

# DESIGNING YOUR FIRST CLASS

You've started your first position as an assistant professor and have been assigned your first class with real students.

- What do you do?
- What teaching method do you use?
- What level do you aim for?
- How do you structure the class?
- How do you pick a textbook or other readings?
- What do you ask on tests?
- How much can you cover in a semester?
- How many tests and how much homework do you require?
- How do you grade?
- How do you behave toward the students?
- How much time will this take you?
- Why didn't someone tell you how to do this?

This chapter provides an overview of what a professor does in designing and teaching a course, and it raises a number of questions about the process. Finding some answers to these questions is the goal of the remainder of this book.

## 3.1. SUMMARY AND OBJECTIVES

After reading this chapter, you should be able to:

- List the salient features of different types of engineering courses.
- Enumerate the activities which need to be completed before starting a course.
- Discuss how a course is started.
- Explain the importance of the second class period and discuss appropriate activities.
- List the other important activities which occur during the semester. Explain the importance of each of these activities.

- For the preceding items discuss some of the important questions which the professor should consider when designing a course.
- Practice positive self-talk if you feel like an imposter.

### 3.2. TYPES OF COURSES

Engineering professors teach a variety of courses. Since course design is often different for different types of courses, it is useful to categorize courses. Required undergraduate courses that are prerequisites for other required courses tend to have the most structured content. It's likely that a curriculum committee will select the content and even the textbook. Professors who teach succeeding courses care about how well the introductory or prerequisite course is taught and the extent of the coverage. So it's a good idea to ask them what they expect. In teaching these courses you'll likely have less freedom in coverage. Balancing this, it is highly likely that past syllabi, homework, tests, lecture notes, and a recommended textbook will be available. Past instructors will be available for some assistance if asked, but you'll probably have to ask since few faculty volunteer teaching help unless asked. Often, these classes may be rather large, and student abilities will vary widely.

Required undergraduate courses which are not prerequisites for other courses are similar but have a few differences. The course content is a bit less rigid, and other professors have less of a vested interest in what is taught. These are often senior courses, which means that very weak students will not have made it this far. However, graduating seniors are notoriously difficult to motivate. Past syllabi and a textbook are probably available, but there is less pressure to follow them closely.

Required or core graduate-level courses have all graduate students in them, and class size varies from small to medium. A syllabus probably exists, but you usually are free to change it. Invariably, the amount of material to be covered is staggering, and textbooks may not be available. The research professors in the department are often very interested in the content and how well the students learn the material. These courses often give a good opportunity to get to know and impress new graduate students before they pick research topics. In some departments these courses may be considered "plums."

Undergraduate electives and dual-level undergraduate-graduate electives if offered regularly will have a sample syllabus, textbook, and tests available. Professors who have taught the course in the past are probably available for advice. Since electives are rarely prerequisites for other courses, you can usually change the syllabus and textbook. Class size is usually small to medium, and since students selected the course they tend to be interested. Overall, these courses offer a good beginning to an academic career.

Graduate-level electives and seminars are the most open in content coverage. These courses may be very specialized, and other professors often pay little attention to them as long as their graduate students don't complain too loudly. The freedom involved in selecting course content is very liberating but also daunting since well-developed syllabi, homework, test examples, and a textbook probably are not available. The classes are usually small, and the students are likely to be both intelligent and interested. The teaching of graduate electives in one's research area is an effective way to integrate teaching and research. However, professors often compete to offer these courses, and new professors may not be given the opportunity immediately.

Design courses, particularly capstone design courses for undergraduates, tend to be somewhat different from other courses. They may be taught with case studies and often are loosely structured. The workload is often high because of grading demands and the need to develop new case studies. Design courses are also sometimes associated with laboratories, which can further increase the large workload. Professors with industrial experience are often assigned to these courses (see Chapter 9).

Laboratory courses usually differ markedly from all the other types of courses (see Chapter 9). The laboratory course may be attached to another course and may or may not be administered separately. It also tends to be tightly structured since the experiments or projects are limited by the available equipment. But the equipment is often old and may not work well. Experimental write-ups are available, but always need modification. For safety reasons, the section size is usually controlled. Since teaching lab courses tends to be an unpopular assignment, the department head may staff the lab with new professors since they are most likely to accept the assignment gracefully. Although the course is required, the material covered is usually not a critical prerequisite for follow-up courses. Teaching involves a great deal of informal contact with students and extensive grading of laboratory reports; little if any lecturing is done. Some schools have added a communication component by adding a credit hour and a lecture on writing and speaking. The often extensive report writing in the course makes it a natural place for teaching such skills.

