

10 Tips for Developing and Teaching Online Science Courses from Distance Learning Pros

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When developing an online science course, there are many considerations to be taken into account that will greatly influence its effectiveness. Some may think, “This will be easy! I don’t have to be there physically, so that cuts out a bunch of time, right?” In reality, without the face-to-face contact with students in a typical classroom setting, there needs to be much more individualized time dedicated to helping students outside of regular school hours. Careful planning is essential, and made easier with advice from faculty experienced in developing and teaching online science courses.

The top 10 tips

Here are the top 10 tips we collected from professors experienced in developing and teaching online science courses. They can help you create a great distance learning experience for you and your students.

- 1) **Know your audience**—When choosing which courses to put online, knowing your students’ backgrounds (working parents, military, etc.) and skill levels (major vs. non-major) is key in helping create a beneficial learning environment for all. The fact that you will not be speaking to students in a live setting to instantly address their needs has to be taken into account, and requires more attentiveness and flexibility on your part as instructor.
- 2) **Decide on the perfect science course**—Try to start by converting a course that you have already taught in a classroom setting. Teaching online is hard. Teaching a lab online is even harder. You do not want to be learning a new course and how to teach online at the same time.
- 3) **Be VERY thorough in your expectations from Day 1**—Lay out the course before you even start the class. We know this sounds obvious, but even looking at things such as lab timing and the specific materials needed throughout the semester can make an online class run smoother day to day. Try to lay out the assignments and labs (with expected timing of each) early on. Be very consistent and up front with deadlines from the start of class.
- 4) **Lab work**—One of the largest hurdles in teaching an online lab science course is lab work. There are a variety of hands-on kits available that replicate brick-and-mortar experiments and can be done in a student’s home. To check out some examples of these, [visit our website](#). There are virtual labs available that act as good supplemental material as well. Make sure you work through these labs on your own and answer all of the questions during course development. This is a great way to anticipate problems that students may have and to see if these labs truly fit what you are trying to have students accomplish.
- 5) **Decide on a clear, fair grading strategy**—This tip may seem pretty straightforward as well, but is very important for online learning. Questions such as “How many points should a lab be worth?” or “What is the lab policy on missing a lab?” are valid concerns that do

not directly translate from the classroom to an online setting. Specifically for online labs, have requirements throughout that ensure students are actually doing the labs at home. For example, students can take pictures at certain steps and submit them as part of their lab report (with a name, date, and course number written on an index card in the picture as well).

- 6) **Use visuals and videos**—Providing short pre-lab videos, procedural videos for different activities, and multiple visuals and images throughout different parts of the course are small things that can keep students engaged. Let students know what they will be doing and what they need to look out for throughout the course. This also increases your presence as an instructor and can make students feel more connected.
- 7) **Make time and be available**—Giving students access to you via email, and even phone, and promptly responding to their questions is the most challenging, but one of the most important, aspects of online teaching.
- 8) **Set up one-on-one meetings**—Going along with the previous tip, a phone or Skype® meeting (either regularly, if the class is small enough, or on an as needed basis) can be helpful to go over any specific questions or progress issues the student (or instructor) may have. This can vary depending on class size and the issues that arise with the course. Think of it as providing virtual office hours to your students.
- 9) **Discussion boards**—These are a great way to keep students interacting and more connected with their classmates. Students can respond to others' answers and feed off of each other's ideas, allowing for more effective learning and the sense of being in a "real classroom."
- 10) **Be flexible, especially early on**—Distance learning is a huge adjustment for

instructors, and presents a huge learning curve to students as well, especially for the lab portion of the class. While you are still going to expect students to follow rules and meet deadlines, there is a world of issues that can arise from taking a course online that may be out of students' control (lab kit problems, interface issues with your learning management system, or just life in general). This is where making time and being available really come into play. Know what your students are going through by regularly keeping in touch with their progress and overall activity in the class. It can help you determine if a student is just pulling your leg when he says his computer crashed, or if he is sincere. So within reason, being understanding can go a long way toward helping students be successful once they have settled into the course.

We hope you have found these tips helpful. Special thanks to Alanna Tynes (Lone Star College), Richard LaBennett (North Carolina Central University), and Adam Authier (and the faculty at Schoolcraft College) for their thoughtful input on teaching and developing online science courses.

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