• Prerequisite courses are designed to provide students with the knowledge necessary to begin an advanced-level course
The Problem

Have you had the experience of entering the classroom on the first day of the semester to teach a course that had prerequisites, yet found that students entering your course were only partially prepared and yet the knowledge base of each student seemed different than that of the next student?
Implicit Assumptions

• There is a body of knowledge that is necessary for the advanced course (we call this core knowledge or core content)
• The core knowledge is taught in the prerequisite course
• Students who pass the prerequisite course have acquired the core knowledge
How good are these assumptions?

• If the mean grade in the prerequisite course is a B, then, presumably, the students know 85% of the core knowledge.

• Is that a good assumption?

• And if it is, do all of the students know the same 85%? (for convenience we refer to the phenomenon of students learning different material as differential learning)
Differential Learning with 3 Students

- Student A’s Knowledge
- Student B’s Knowledge
- Core Content Common to all 3 Students
- Student C’s Knowledge
Possible Responses to Differential Learning

• Teach the advanced course as if all students know the core material, but this will leave some students behind
• Review (re-teach) the core material, but this will reduce the time available for the core content of the new course

• Is there a better way?
Assumptions of Uniform Prerequisite Learning

- There is an identifiable core content
- Students can master the core content
- Mastery of the core content is necessary for successful completion of the advanced course
- More than simply the core content is covered in the prerequisite course
The Uniform Prerequisite Learning Concept

• All students who pass the prerequisite course know ALL (or virtually all) of the core content
Uniform Prerequisite Learning

Core Content (C-Level or Passing-Level)

B-Level Content

A-Level Content
Uniform Prerequisite Learning

- All students must take the C-Level exam.
- Those who pass the C-Level exam with a score of 95% or higher have earned a C (passing grade) in the course and the right to take the B-Level exam.
- Those students who pass the B-Level exam with a score of 95% or higher have earned a B in the course and the right to take the A-Level exam.
Uniform Prerequisite Learning

- Those students who pass the A-Level exam with a score of 95% or higher have earned an A in the course.
Uniform Prerequisite Learning

- Core Content (C-Level or Passing-Level)
- B-Level Content
- A-Level Content
Small-scale Trial (PSU)

• 5 students in Introduction to Operations Management (a quantitative course)
• Students were allowed to attempt examinations as often as they desired
• Most took exams infrequently, allowing time for study between takes
Results

• Adequate grade distribution was obtained

• Students self-selected not to continue taking exams after achieving a satisfactory (as defined by the individual students) level
Results

• Students reported they were:
  – Required to learn material at a deeper level than traditional courses
  – Confident they would be successful applying the techniques in the future, even a substantial amount of time had passed
  – Interested in taking other courses following this format