### 3.3. BEFORE THE COURSE STARTS

Several tasks normally need to be completed before the course starts (exceptions occur when students are heavily involved in planning the course). Some may be done for the professor if the course is well established, but with new courses all these tasks need to be at least partially completed before classes start.

#### 3.3.1. Knowing the Audience

Talk to the undergraduate advisor in your program to find out as much as you can about the students in your course. Are most of them sophomores, juniors, or graduate students? What prerequisite courses are they supposed to have taken and are the prerequisite requirements enforced? What other courses are they taking concurrently? Are they mostly full-time or part-time students? Are they majoring in your field or are they still searching for a major? How mature are they? How many have industrial experience from co-op or an internship? In general, is it likely to be a good or poor class? The more you know about the students, the better you will be able to plan the course and select the appropriate level for the material. Student characteristics are discussed in detail in Chapters 13 to 15.

#### 3.3.2. Choosing Course Goals and Objectives

What should the students know and be able to do at the end of the semester? This question includes both coverage of the content and the ability to *do something* with the content. Goals are relatively broad, while objectives tend to be quite specific. Your goal may be that students understand the control of systems, whereas an objective may be that they know how to use

the Laplace transform in the analysis of linear control problems. The goals and objectives must satisfy what is expected for subsequent courses. The development of goals and objectives for a course is important since it controls the coverage and, to a lesser extent, the teaching method (see Chapter 4). The most important part of a class is the content covered because it makes no sense to do a wonderful job teaching unimportant material. A part of the goals and objectives for the course is the choice of the level at which to present the material. New professors are notorious for setting the level too high and being too theoretical. The choice of an appropriate level for a class is complicated (see Chapters 14 and 15). Appropriate goals and objectives depend on departmental goals and ABET accreditation; for example, since ABET accreditation requires graduates who are good communicators (see Section 4.6), writing and speaking should be incorporated into at least two the department's courses. Discuss with the department's ABET coordinator which ABET criteria should be taught and assessed in your course. Existing courses may have explicitly stated goals and objectives. For new courses syllabi posted on the internet can provide ideas of what and how much to cover.

### 3.3.3. Picking a Teaching Method

Once you know what you want to accomplish, you can choose a teaching method congruent with your style and with the students' learning styles and with learning principles (see Chapters 13 and 15). Lecturing and various modifications of lecturing (Chapter 6) are by far the most common teaching methods in engineering courses, and in most universities will be acceptable to the other professors in the department. Lecturing is also one of the easiest methods to use the first time you teach a course, partially because everyone is familiar with the method. But it is not the best method for many of the goals of engineering education. For example, if one goal of the course is to have students become proficient in working in engineering teams, then lectures need to be supplemented with group work (Chapter 7). No matter which teaching method is chosen, you need to check the classroom ahead of time to be sure that it is large enough and that appropriate equipment will be available.

### 3.3.4. Choosing a Textbook

The quality of the textbook will have a major effect on the quality of the course and on what can be conveniently covered. Unfortunately, textbooks may be selected months ahead of time because of bookstore requirements. For new professors who arrive a week before the semester starts, the book has probably been chosen by someone else. For required undergraduate courses a committee may select the book. If you do not like the textbook, plan to select a new textbook (Section 4.6) for subsequent semesters, but do *not* tell the students it is a poor book. Since many publishers have started to publish US and international editions that have different homework problems, inform students that they need access to an appropriate edition for the homework assignments.

### 3.3.5. Preparing a Tentative Course Outline

An outline of the entire course in advance is helpful but not essential. If time is short, outline at least the first month so that you and the students know where you are going. A complete

course outline lists topics for each day. This requires that you estimate the rate topics will be covered, which is difficult, although easier if you follow the outline of an experienced professor. If you list daily topics it is useful to build in one or more open periods, or periods that can be skipped before major tests. An alternative is a partial outline that lists tests, quizzes, and student presentation days but not lecture topics. For both types of outlines you need to decide on the number and dates of tests and quizzes. Every school has breaks, student trips to conventions, and major extracurricular activities. Do you want to adjust your schedule for these events? Also, look at your calendar and adjust the class schedule if you will be out of town. Although many faculty schedule exams when they will be out of town, we suggest in Section 11.2 that professors should be present on exam days. If most of your students are scheduled in the same courses, it is useful to attempt to coordinate exam schedules with the professors teaching the other courses. In a required undergraduate course you will probably adapt the existing course outline with modest changes.

