

FINITE ELEMENT ANALYSIS CERTIFICATE

Program Description

When challenges arise in design, it is crucial for engineers and their teams to have the right awareness and skill set to solve complex problems like an expert. Using finite element analysis (FEA), you can predict how a part or assembly will behave under given conditions, setting you up to innovate computationally.

In this certificate program, you will build your conceptual understanding of finite element-based simulations. As you do, you will gain hands-on experience, from solving simple structural problems using Ansys Mechanical to solving practical problems that involve elasticity and plasticity with realistic geometries and loads. You will also solve applied problems using methods such as beam and shell analysis as well as modal and random vibration analysis. By the end of this certificate program, you will have the foundational skills to build reliable and valid FEA simulations for practical problem solving in your career ahead.

You'll be most successful in this program if you have a basic knowledge of differential and integral calculus and Newton's second law as well as some prior exposure to statistics.

We strongly recommend you use a desktop version of Ansys. If you don't already have access to Ansys, be sure your machine meets the following hardware requirements in order to download and use the free student desktop version of Ansys:

- Supported platforms and operating systems: Microsoft Windows 10, 64-bit
- Minimum hardware requirements: Workstation class processor, 4 GB RAM, 25 GB hard drive space, Computer must have a physical C:/" drive present, professional workstation class 3-D graphics card and driver, OpenGL-capable.

If your machine does not meet these requirements, you may also use an online version of Ansys. Be sure you meet the following bandwidth requirements: 5Mbps download speed and 100 ms maximum roundtrip latency.

For the best experience in this program it is strongly recommended to take these courses in the order that they appear.

Key Takeaways

- Build your conceptual understanding of finite element-based simulations
- Solve a simple structural problem using Ansys Mechanical
- Solve practical problems that involve elasticity and plasticity with realistic geometries and loads
- Solve practical problems such as wind turbine blade buckling using beam and shell analysis
- Solve practical vibration problems (turbine blade and disk, beam, aviation electronics) using modal and random vibration analysis

What You'll Earn

- Finite Element Analysis Certificate from Cornell Engineering
- 70 Professional Development Hours (7 CEUs)

Who Should Enroll

- Mechanical engineers
- Simulation engineers
- Civil engineers
- Aerospace engineers
- Prospective engineers
- Biomedical engineers
- Design engineers
- Undergraduate and graduate students in engineering

Total Investment

3 months to complete the courses.

How to Enroll

For more information and to enroll, please visit Finite Element Analysis Certificate (<https://ecornell.cornell.edu/certificates/engineering/finite-element-analysis/>).

Courses

Code	Title	Hours
eCornell MAE141	Conceptual Foundations of Finite Element Analysis	0
eCornell MAE142	Ansys Mechanical Concepts and Implementation	0
eCornell MAE143	Elasticity Applications	0
eCornell MAE144	Beam and Shell Applications	0
eCornell MAE145	Vibration Applications	0