

## Building a Course Resulting in a Syllabus

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Who, where, when, what, why, and how? These are the key questions one should ask themselves any time they begin the problem solving process. As a teacher, our problem is teaching our content effectively. In order to do so, we must begin by designing the instruction. This instructional design takes into consideration the who, where, when, what, why, and how to create the perfect learning environment.

First, who is it that I intend to teach? For this syllabus project, my teaching is intended for students with little or no previous Calculus experience. These students are transitioning from the secondary education they are familiar with to the new and higher expectations of post-secondary education. These students should be capable of attaining the content of the course given that they were placed in the course through either a placement assessment or successful completion of the prerequisite course requirements. Furthermore, they would most likely be fairly engaged and motivated learners as they would be advanced learners and experienced success in their previous math courses. However, their knowledge of specific Calculus concepts will be non-existent as this will be their first exposure to both derivatives and antiderivatives/integrals. Additionally, my expectation of working through the Preview of Calculus section of the text and the idea of doing some work prior to attending the first class will be new to many of these students. It will be important on that first day to hold them accountable to that by quizzing them on both the prerequisite work and the syllabus which should have all been reviewed prior to the first meeting.

Next, where and when will these students be attending this course? They could be typical college freshman attending an on campus class or advanced high school seniors who are taking this as a dual enrolled course either on campus or at their home school. The college course could be offered from a community college or four year university. The dual enrolled seniors are a little different in that their course would most likely be offered at their home school and taught, most likely, by an adjunct professor for a local community college. Math is a content area that requires frequent exposure and reinforcement in order to master and thus requires daily interaction; therefore, students would attend this class daily for approximately one hour each day Monday through Friday.

Most importantly, what is the goal for student learning and why is it important to learn? Intro to Calculus is the first exposure to the limits of functions and graphs, derivatives, and integrals/antiderivatives. These key concepts are what my students need to acquire as a result of completing this course. Students will need to perform an analysis of graphs. With the aid of technology, graphs of functions are often easy to produce. The emphasis therefore is on the interplay between the geometric and analytic information and on the use of calculus both to predict and to explain the observed local and global behavior of a function. Appropriate antiderivatives/integrals and derivatives must be able to be used in a variety of applications to model physical, biological, or economic situations. Although only a sampling of applications can be included in any specific course, students should be able to adapt their knowledge and techniques to solve other similar application problems.

Lastly, and the big question asked of any teacher, is how will this learning occur? This process begins with the preparing of the course where the learning goals, textbook, syllabus, and lesson planning occurs. Once these things are determined, the activities on the first day of class support integrated course design and shows the students what I'm like and what I expect. McKeachie tells us that students come to the first day wanting to know what the course is all about and what kind of person the teacher is. These first day activities also set the stage for achieving the course objectives, which in integrated course design is the first thing the instructor considers in designing the course. These activities that break the ice and encourage student involvement, you are modeling to the students how the learning process will look and what the expectation will be. For Intro to Calculus, the course objectives will be obtained through assignments, a learning log, and assessments. The reading from Bain, chapter three, quickly touches on the fact that most professors focus on what the teacher does more so than what the students are to learn. With the course objectives in hand I was able to ask myself: (1) What should students be able to do as a result of learning? (2) What can I do to help them? (3) How can the teacher and students best understand their process and quality of learning? And (4) How can the teacher evaluate their efforts in fostering the learning? Using these questions, I was able to take the specific content topics and the applications that students should be able to do upon completing the course and determine what specific problems would best support this learning. As for the process and quality of learning, the learning log will reinforce the students' learning and help them focus on the learning process through the course. It will also help them to be self-aware of what the foci are when approaching and exiting any particular topic within the

content. To evaluate my efforts in fostering the learning of students, I will closely monitor their performance on course assessments and alter my methods accordingly.

There are the key questions one should ask themselves any time they begin the problem solving process. As a teacher, my largest problems are determining what my students should be able to do as a result of learning, what I can do to help them, how can we best understand their process and quality of learning, and how can I evaluate my efforts in fostering their learning. In order to answer these questions, we must begin by designing the instruction. This instructional design takes into consideration the who, where, when, what, why, and how to create the perfect learning environment.