### 3.3.6. Deciding on a Grading Scheme

Students want to know how much quizzes, tests, a final, homework, computer problems, and projects will count. Will there be extra credit? Will you follow a 90-80-70-60 scale or will you use a curve? In our experience most students are satisfied if given an outline of the grading method. We suggest using 90-80-70-60 or similar scale as guaranteed grades, but reserve the option of using lower cut-off points. Grading is discussed in Chapter 11.

### 3.3.7. Arrange to Have Appropriate Material Available

Appropriate material includes the textbook and supplementary books, handouts, and solutions to homework and tests. Copies of these materials should be available to students in a library or learning resource center. Materials that you prepare for the class and expect students to download (formerly known as handouts) should be available on the class website or learning management system. Be sure the library or learning resource center has a copy of the textbook and that it is placed on reserve so that it cannot be checked out. Most major book publishers will supply a free textbook and solution manual for you. If possible arrange to have one copy at your office and a second at home. If asked, the publisher may also provide free copies for the TAs.

When making copies of any material, you need to be concerned about copyright laws and fair use (Brewer, 2008). "Broadly speaking, a 'fair use' is one where the socially beneficial results of the use outweigh the exclusive rights of the copyright holder." The law requires the following four factors be considered:

1. "The purpose and character of the use, including whether the use is of a commercial nature or is for nonprofit educational purposes;
2. The nature of the copyrighted work;
3. The amount and substantiality of the portion used in relation to the work as a whole; and
4. The effect of the use upon the potential market for or value of the copyrighted work" (Brewer, 2008).

If in doubt, it is always legal to send the students to the library to look at a legally purchased copy or to have the students access a web page that contains a legal copy of the material.

### 3.3.8. Developing Your Attitude or Personal Interaction Style

It helps to be enthusiastic and to believe that teaching is an important and even noble activity. How much personal warmth and caring will you show to the students? What, if any, is your responsibility for helping students grow? Is it important to you to be loved, or is respect sufficient? Do you believe all students can learn, or is removing students who cannot learn part of your job? Great teachers are marked by a deep commitment to their students. Your attitudes and style will have a major effect on your rapport with students.

### 3.3.9. Imposter Syndrome

Many people when faced with a new challenge feel like imposters. For example, a new engineering graduate reporting to work may believe "I have fooled them in school, but now that I am in industry they are going to find out that I don't know anything about engineering." A newly minted PhD reporting to a postdoc may feel, "I got by in my PhD research, but this is the real thing and they are going to find out I'm a fraud and don't know how to do research." The new assistant professor is older, but often no wiser. Preparing to teach the first class he or she admits "I don't know anything about teaching and I don't really understand the material. The entire class will know I'm an imposter." If any of these scenarios sound like you, then you are suffering from the imposter syndrome.

The process you endured to become an assistant professor—earning a BS and PhD in engineering, probably doing a postdoc, and surviving the interview process—is very rigorous. Imposters do not survive. Become as prepared as you can be for the first class and use *positive self-talk* and *power posing* to combat feeling inadequate because of the imposter syndrome. Positive self-talk is a method used by athletes to perform their best. It consists of reminding yourself that you have repeatedly proved that you belong in the academy and are well prepared to teach this course. Power posing, changing one's body language to exude confidence and power, changes the way people are perceived (Cuddy, 2012). Power posing such as standing with feet spread and hands on hips (known as the Wonder Woman pose) or standing with feet spread leaning forward with hands on table increases cortisol and testosterone levels in the brain and makes the person look and act more confident (Carney et al., 2010). To overcome imposter syndrome, privately stand tall and proud with arms uplifted in a V-shape for two minutes before class. Other aspects of body language are discussed in Section 10.2.3.

Once all tasks are taken care of, you are ready to start. It is usually desirable to have these chores done before class starts, but fortunately some of them can be partially delayed until after the semester starts.

## 3.4. THE FIRST CLASS

It is traditional to start the first class with "housekeeping chores." There are other ways to start a class and these will be discussed at the end of this section. Housekeeping chores are routine and non-demanding. They allow students to get settled in, but this is not an exciting way to start a class. Use the whiteboard to write down information and leave it on the board. Then latecomers (and there are always latecomers on the first day of class) can get the information without interrupting the class.

