

**Tennessee Technological University  
Mathematics Department**

**MATH 4991: Mathematical Research**

**I. COURSE DESCRIPTION FROM CATALOG:**

This course introduces students to the process of performing research. By reading papers the students will learn how to define open and significant problems, set up a research plan and, if applicable, define relevant experiments. Students will be required to give presentations on either their own or other people's research. Cr. 1

**II. PREREQUISITE(S):**

C or better in MATH 1920 and consent of instructor.

**III. COURSE OBJECTIVE(S):**

To introduce students to research at an early stage of their careers. Students will learn to appreciate and respect the challenges of research which might guide them in their later decisions regarding their own careers.

**IV. TOPICS TO BE COVERED:**

- History of the chosen topic: When did the first paper appear, who has been or is currently working on this topic? Where can the resources be found?
- Read and discuss introductory research papers on the topic.
- Identify and study required background knowledge.
- If applicable: Learn (or refresh the knowledge on) a programming language.
- Design and implementation of a webpage that informs about the research project.
- If applicable: Learn to use an existing software package.
- Learn Latex to document results and write reports.
- Learn tools for visualization of results (e.g. MATLAB for graphs, postscript, xfig, etc.)
- If applicable: Define, implement, perform, and document numerical test problems and interpret the results.
- Read more advanced papers on the topic and give presentations to the other students.
- Identify open problems and try to find solution strategies.
- Write a report (either a survey on the topic or on the results of performed research; may be a team report on a group project).

**V. ADDITIONAL INFORMATION:**

Graduate credit is earned on the basis of additional work required by the instructor per TTU Graduate Catalog.

**VI. POSSIBLE TEXTS AND REFERENCES:**

Research papers.

**VII. ANY TECHNOLOGY THAT MAY BE USED:**

Students with a disability requiring accommodations should contact the Office of Disability Services (ODS). 1  
An Accommodation Request (AR) should be completed as soon as possible, preferably by the end of the first week of the course. The ODS is located in the Roaden University Center, Room 112; phone 372-6119.