Guidelines for Students Completing OCW AP Feasibility Study

MIT OpenCourseWare (http://ocw.mit.edu) is a free and open educational resource. We publish MIT course materials – videos and audios of lecture presentations, lecture notes and slides, homework assignments, practice tests, and more – on our website for educators, students and self-learners from all over the world.

Our goal is to determine whether the MIT course material published on OCW would be a valuable resource for the millions of high school students studying for Advanced Placement (AP) classes/exams, who currently account for about 10,000 of the 2.2 million visitors per month to OpenCourseWare. We aim to provide these students with a simple guide to the resources available from MIT, structured around the AP curricula that they’re already familiar with, without them having search through multiple OCW courses and wade through a large amount of extraneous material to find information on a given topic.

This is where you come in. We’ll be asking you to look through one of MIT’s introductory courses in Chemistry, Calculus, Physics or Biology to see how well the MIT courses map to the AP courses. You’ll simultaneously be evaluating the MIT course materials (at this point just lecture notes and video and audio lectures, not problem sets and exams) for their utility to a student taking an AP course. We will later be asking high school students to give their own evaluations, but yours are very important too.

The framework that we’ve devised, described below, is based on our having gone through some of the video, audio, and lecture notes we’re asking you to examine. Though we’ve come up with a framework we think will both provide us with the information we need and be as simple as possible for you to complete, if you have suggestions that you think would improve the process, we’d like to hear them. We’ve scheduled a check-in point just a few days after we’re asking you to start, and that’s your opportunity to let us know how you’re progressing, what makes sense, and what doesn’t.

OCW will reimburse you for your time at a rate of $12/hour. Please keep careful track of how much time you are spending on your work. Each video/audio lecture should not take more than an hour or so, and probably less.

Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tues, Feb 13</td>
<td>Orientation</td>
<td>at the OCW offices. If you can’t make this orientation, please try and visit the OCW office some other time on Tuesday.</td>
</tr>
<tr>
<td>Fri, Feb 16</td>
<td>Check-in point</td>
<td>Please send in to <a href="mailto:ocw-se-ap@mit.edu">ocw-se-ap@mit.edu</a> (which will reach Rana and Kayla) what you have completed, along with a short assessment of the process by which you are completing it. How long has it taken you to complete what you’ve completed? Is there any way you could be doing the work better/faster? Do you have any questions or suggestions?</td>
</tr>
<tr>
<td>Wed, Feb 21</td>
<td>Check-in point #2</td>
<td>The sequel!</td>
</tr>
<tr>
<td>Wed, Feb 28</td>
<td>Project completion</td>
<td>Please send your completed sheets in by email by the end of the day. Also, please include a couple of paragraph with design suggestions – how would a high school section best be constructed, in your opinions? What did you feel were the main questions to keep in mind while doing this work? What other ideas do you have? Also, please include a couple of paragraph with design suggestions – how would a high school section of OCW best be constructed, in your opinion? What did you feel were the main questions to keep in mind while doing this work? What other ideas do you have?</td>
</tr>
</tbody>
</table>
Breakdown of Classes

There will be one other student working through the same material as you, so that we get more than one perspective on the material.

8.01 (AP Physics C – Mechanics)

8.01 F99 Lecture Notes, Video
8.01 F03 Lecture Notes
8.01L F05 Lecture Notes

8.02 (AP Physics C – Electricity and Magnetism)

8.02T S05 Lecture Notes
8.02 S02 Lecture Notes, Video
8.022 F04 Lecture Notes
8.02X S05 Lecture Notes (*not* labs)

The video here shouldn’t take a very long time to do, as detailed topic indices exist.

7.012, 7.013 and 7.014 (AP Biology)

7.012 F04 video lectures and lecture notes
(note that there are lecture notes for lectures 2, 5, 6, and 14 under “Study Materials”)

-OR-

7.013 S06 audio lectures and Biology Terms
(note that there are Biology Terms sheets for many of the lectures)

-OR-

7.014 S05 video lectures

5.111 and 5.112 (AP Chemistry)

5.111 F05 video lectures and lecture notes
(note that there are lecture notes for each lecture, next to the video links)

-OR-

5.112 F05 video lectures and lecture notes
(note that there are lecture notes for each lecture, next to the video links)
Before you Begin

Before you begin, take some time to re-familiarize yourselves with the AP topics (see attached). Some of them may be slightly vague, like “water” (the first Biology topic), so be sure that you understand the context in which a high school AP Biology course would talk about water, so that you can identify when the topic is covered in the resources you’ll be looking at.

Writing down your findings on a spreadsheet

Along with this document, you’ll receive a spreadsheet in *.xls format with some sample topics outlined for physics, or find a version online at http://spreadsheets.google.com/pub?key=pBUiVFUlrvdIkOMghGlkYw

Please use this document as the basis for your own spreadsheet.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Resource</td>
<td>Starting Point</td>
<td>Section Topic</td>
<td>Description</td>
<td>AP Topic #</td>
</tr>
<tr>
<td>2</td>
<td>8.02 S02 Video Lecture 16</td>
<td>Overall</td>
<td>A clear introduction to electromagnetic induction and Faraday’s law</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>8.02</td>
<td>Course administration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>8.02</td>
<td>Electromagnetic induction</td>
<td>Electromagnets induction current can be</td>
<td>E1</td>
<td>Very clearly explained overview of phenomenon. Need basic integrals for flux</td>
</tr>
<tr>
<td>5</td>
<td>10.26</td>
<td>Demonstration of electromagnetism</td>
<td>Demonstration with bar magnet and coil</td>
<td>E1</td>
<td>Excellent demonstration. Very clear</td>
</tr>
<tr>
<td>6</td>
<td>13.31</td>
<td>Faraday’s law</td>
<td>Definition of Faraday’s law. Summary of E1</td>
<td>Good definition. Need to know basic derivatives and integrals</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>22.45</td>
<td>Using Faraday’s law</td>
<td>Example using open surface attached to</td>
<td>E1</td>
<td>Not a thoroughly worked-through example</td>
</tr>
<tr>
<td>8</td>
<td>27.16</td>
<td>Demonstration of Faraday’s wire loop around solenoid (Shape of coil</td>
<td>E1</td>
<td>Great demonstration</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>32.42</td>
<td>Non-conservative</td>
<td>Changing magnetic flux = non-conservative E1</td>
<td>Interesting! Eccentric topic and probably not covered by AP, but might be good</td>
<td></td>
</tr>
</tbody>
</table>