We also pass out a copy of the syllabus. Although we place most handouts on the web and do not pass them out in hard copy form, the syllabus is your contract with students and it is important that you know students have a copy. The syllabus should give the students all the information about the course structure that they need (Davis, 2009; Matejka and Kurke, 1994; Wankat and Oreovicz, 1999). The following items probably should be included:

1. *Course name and number.* If you are teaching first year students you will be surprised by the number of students who come to the wrong classroom. Also list the hours and the class location, particularly if two locations are used.
2. *Professor's name, office location, office phone number, e-mail, and office hours.* In the United States the way you present your name is important. If you write it as Professor Jones, the students will call you Professor Jones. If you write Carol or John, they will call you Carol or John. On the other hand, in New Zealand first names are used, while Germans are quite formal in the use of titles. You need to select your office hours before the class starts. Try to choose office hours that will be available to most students. If you welcome cell phone calls, give your cell phone number. If you don't want to be called on your cell phone, don't give your cell phone number! If e-mail is encouraged—and we think it should be—give your e-mail address. Ask the students to list the course number in the subject line so that you can quickly identify e-mail from your students.
3. *TA names, office hours, and location of their office hours.* Give the students the TAs' e-mails, but do not give the students the location of the TAs' labs. Introduce the TAs if they are present.
4. *Prerequisites.* Discuss how important these prerequisites are. Will you accept an F or a D or an incomplete in a prerequisite course? (Check your department's policy ahead of time.)
5. *Textbook.* Discuss any other supplementary material that the students should buy or that is available in the library. Pass out or post on the web a reading list if you use one.
6. *Tentative course outline.* Discuss the course outline and note the dates of tests and due dates of major projects. The earlier you give this information to the students, the fewer problems you will have with conflicts. Note: the course outline should *always* be labeled TENTATIVE. Labeling the outline as tentative gives you the option to later change dates if necessary.
7. *Teaching method and expectations of the students.* If 99% of the students' courses have been lectures and you will lecture, this can be very brief. If your course will be different, added discussion will be valuable.
8. *Grading scheme.* If you don't discuss the grading scheme, the students will ask about it. Be prepared for a question on extra credit.
9. *Seating arrangements and names.* If there is to be a seating chart, describe how it will be set up. Start learning student names unless there will be a large turnover the first week. Seating is not discussed at the beginning of the period since not everyone will be on time. If it is important to you that the students know that you care about them as individuals, then you *must* learn their names fairly quickly. Some teachers memorize the seating chart, others use photographs of students, some call the roll the first few weeks, and some ask questions using the class list. If discussion or group work will be important, you may want to use some method which

introduces students to each other. Various types of “name games” can be used to do this. Students can introduce themselves or others. Many students will appreciate a copy of the class roster.

10. *General discipline and classroom incivility policies.* Always enter the class with a positive attitude toward your students (see Chapter 12). However, it’s likely that one or two students may pose problems, so briefly discuss the rules the class must live by. What is the policy about cheating, being late, being absent, cell phones, photographing the white board, surfing the web, reading a newspaper, or sleeping in class? What will your policy on makeup exams be? Be sure that your policies do not conflict with university and departmental policies.
11. *Assignments.* Explain the importance of class assignments and grading procedures. Explain your policy on late assignments. Be clear on the policy towards student collaboration on assignments (we encourage student collaboration, but some faculty are adamantly opposed to student collaboration).
12. *Honor code policy.* If your school has an honor code, discuss it.
13. *Extra credit policy.* If extra credit will not be allowed, state this clearly. If extra credit will be allowed, explain what is acceptable and when it is due. Of course, to be fair opportunities for extra credit have to be available to all students. Thus, extra credit after grades are posted must not be allowed.

Ask the class if there are any questions about course structure and policies—be sure to give them sufficient time to formulate questions and respond.

Some professors dismiss the students at this point, but we believe this is a mistake. Start teaching. Send the message that you mean business. The students will not be ready to start business, but they are never ready until you get them started. Use the remaining fifteen to thirty minutes for lecture, discussion, or whatever teaching method you intend to use. What content should be covered? One excellent method that will help motivate many students is to explain the importance and relevance of the material while presenting an overview of the course. Alternately, review a previous course that is an important prerequisite for the course. A third possibility is to start the first lesson. Regardless of the content, present it with enthusiasm and a sense of excitement so that the students will know that you consider the material to be important. Leave enough time for a short summary.

Finally, give the first homework assignment. At the very least the students should start reading. You know that they will not be very busy with homework the first week, and you want them to take your course at least as seriously as the competition. Pass out a sheet with the homework assignment on it. There will be fewer misunderstandings about what is due when. We post all assignments on the web, but it is best to also hand out hard copies of the first assignment. This completes the first class. Tell the students you will see them next class and signal that class has ended. A clear signal, such as picking up your books or saying good-bye, will be useful throughout the semester.

