Instructor: Dr. Kathleen Feigl
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Lectures: MWF 16:05–16:55, 327B Fisher Hall
Office Hours: MWF 13:00–14:00, or by appointment

Prerequisites: Differential Equations and Multivariable Calculus; Knowledge of a programming language (e.g., Fortran, C++) or computing software (e.g., Matlab, Mathematica); or consent of instructor.


Contents: The course addresses fundamental concepts, implementations and applications of the finite element method. Topics include:

- Boundary value problems
- Variational methods
- Finite element methodology
- Polynomial interpolation
- Numerical integration
- Solving systems of discrete equations (linear and nonlinear)
- Convergence and error analysis
- Linear and nonlinear differential equations
- Time-dependent problems
- Applications in heat transfer, solid and structural mechanics, and fluid mechanics

Homework: Homework, including computer projects, will be assigned and graded (40% of grade).

Final Exam: There will be a midterm exam (30% of grade) and a final exam (30% of grade).

Class Policies:

- Attendance in class is expected. If you are unable to attend a class due to illness or personal loss, contact the instructor as soon as possible.
- Students are expected to hand in homework assignments and computer projects on time.
- Only for a valid reason and with a note from the Dean of Students will a make-up exam be allowed.

Affirmative Action Notice: “MTU complies with all federal and state laws and regulations regarding discrimination, including the ADA Act of 1990. If you have a disability and a need, a reasonable accommodation for equal access to education or services can be made through the Dean of Students Office (Gloria Melton 487-2212). For concerns regarding discrimination of any kind, pleases contact your advisor, department head, or affirmative action office.”