**Resource**: Here’s where to put the course and lecture number of a resource. For example, “8.02 Spring 2002 Video Lecture 16” or “18.01 Fall 2005 Lecture Note 4.”

**Overall (to be completed immediately after finishing the rest of the resource’s evaluation)**: What’s your overall impression about this resource? Any other comments?

**Starting point**: Here you’ll either be entering the start times of a section (for video and audio lectures; e.g. “10:29” in MM:SS form) or a page range (for lecture notes; e.g. “p. 2 slides 3-4”). Try to be as specific as possible without going to millisecond accuracy.

**Section Topic**: What topic does the section cover? This name can be of your own choosing, or one the professor uses. Content is what’s important.

**Description**: A short, 2-3 sentence description of the section. Not just what is covered in the material, but also how it is presented (with an example, demonstration, figures, etc).

**AP Topic #**: Using your AP Course Topic List, identify and enter the AP topics that correspond with this topic (e.g. . It is acceptable to enter more than one AP topic, though we discourage you from doing it too much; if you do, put the topics in descending order of relevancy. Be sure to note in the next section, “Usefulness for HS,” whether the topic is thoroughly or only briefly covered.

**Usefulness for HS**: Use this section to evaluate the MIT materials you’ve identified with regard to how useful they might be for High School students. Your evaluation shouldn’t be more than about 4 sentences long. When evaluating, keep the following questions in mind:
1. Is the material clearly presented?
2. Is the material on an AP high school level? Higher? Lower?
4. Would this be helpful practice to a student studying for the AP test?
5. Is it easy to find the AP topic within this material?
6. Does the resource pre-suppose knowledge a high school student is unlikely to have? (e.g. Differential equations are used.)
7. Does the professor use examples to shed light on the topic? Are these examples relevant? Easily understood by a high school student?

**Tips for Going through lecture notes**

1. Skim through the entire lecture.
2. Go back through the lecture in more detail, identifying the topics covered in the lecture. Does the entire lecture cover just one topic, or are multiple topics covered in the lecture? If so, outline which pages each topic spans. The topics that you come up with may not exactly match what the AP curricula identify as topics, so you might have to determine exactly which topic is covered. Some topics covered in MIT courses might not appear in the AP; for example, proteins are heavily covered in the MIT biology curriculum, but very lightly in the AP curriculum.
3. If it seems as though a section of the lecture touches upon two (or more) topics, try and determine what the primary topic is, using the context of the rest of the lecture as a guide. If you still can’t decide, or if you think it is vital place the section under both topics, you can write in both AP topics. Make sure your commentary notes how both topics are covered in a section.

**Tips for Going through Video and Audio Lectures**

(Except Walter Lewin’s Physics Video Lectures)

1. Look through the lecture’s Lecture Notes, if they exist. This will give you a rough outline of the video/audio lecture, even if they don’t correspond exactly.
2. Begin watching the lecture.
3. Identify the topic the lecturer is covering. On your topic sheet, look at the topics that are grouped together with that topic – as topics are grouped around larger themes, these are the topics most likely to appear after the topic you’re looking at. This will remind you of the AP topics and help you identify them when they appear in the lecture.
4. Note when the professor changes topics. This could mean that they switch blackboards, stop talking for a minute, or they might segue so naturally that it’s hard to tell when they are moving on to a new topic (Of course, you won’t be able to use visual cues for audio lectures). In running through some examples, we found that usually we missed the exact switching point when watching, and had to rewind to find the exact location. There may be no changing of topics at all; the entire lecture may only cover only one topic. Still, there will probably be subtopics that may be useful to outline.
5. If it seems as though a section of the lecture touches upon two (or more) topics, try and determine what the primary topic is, using the context of the rest of the lecture as a guide. If you
still can’t decide, or if you think it is vital place the section under both topics, you can place the section under two different topics.

Going through Walter Lewin’s 8.01 Video Lectures

1. Detailed topic indices with time stamps already exist for this course. Your job will thus be quite easy: you need only read through the topic indices to glean what topic was being spoken about when, and then write the class, lecture number, and time span within the lecture below the appropriate topic. You can copy and paste the information directly from the web page onto your spreadsheet.

Going through Walter Lewin’s 8.02 Video Lectures

1. You will not be completing as detailed an analysis and mapping for this set of video lectures. The video lecture page for the 8.02 videos includes a list of the 3-6 topics covered in each lecture, and these topics include almost every AP topic (though many topics in the Lewin Lectures are not included in the AP topics). Under the appropriate AP topic, write the corresponding class and lecture number. At this stage, we won’t ask you to actually view the lectures and glean the exact time span when each topic was covered.

That’s about it! Please e-mail ocw-se-ap@mit.edu (which will reach Rana and Kayla) with any questions, comments, suggestions, or chocolate chip cookie recipes. Thanks very much for your work – it’s a great help!