If you don’t like housekeeping, there are other ways to start the first class. In an elective the first class period can be used to develop a course outline with the students’ input. A test on prerequisite material can be given, but this will be unpopular and probably won’t be extremely valid since no one has reviewed for it. The students can be given a problem which they will be able to solve at the end of the course, and they can be asked to work on it in teams.

This works if the importance of the problem is clear. If the course has a major project, you can introduce that project. In electives students can be required to write and turn in a paragraph on why they are taking the course. Your creativity can guide you to other possibilities.

Your attitude toward teaching is very important. If you are enthusiastic and look forward to the class, then the students will tend to do the same. If you have the attitude that it is your job to help students learn and earn a good grade, then you’ve taken a big step toward building rapport.

### 3.5. THE SECOND CLASS

The second class is surprisingly important. Many students consider it the first “real” class of the semester, so it sets the tone. Thus, it is very important for you to be well prepared for it. “Winging it” is always a mistake, and can be a disaster if done while you are still setting the course tone and student expectations. Enter the class with a sense of excitement and be enthusiastic. Avoid scheduling trips the first week of the term so that you can meet your classes.

Classes should always be started slowly so that students can switch gears and start thinking about this class. For starting this and other classes you might:

- Collect homework.
- Practice the names of students.
- Review the previous class.
- Add a bit of humor, if you can do so naturally.
- Show a cartoon related to the day’s subject. A little entertainment before the class starts will not detract from the seriousness of your message.
- Have students make announcements from student organizations.
- Answer student questions from previous classes, reading, or homework.
- Mention a current event that relates to the class. Examples are a strike at a plant, the sale of sensitive computer parts to unfriendly countries, a new automotive design, an explosion and fire at a chemical plant, or a nuclear protest. Be sure to explicitly relate the event to the class.

A slow start is important, but these activities should last only a few minutes. Don’t allow the students to lead you off on extensive tangents. During the remainder of the class cover the content listed in the course outline using the teaching method of your choice. It is very important in the second class to include lecture breaks and work hard at getting the students to be active since you are setting the tone for the rest of the semester (see Chapters 7 and 15 for a discussion of why students should be active). Toward the end of the period set aside time for student questions. Then summarize what has been covered in class. Pass out the homework and reading assignments or remind the class that the assignments are posted on the web. Remind students of your office hours and invite them to stop in and see you. If you want to be sure students know where your office is, you can require that the first homework assignment be handed in at your office. Ask anyone who missed the first class period to see you after class. Bring a few extra copies of the syllabus and other handouts for these students. Dismiss the class slightly before or at the ending time.

In general, it is useful for you to leave the classroom very slowly. Give students time to ask you questions. Many of these questions could have been asked during class. Answer them,

but encourage students to ask similar questions in class next time. Most students need a good deal of encouragement to ask questions. Some student questions pertain only to a particular student and should be handled privately.

### 3.6. THE REST OF THE SEMESTER

With the semester under way, classes develop a routine punctuated by tests and large projects. You prepare for class, develop homework assignments and tests, present lectures or use another teaching method, grade or arrange for grading of homework and tests, have office hours, and deal with any problems that may arise. Then at the end of the semester you assign course grades, post them on the secure learning management system, and run off to a meeting or vacation. This appears straightforward, but conceals many issues.

If you are lecturing, you will need to prepare each lecture before class. The way you go about this often requires a little experimentation to obtain a feel for how to proceed. Do you need to write everything out, or are just a few notes sufficient? Can you accurately reproduce equations without notes? Are your presentations clearer when you use PowerPoint, a document projector, or a whiteboard? How much material can you comfortably cover in a class period? What is a good balance between theory and examples? Students always want more examples. How closely should the lectures follow the textbook? Students will complain if you follow the textbook too closely, and they will complain if you don't! What material is important and should be emphasized? Every textbook (including this one) has both trivial material and material which is becoming obsolete. Weed this material out.

To keep students actively involved with the material, have them take notes, ask and answer questions, discuss the material, work in groups, write short summaries of the lecture, solve problems at the board or at their desks, hunt for "mistakes" made by you, and so forth. *Active learners learn better.* Encourage questions by allowing time for them, acknowledging the student by name, repeating the question so that everyone can hear it, and then answering it as appropriate. If the question will be covered later in the lecture, you can ask the student to wait.

