

# Center for Teaching and Learning

## Constructing Tests

Designing tests is an important part of assessing students understanding of course content and their level of competency in applying what they are learning. Whether you use low-stakes and frequent evaluations – quizzes – or high-stakes and infrequent evaluations – midterm and final – careful design will help provide more calibrated results.

- Multiple choice exams
- Essay questions
- Assessing your test

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Here are a few general guidelines to help you get start:

- **Consider your reasons for testing.** Will this quiz monitor the students' progress so that you can adjust the pace of the course? Will ongoing quizzes serve to motivate students? Will this final provide data for a grade at the end of the quarter? Will this mid-term challenge students to apply concepts learned so far? The reason(s) for giving a test will help you determine features such as length, format, level of detail required in answers, and the time frame for returning results to the students.
- **Maintain consistency** between goals for the course, methods of teaching, and the tests used to measure achievement of goals. If, for example, class time emphasizes review and recall of information, then so can the test; if class time emphasizes analysis and synthesis, then the test can also be designed to demonstrate how well students have learned these things.
- **Use testing methods that are appropriate to learning goals.** For example,

a multiple choice test might be useful for demonstrating memory and recall, for example, but it may require an essay or open-ended problem-solving for students to demonstrate more independent analysis or synthesis.

- **Help Students prepare.** Most students will assume that the test is designed to measure what is most important for them to learn in the course. You can help students prepare for the test by clarifying course goals as well as reviewing material. This will allow the test to reinforce what you most want students to learn and retain.
  - **Use consistent language** (in stating goals, in talking in class, and in writing test questions) to describe expected outcomes. If you want to use words like *explain* or *discuss*, be sure that you use them consistently and that students know what you mean when you use them.
  - **Design test items that allow students to show a range of learning.** That is, students who have not fully mastered everything in the course should still be able to demonstrate how much they have learned.
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## Multiple Choice Exams

Multiple choice questions can be difficult to write, especially if you want students to go beyond recall of information, but the exams are easier to grade than essay or short-answer exams. On the other hand, multiple choice exams provide less opportunity than essay or short-answer exams for you to determine how well the students can think about the course content or use the language of the discipline in responding to questions.

If you decide you want to test mostly recall of information or facts and you need to do so in the most efficient way, then you should consider using multiple choice tests. The following ideas may be helpful as you begin to plan for a multiple choice exam:

- Since questions can result in misleading wording and misinterpretation, try to have a colleague answer your test questions before the students do.
- Be sure that the question is clear within the stem so that students do not

have to read the various options to know what the question is asking.

- Avoid writing items that lead students to choose the right answer for the wrong reasons. For instance, avoid making the correct alternative the longest or most qualified one, or the only one that is grammatically appropriate to the stem.
  - Try to design items that tap students' overall understanding of the subject. Although you may want to include some items that only require recognition, avoid the temptation to write items that are difficult because they are taken from obscure passages (footnotes, for instance).
  - Consider a formal assessment of your multiple-choice questions with what is known as an "item analysis" of the test. For example, which questions proved to be the most difficult? Were there questions which most of the students with high grades missed? This information can help you identify areas in which students need further work, and can also help you assess the test itself: Were the questions worded clearly? Was the level of difficulty appropriate? If scores are uniformly high, for example, you may be doing everything right, or have an unusually good class. On the other hand, your test may not have measured what you intended it to.
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## Essay Questions

“Essay tests let students display their overall understanding of a topic and demonstrate their ability to think critically, organize their thoughts, and be creative and original. While essay and short-answer questions are easier to design than multiple-choice tests, they are more difficult and time-consuming to score. Moreover, essay tests can suffer from unreliable grading; that is, grades on the same response may vary from reader to reader or from time to time by the same reader. For this reason, some faculty prefer short-answer items to essay tests. On the other hand, essay tests are the best measure of students’ skills in higher-order thinking and written expression.”

(Barbara Gross Davis, *Tools for Teaching*, 1993, 272)

### **When are essay exams appropriate?**

- When you are measuring students’ ability to analyze, synthesize, or evaluate
- When you have been teaching at these levels (i.e. writing intensive courses, upper-division undergraduate seminars, graduate courses) or the content lends it self to more critical analysis as opposed to recalling information.

### **How do you design essay exams?**

- Be specific
- Use words and phrases that alert students to the kind of thinking you expect; for example, identify, compare, or critique
- Indicate with points (or time limits) the approximate amount of time students should spend on each question and the level of detail expected in their responses.
- Be aware of time; practice taking the exam yourself or ask a colleague to look at the questions.

### **How do you grade essay exams?**

- Develop criteria for appropriate responses to each essay question.
- Develop a scoring guide that tell what you are looking for in each response and how much credit you intend to give for each part of the response.

- Read **all** of the responses to question 1, then **all** of the responses to question 2, and on through the exam. This will provide a more holistic view of how the class answered the individual questions.

### **How do you help students succeed on essay exams?**

- Use study questions that ask for the same kind of thinking you expect on exams.
- During lecture or discussion emphasize examples of thinking that would be appropriate on essay exams.
- Provide practice exams or sample test questions.
- Show examples of successful exam answers.

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## **Assessing Your Test**

Regardless of the kind of exams you use, you can assess their effectiveness by asking yourself some basic questions:

- *Did I test for what I thought I was testing for?* If you wanted to know whether students could apply a concept to a new situation, but mostly asked questions determining whether they could label parts or define terms, then you tested for recall rather than application.
- *Did I test what I taught?* For example, your questions may have tested the students' understanding of surface features or procedures, while you had been lecturing on causation or relation—not so much what the names of the bones of the foot are, but how they work together when we walk.
- *Did I test for what I emphasized in class?* Make sure that you have asked most of the questions about the material you feel is the most important, especially if you have emphasized it in class. Avoid questions on obscure material that are weighted the same as questions on crucial material.
- *Is the material I tested for really what I wanted students to learn?* For example, if you wanted students to use analytical skills such as the ability to recognize patterns or draw inferences, but only used true-false questions requiring non-inferential recall, you might try writing more complex true-false or multiple-

choice questions.