Nondestructive Evaluation (NDE) Minor

Nondestructive evaluation (NDE) utilizes a number of techniques to determine the health of an engineering component or structure without affecting its usefulness. Much like a doctor may use ultrasound or radiography to assess the health of the body, engineers use these and other techniques to decide if material properties are within an acceptable range, if a component was well manufactured, or if damage has occurred in service that would warrant retirement. NDE professionals are active in all phases of engineering, from design to manufacturing to in-service use, and in all industry sectors including aviation, power generation, transportation, manufacturing, and many others.

How can undergraduates get involved in NDE?

The **NDE Minor** at Iowa State University is a unique opportunity to get a multi-disciplinary qualification in the rapidly evolving engineering discipline of Nondestructive Evaluation. There are also several summer internship opportunities accessible by students taking the NDE minor. Below is the current list of required and approved courses for the minor, for which 16 credits are required. Courses other than the two required courses can be selected from those listed below according to your interests; you can take courses in various NDE disciplines and at the same time qualify for this important minor.

**Required Courses**

- MatE/EM 362 Principles of Nondestructive Testing (Cr. 3. S.)
- MatE/EM 362L Nondestructive Testing Laboratory (Cr. 1. S.)

**NDE Specific Courses (2 needed for 6 or 7 credits)**

- MSE / EM 550 Fundamentals of NDE (Cr. 4. S.)
- EM / AerE / MatE 490 + other departments Independent Study (Cr. 3. F.S.S.S.)
- EM 350 Introduction to NDE Engineering (Cr. 3. S.)
- MatE/EE 488 Eddy Current NDE (Cr. 3. F.)

**Supporting courses (2 needed for 6 or 7 credits)**

- AerE 321 Flight Structures Analysis and Laboratory (Cr. 3. F.)
- AerE 421 Advanced Flight Structures (Cr. 3. S.)
- AerE 423 Composite Flight Structures (Cr. 3.)
- Stat 231 Probability and Statistical Inference for Engineers (Cr. 4. F.S.)
- Stat 305 Engineering statistics (Cr. 3. F.S.S.S.)
- Stat/EE 322 Probabilistic Methods for Electrical Engineers (Cr. 3. F.S.)
- AerE 422 Aeroelasticity (Cr. 3. Alt. F.)
- AerE 426 Design of Aerospace Structures (Cr. 3.)
- EE 424 Introduction to Digital Signal Processing (Cr. 4.)
- EM 424 Intermediate Mechanics of Materials (Cr. 3. F.S.)
- EM 425 Introduction to the Finite Element Method (Cr. 3. S.)
- ME 417 Advanced Machine Design I (Cr. 3. S.)
- ME 418 Mechanical Considerations in Robotics (Cr. 3. S.)
- MatE 418 Mechanical Behavior of Materials (Cr. 3. S.)
- MatE 443 Physical Metallurgy of Ferrous Alloys (Cr. 3. F.)
- MatE 444 Corrosion and Failure Analysis (Cr. 3. S.)

For more information including mentor opportunities for 490 projects, contact [ndeminor@iastate.edu](mailto:ndeminor@iastate.edu) or Bruce Thompson, Nicola Bowler or Lisa Brasche