How should homework assignments be distributed throughout the semester? How long should problems be and how many problems should there be in each assignment? Should homework problems be done solo or should you encourage group effort? Do all problems have to be turned in and graded? Should a particular format be required? How do you or a TA grade a large number of homework problems? There is no one set of correct answers for these questions, but if you want your students to spread their efforts throughout the semester, you must spread homework and quizzes throughout the semester. Students generally consider quizzes and tests the most important part of a course. What material do you test on? There should be a correspondence between course objectives and the tests. Testing for memory is easier than testing for problem-solving skills, but probably is much less important. If you want students to be able to solve problems, testing must include problem solving.

The methods used in testing must also be examined. How many quizzes and tests should you give? How much should they be worth? How many problems should be on each quiz or test? Is it acceptable to use multiple-choice questions? Students appreciate help sessions before tests. Should you have them? If so, who should lead them, and when and where? Do

you want to give partial credit? If so, how do you decide how much credit to give? Tests should be graded rapidly and as fairly as possible. In an ideal class graded tests would be returned before the students leave the classroom. In practice, returning graded tests during the next class period is considered fast. Go over the solutions when the tests are returned. Students do prepare for tests. Unfortunately, many students stop work on an area once the test is over. How do you get students to learn from their mistakes on tests? Since you will get requests for regrades, develop a regrade policy ahead of time. Do you want to give a final? Finals provoke a great deal of anxiety, but they also force students to review the entire semester and to some extent integrate the material they have learned.

How do you establish and maintain rapport with students? The best teachers have good rapport with their students even in large classes (e.g., Lowman, 1995). Students prefer professors who are enthusiastic, accessible, care about them as individuals, and are fair. Your challenge is to establish rapport while maintaining some professional distance so that evaluations of the students are fair. The goal is to develop a cooperative atmosphere where you and the students work together to maximize learning.

Office hours give students the chance to ask questions and to get additional help when they need it. Both you and the TA, if you have one, should have office hours. Some students want to talk to you solely, while others are scared to death of you. Office hours give you feedback on what the students do not understand and on what problems they cannot do. Keep your office hours or tell the students in advance when you will be out of town. Getting students to use office hours is often difficult. Continual encouragement and an open and friendly demeanor help. When students do show up for office hours, what is the best way to help them? How can you avoid spoon-feeding them and challenge them to extend themselves and do better than they think they can? What do you do to help a student who is trying but is absolutely, totally lost? Should the TA be trained in tutoring skills? Tutoring and advising are discussed in Chapter 10.

Since students forget details like office hours, before the first test remind them of your office hours and of the TA's office hours. Periodically send the students e-mails (but not everyone reads their e-mail) or text messages or tweets to remind them of office hours, homework due dates, and tests. Students will start to use office hours just before the first test or big project. Be prepared for an onslaught of students and consider how you will handle groups of students. Consider scheduling an optional help session before tests.

It is highly likely that you will slowly fall behind and material that should have been covered on Monday won't be covered until Friday. It is important to know why this happens so that the next time it won't. Write yourself notes on a copy of the course outline that explain what took extra time. Now you know what to do the next time, but what do you do now to cover all the material? If you haven't built an extra period into your course outline, the best solution is to skip some material. Do NOT speed up and try to cover all the material at a very fast pace. Look at the rest of the semester and decide what to delete. What if you get to the end of the syllabus and the semester is not over? Don't worry; this very seldom happens.

Throughout the semester you may have to deal with discipline problems. Student problems can range from the mildly annoying to the downright dangerous. The most common problems involve chronically late or absent students and passively disruptive students. If lateness bothers you, talk to chronically late students privately. They may have a legitimate

reason for being late. However, in all cases start the class on time and do not backtrack for late-comers. Point out to chronically absent students that there is a reasonably strong positive correlation between attendance in class and grades. These students are also most likely to turn in homework and projects late and to be late for or miss a test. Passively disruptive students include those who talk, sleep, play video games, wear headphones, or surf the web in class. A useful instruction for the latter is "Please close your laptops." Include detailed policies in the syllabus about all these issues. Remember that the lack of a policy or ignoring these disruptions is also a policy (see Chapter 12). Since most of the students in the course do not appreciate distractions, you can enlist them to help curb the disruptions. Early in the semester, such as after the first test, hand out 3×5 cards and ask the students to answer the following: What can the professor or TA do to help you learn? Some students will mention stopping the disruptions. When you present the results, note this and start asking the disrupters to cease their disruptive behavior.

As the semester nears the end, you will want to know how well you have done from the students' viewpoint. Ask. Many universities have very elaborate arrangements for evaluating teaching, and some department heads require faculty to have their courses evaluated. If a mechanism does not exist, you can still ask the students for comments on the strengths and weaknesses of the course. The many factors which affect students' evaluation of teaching are discussed in Chapter 16.

