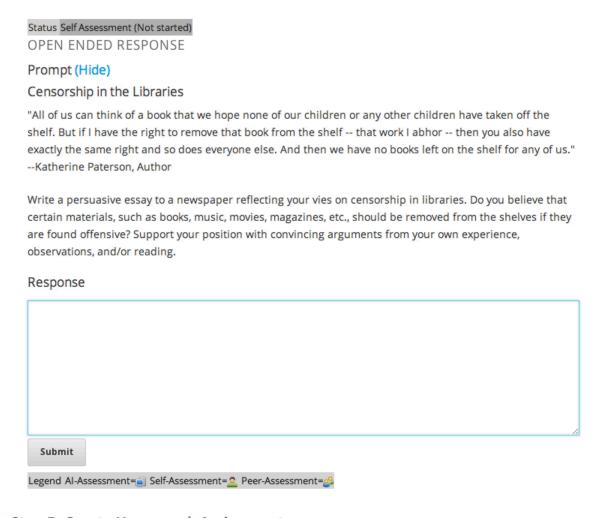
 Assessments with graphical components can link learners more directly to the material while still choosing from a finite set of possible answers. Image Mapped and Drag-and-Drop problem types allow learners to interact directly with a graph or picture.



- Problem types that prevent random guessing are a powerful tool combined with automatic grading. **Text Input** (fill-in-the-blank) and **Numerical** (enter a number) problems can allow an infinite number of tries without guaranteeing a correct answer.
- **Math Expression** problems prompt learners to understand the relationship between values instead of focusing on calculating the final result.



• Finally, course teams and edX have collaborated to deliver auto-graded, **Open Ended** essay questions to learners.



Step 5: Create Homework Assignments

Homework assignments are comprised of similar problems to exercises, but homeworks typically have set release dates and deadlines, delay feedback, and are more challenging. Solutions can be made automatically available after the due date. These constraints will encourage learners to work on homework at the same time, while permitting them to freely discuss the problems after being graded.

Keep in mind that your learner body is global, especially when designing graded work. Exam and homework time periods are typically more lenient than in-class deadlines to allow for differences in internet connectivity, time zone, and individual schedule. In addition, culture-specific references or open ended phrases like "predict the result" may be more difficult to interpret, particularly if limited feedback or solutions are available while answering.

Step 6: Include Online Textbooks

We urge you to work with the publisher to provide a free electronic copy (PDF) of the book you use in your course. If a free book is not available, try to use a different textbook, or add enough resources in the course that a textbook is no longer required.

We encourage you to include links to relevant parts of the textbook below videos and exercises in your courseware. In general, try to provide a number of rich, interlinked set of resources to the learner and encourage them to go to the textbook by pointing to textbook problems in the assignments.

Step 7: Being Social and Discussion Forum Guidelines

Being Social: How to Use Your Course Discussion Forum and Social Media

The operative word for MOOCs is "connect" – they can connect students around the world with you and with each other. Research done by David Pritchard, Lori Breslow and Andrew Ho at MIT and Harvard has shown us that when students connect with each other as "study buddies," they are more likely to be successful in their online courses. EdX has also received positive feedback from students when professors have reached out to communicate during courses. What does this mean for you? How can you help your students be more successful? The starting point is your course's online Discussion Forum, where you can rally your students even before the course gets underway. Other powerful tools at your disposal are Meet-Ups, Facebook, and Twitter.

Discussion Forum

Once your course is online, you can post a suggestion that students introduce themselves on the Discussion Forum by telling where they are from, and encourage them to find another student, or a few, with whom they can work. They can work together remotely in pairs or small groups by communicating online, or they may choose to try to connect by telephone or in person (see discussion about "Meetups" below).

Throughout your course, you can utilize your Discussion Forum to connect with your students by providing encouragement, especially before big assignments like exams.

Facebook

EdX instructors have used Facebook to publicize their course. Some university departments have their own Facebook pages, and some professors use the university Facebook page. You can utilize these existing resources and coordinate with your school and department to post information about your course to promote registration.

Twitter

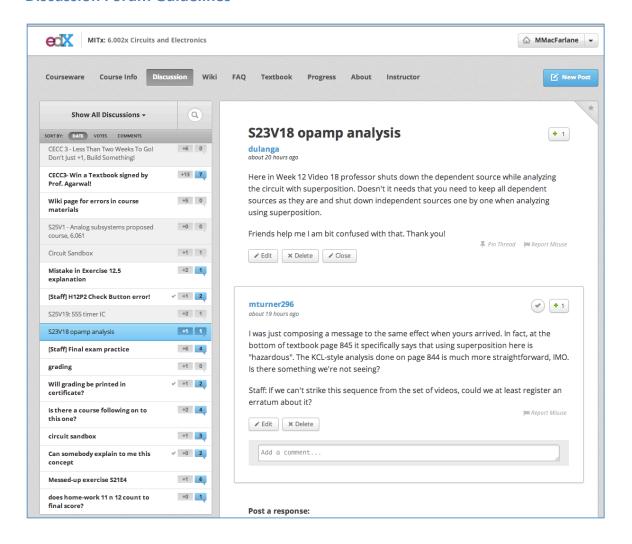
Similarly, does your university or department have a Twitter account? You can tweet to promote registrations for your course, as well as to provide encouragement to existing students.

Meetups

Throughout your course, but especially at the beginning, you can encourage your students to create a "Meetup" wherever they are located in the world, at local coffee

shops, libraries, etc. (Go to www.meetup.com to learn more, and share this link with your students.) Again, the Discussion Forum is a good vehicle to communicate this initiative. It is important to remember that you have students registered from across the globe, and you want to help them connect with each other for a rich course experience. Think globally, but act locally.

Discussion Forum Guidelines



The Discussion Forum is a critical component of an online course. Here, learners ask questions, help each other and comment on various components of the course. As mentioned earlier, discussion opportunities can be embedded within the learning sequence as well as in the forum prompting learners to post their thoughts as they encounter topics.

We encourage you to spend a significant amount of time on the discussion forum as it is a great place to communicate with learners. After a few weeks of the course, forums tend to become self-supporting in terms of peer learning. In the initial weeks

however, it is critical that you and your team monitor the forum and create its culture. Even after learners begin to support each other, there will always be questions that only course staff can answer. No issues should go completely unaddressed – even if it is simply to acknowledge an issue that can only be fixed the next time the course is offered. Learners want to be heard and understand why things are done the way they are; they always appreciate and can use guidance from the instructor(s) throughout the course.

We also encourage you to invite some learners who are doing well in your current class or in your previous class to serve as Community TAs on the forum. These learners are very helpful to their peers and have generally found the experience very rewarding.

7/3/13 V. 1.0 31

Step 8: Certificates of Mastery



Learners who successfully pass an edX course receive a Certificate of Mastery. EdX is in charge of issuing these certificates. To create certificates, we will need from you, the instructor:

- o The preferred spelling of your name
- Your title
- A high resolution scan of your signature