

MTED 3890: Math Pedagogy Seminar
Undergraduate Pedagogy Seminar for Linear Algebra
1 credit hour

Why Should You Take this Course?

Have you ever been curious about why your professor makes certain teaching decisions? Have you ever been interested in how people think about and learn mathematics? Are you interested in participating in discussions that could support you in doing better in linear algebra? This course will investigate some of the decisions that are made while teaching linear algebra. One possible benefit is the research link found between reflecting on learning and increased academic success.

Description

This pedagogy seminar accompanies MATH 2600: Linear Algebra and will examine the process of teaching and learning of that course content. Students enrolled in Professor Mark Ellingham's linear algebra section may elect to participate in this accompanying one credit pedagogy seminar. This optional seminar will be team-taught by your linear algebra instructor, Mark Ellingham, and a math education faculty member, Teresa Dunleavy,.

Corequisite: A student may not register for this pedagogy seminar unless that student also registers for MATH 2600: Linear Algebra, section 3.

Rationale

The pedagogy seminar constitutes an exploration of a single question: how does the successful teacher transform subject-matter expertise into a form that students can comprehend? This ability, which has recently been characterized as "pedagogical content knowledge," is central to the educational process. A teacher's competence in subject matter is useful when that teacher can:

- 1) assess student interest and understanding;
- 2) anticipate student difficulties and/or misconceptions;
- 3) construct coherent explanations; and
- 4) organize course content clearly and from multiple perspectives.

The pedagogy seminar is structured to provide opportunities for students to think about linear algebra from a teacher's perspective, that is, to integrate content and method for teaching.

The purpose of the pedagogy seminar is to identify and analyze the teaching techniques employed by the primary course instructor and to encourage students to reflect on the process of their own learning. Therefore, the focus of the seminar is the primary course content as it is taught and learned, rather than generic principles of pedagogy. In essence, the primary course to which the seminar is attached becomes a "case study" in pedagogical content knowledge, and the instructional team leads the seminar participants through the case. In the process, students not only analyze the teaching techniques employed by the primary course instructor, but also construct and create alternatives for teaching the same material to other audiences.

Required Text

There is no text required for the seminar since the linear algebra course functions as a "text." However, there will be short, assigned readings throughout the course. Other media resources may also be used.

Evaluation

Because of the nature of the seminar, student attendance at, and active participation in, seminar sessions is critical and therefore will weigh heavily in evaluation of student performance.

Attendance (20%)

Attendance is expected. Only official university excuses will be accepted for absences.

Class participation (30%)

Class participation is expected. Class participation is defined as asking thoughtful and pertinent questions, commenting on, clarifying and bringing into focus points of interest related to course content and readings, and generating novel concepts, examples, and techniques for teaching the primary course material. Instructors will feature students' blog posts as one basis for class discussion. (See below.)

Weekly Blog (30%)

Each week, students will write short, 100-300 word blog posts related to a teaching and learning issue of interest. Students will rotate responsibilities for starting and replying to blog post entries. The instructors will initially determine the weekly focus; as the course continues, students may be encouraged to initiate a particular focus for the week. Foci may include, but are not limited to: syllabus construction, textbook use, homework, and classroom learning structures.

Additional assignment (20%)

Students in the pedagogy seminar will be required to complete a final assignment. We will encourage you to select and/or create an assignment related to your interests. Examples may include:

Reaction paper (3-5 pages): a critical analysis of one lesson/lecture in which the student
a) identifies the behavioral objective of that lesson; b) states what was accomplished in the lesson; c) states the effective teaching methods or techniques used in that lesson; d) identifies the examples and analogies used by the instructor in teaching the lesson; e) identifies additional teaching techniques/methods which could have been effectively used; and f) evaluates the degree to which the objective for that lesson was met.

Brief lesson presentation of some aspect of course material "transformed" for a designated audience, combined with a "rationale and assessment" paper discussing the planning and the outcome of the lesson presentation (approximately 3 pages).

Investigate a pedagogical issue that is relevant to teaching linear algebra and write a 3-5 page paper that describes the issue and incorporates current research.

***Please be aware that this course is new and experimental.
We will make our best efforts to follow this syllabus, but if something is not working
assessment methods may be modified to better meet the needs of the class.***