How do you assign grades? If you have given the students a detailed breakdown of grades, you will need to follow that procedure; however, few students will complain if the scale is made easier. Several schemes for assigning grades are discussed in Chapter 11.

Throughout the first year new professors will have many questions about teaching. Talk to other professors—many of them. Since there is no single method of good teaching, you will get varied and occasionally contradictory responses. Sort through these responses and adopt those that fit you. Talk to kindred spirits about teaching on a regular basis. If you feel comfortable taking the risk, invite another professor or a representative from the teaching improvement center into your classroom to provide feedback. Exploring teaching issues with other professors will help you to learn to teach better and more efficiently, and it will help you maintain your sanity during a very busy first year.

This outline of what a professor does to design and teach a course shows that new professors are very busy their first few semesters. These are also the semesters when you want to start your research program. What really needs to be done? How do you get everything done? The first question is discussed in Chapter 17, while the second was essentially the topic of Chapter 2.

### 3.7. THE NEW FACULTY MEMBER EXPERIENCE

Most new faculty members feel unprepared to teach (usually a realistic appraisal) and are emotionally drained by the experience. For most, learning to teach is on-the-job training (OJT), which is strongly motivating but is not the best way to learn. New faculty usually over-prepare and may spend as much as thirty-five hours per week preparing for one course (Turner and Boice, 1989). This huge time commitment can be reduced by learning how to teach before teaching the first class. Invariably, new faculty members would like more advice about teaching and handling problem students (Boice, 2000).

Turner and Boice (1989, p. 52) report on three major problems for new faculty.

1. "Adapting to the appropriate pace and level of difficulty for the students." New professors have forgotten what it is like to learn material for the first time, and they invariably go too fast and are too theoretical. The lower the level of the students, the more likely this is to occur. Since material that appears easy to you may be very difficult for students (see Chapters 14 and 15 for reasons), never tell the students the material is easy.
2. "Feeling professionally overspecialized, while not having a well-rounded knowledge of their discipline." New faculty members often teach undergraduate courses which have little in common with their PhD research. Although they may have studied the material as an undergraduate, they are rusty. In addition, a typical new engineering professor has had little or no industrial experience and is not sure what the students will use in an industrial career.
3. "Having trouble establishing an appropriate professional demeanor in their relationships with students." New professors are asked to make the transition from student to faculty essentially overnight and often are not much older than their students. They must develop a professional demeanor that will allow them to effectively teach and grade both students they like and those they don't. It takes time to learn the proper distance between oneself and students. An additional problem of many new faculty members is a fear of not knowing all the answers. It is OK to tell students that you don't know the answer to a question but that you will find out. It is also OK, and actually helps to build rapport, to admit mistakes to the class.

"Early in their careers, faculty often find the challenges of academia too great for their skill levels. This can be particularly true in areas that professors are not trained for, such as teaching and advising" (Wankat, 2002, p. 6). In addition to teaching, new faculty have to start a research program, write proposals, learn the rules of a new institution, and adjust to a new city. There is also a psychological adjustment in becoming a professor instead of being a student. Part of this adjustment is deciding what you want students to call you. Many European countries are very formal and students address professors as Professor Smith. New Zealand, on the other hand, is very informal and students will call you by your first name. The US is in between and students will call you Professor Smith or Jim depending on which one you request. If you write "Prof. Smith" on the board that will be your name, while if you write "Jim Smith" many students will call you "Jim." Discuss this issue with your mentor before the first class.

It is very useful to have a mentor who knows many of the unwritten rules (Wankat, 2002). Mentoring works best when the procedure is formalized. Some universities use team teaching of courses to help new faculty. Formal development programs also work if new professors use them (Boice, 2000; Felder et al., 2011; Menges and Associates, 1999).

### 3.8. CHAPTER COMMENTS

The most common method of designing a course and a curriculum in engineering education is to put all the fundamentals first. Once these have been covered, the course or curriculum can proceed to the practical and interesting real-life problems. This approach appears rational but ignores motivation. Most people learn best when they know why they

need to learn something. Thus, considering some practical, real-life problems early can help students significantly. This is one reason why cooperative education (alternating work and school periods) works well. This chapter discusses a real problem before you have all the information required to solve it.

Although this chapter purposely raises more questions than it answers, clearly spelling out what needs to be done for a class should be helpful to new professors, and we wanted to provide a chapter that would be immediately useful. One potential problem with enumerating tasks is that they assume a greater importance than attitudes. It is often the teacher's excitement, enthusiasm, and caring for the student which catch hold of students and fire them up for future work in the discipline. You may be able to do an adequate job as a teacher by just going through the motions, but for excellence you must do more.

