

## **EL507 Intro to Finite Element Analysis (FEA) Online Course**

### **Module 1**

- Introduction
  - Overview of FEA, without mathematic examples
  - Definitions
  - Development of equations

### **Module 2**

- Details of the method
  - A complete, start-to-finish, FEA,
    - An example, which demonstrates the steps of the method
  - Derivation of the elemental equations

### **Module 3**

- Introduction to Abaqus - a practical, hands-on experience performing FEA:
  - A basic tutorial on the use of the commercially-available software
  - Students will work the example of the "details" module, and other tutorials for various analysis types

### **Module 4**

- More advanced topics in element generation
  - Introduction to concepts underlying the creation of "elements" which are used to make the approximation desired.
    - This module covers the nuts and bolts of the method, which lie in element generation
  - Shear locking
  - Element interpolation

### **Module 5**

- Additional Abaqus capabilities
  - Use of the finite element software for more advanced structural, thermal analyses, and basic modal analysis



## Module 6

- Practical advice for competent FEA-
  - Description of various items of the method to improve an analyst's competence
  - Tips on how to model various boundary conditions and reduce error
  - Discussion of various other FEA capabilities not covered in other modules
  - Known pitfalls