Ansys

CASE STUDY /

Ansys + Rutgers University

"Engineering simulation skills are becoming increasingly important for mechanical and aerospace engineering students as they enter their career. To meet these industry demands, Rutgers requires a course for all mechanical and aerospace engineering students that gives them the skills to approach completely new problems while providing simulation experience and training. Many students have found this course particularly rewarding and have highlighted it as a standout compared to other courses in the curriculum."

Jonathan Singer
Associate Professor / Rutgers University

CASE STUDY

Rutgers University Creates Scalable Multiphysics Simulations Course with Ansys Student

Founded in 1908 with a sole focus in mechanical engineering, Rutgers University's Mechanical and Aerospace Engineering Department currently educates more than 700 undergraduates across both fields and simulation skills are needed now more than ever. To equip students best, especially those approaching graduation, Rutgers launched a Multiphysics Simulations course for juniors and seniors in 2017 and made it a requirement for all department majors in 2019. The requirement caused a spike in class size, which saw an increase from 13 students in the fall of 2017 to over 100 students by the fall of 2020. To effectively scale the course for its new demands, Jonathan Singer, an associate professor in the Mechanical and Aerospace Engineering department, redesigned the course using an innovative approach, which required minimal resources and incorporated Ansys Student software.

Challenges

As the need to equip graduates with simulation skills increased, and time and resources remained limited, Rutgers University's Mechanical and Aerospace Engineering department needed a solution that fit into students' schedules and required minimal supplies. As curriculum demands prevented the addition of multiple simulation-based courses, and with only 60 computers with one teaching assistant available onsite, the department needed to redesign its existing simulation course.

Ansys Products Used

Ansys Student

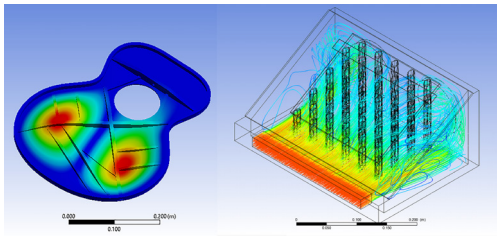
Engineering Solution

The objective of the Multiphysics Simulations course is to empower students to think like real-world engineers, support their senior capstone projects, and equip them with simulation experience to approach new challenges by providing basic skills in Ansys and other commercial software.

To achieve this most effectively with limited time and resources, the course is now conducted with weekly lectures provided online so class time consists of 50% discussion and 50% tutorials. By alternating between discussion and tutorial sessions, classes are easier to manage, and students gain more hands-on learning. To further address resource constraints, students access Ansys Student at home, or anywhere off campus, for free.

Benefits

- By using Ansys Student, students practice and learn simulation for free without the time restrictions of using a computer lab on campus.
- Applying simulation experience gained throughout the course, students complete final projects, learning and connecting what they can model and simulate in actual scenarios. This is invaluable problem-solving experience for graduates launching their engineering careers.
- Many students highlight the course as a standout in the curriculum.
- Ansys Student includes versions of signature products like Ansys Mechanical and Ansys Fluent providing students with exposure to popular programs.



Student project results from the Multiphysics Simulations course at Rutgers University show modal analysis of a custom guitar body in left image and convection cooling analysis of a heat sink in right image.

Associate Professor Jonathan Singer in a Rutgers University engineering lab.

University/Company Description

Jonathan Singer is an associate professor at Rutgers University in the School of Engineering. He is the developer of the Multiphysics Simulations course at Rutgers that is taken by over 100 students.

Singer is an accomplished teacher and mentor recognized by the Rutgers students and faculty through a 2019 Engineering Governing Council Students' Professor of the Year award in the Mechanical and Aerospace Engineering department and the 2020 Provost's Award for Excellence in Innovative Teaching.

Rutgers University's Mechanical and Aerospace Engineering department uses Ansys Student to implement a scalable multiphysics simulations course into the curriculum.

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