Since many professors never ask themselves many of the questions asked in this chapter, one can obviously teach without understanding the process. Instead, the professor mimics former professors. Although strongly discouraged in research, mimicry or plagiarism is encouraged in teaching. Perhaps this observation helps explain why many schools value research more than teaching in their promotion policies.

If you want to read alternate approaches to preparing for your first course, try Barrett (2012), Filene (2005), Grunert O'Brien, Millis, & Cohen, (2008), Lieberg (2008), or Svinicki and McKeachie (2014).

## HOMEWORK

1. Look through the undergraduate and graduate courses offered in your department. Classify each course using the scheme in Section 3.1. If there are some courses which do not fit the classification scheme, develop new classification categories for these courses.
2. What are some sources of information to help you estimate how much material can be covered in one semester?
3. Discuss additional reasons why it is a good idea to learn the names of students.
4. Class size is an important consideration in how you teach a course. List some of the things which are affected by class size.
5. Should you use a seating chart? It seems like a high school practice, but it is almost necessary for large classes if you want to learn names. Discuss this issue. Think of alternatives.
6. Brainstorm alternative ways to start the first class. List at least five additional ways.
7. How do you decide what to cover in a course that has never been taught at your school? Brainstorm at least five methods for developing ideas.
8. Is it a bad idea to tell the class that the textbook is a poor book? Explain your answer.
9. What are the concerns in teaching a student whom you instinctively like or dislike?

## REFERENCES

- Barrett, S. F. (2012). *A little book on teaching: A beginner's guide for educators of engineering and applied science*. San Rafael, CA: Morgan & Claypool.
- Boice, R. (2000). *Advice for new faculty members: Nihil nimis*. Boston, MA: Allyn and Bacon.

- Brewer, M., & ALA Office for Information Technology Policy. (2008). Fair use evaluator. *Librarycopyright.net*. Retrieved from <http://librarycopyright.net/fairuse/>
- Carney, D. R., Cuddy, A. J. C., & Yap, A. J. (2010). Power posing: Brief nonverbal displays affect neuroendocrine levels and risk tolerance. *Psychological Science*, 21(10), 1363-1368. <http://dx.doi.org/10.1177/0956797610383437>
- Cuddy, A. (2012, June). Your body language shapes who you are. *TED Talk*. Retrieved from [http://www.ted.com/talks/amy\\_cuddy\\_your\\_body\\_language\\_shapes\\_who\\_you\\_are](http://www.ted.com/talks/amy_cuddy_your_body_language_shapes_who_you_are)
- Davis, B. G. (2009). *Tools for teaching* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Felder, R. M., Brent, R., & Prince, M. J. (2011). Engineering instructional development: Programs, best practices, and recommendations. *Journal of Engineering Education*, 100(1), 89-122. <http://dx.doi.org/10.1002/j.2168-9830.2011.tb00005.x>
- Filene, P. (2005). *The joy of teaching: A practical guide for new college instructors*. Chapel Hill: University of North Carolina Press.
- Grunert O'Brien, J., Millis, B. J., & Cohen, M. W. (2008). *The course syllabus: A learning-centered approach* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Lieberg, C. (2008). *Teaching your first college class: A practical guide for new faculty and graduate student instructors*. Sterling, VA: Stylus Publishing.
- Lowman, J. (1995). *Mastering the techniques of teaching* (2nd ed.). San Francisco: Jossey-Bass.
- Matejka, K., & Kurke, L. B. (1994). Designing a great syllabus. *College Teaching*, 42(3), 115-117.
- Menges, R. J., & Associates. (1999). *Faculty in new jobs: A guide to settling in, becoming established, and building institutional support*. San Francisco: Jossey-Bass.
- Svinicki, M. D., & McKeachie, W. J. (2014). *McKeachie's teaching tips: Strategies, research and theory for college and university teachers* (14th ed.) Belmont, CA: Wadsworth Cengage Learning.
- Turner, J. L., & Boice, R. (1989). Experiences of new faculty. *Journal of Staff, Program, & Organization Development*, 7(2), 51-57.
- Wankat, P. C. (2002). *The effective efficient professor: Teaching, scholarship and service*. Boston, MA: Allyn & Bacon.
- Wankat, P. C., & Oreovicz, F. S. (1999). Chart your course. *ASEE Prism*, 8(8), 18.