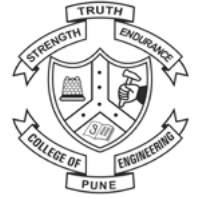


Indian Engineering Institute CoEP Establishes CAE Optimization Center Employing Altair HyperWorks



Overview

This success story illustrates how a reputed engineering institute of national acclaim has set-up a CAE - Optimization Lab, equipped with Altair HyperWorks CAE tools, to expose their students to the latest technologies in product design, analysis, and optimization. Within the range of the CAE - Optimization Lab, CoEP has launched various courses to impart knowledge on Altair HyperWorks. This CoEP initiative bridges the gap between industry expectations and needs and the knowledge that graduating students possess. Being trained on advanced and contemporary technologies such as the HyperWorks suite has opened new opportunities for students to embark their career, has improved the national ranking of the college due to investing in a modern and robust infrastructure, and also has benefitted the industry by creating a talent pool of well-trained manpower, available to work on breakthrough engineering initiatives.

CoEP has set an example in education that is in pace with engineering innovation through technology, industry expectations, and new evolving career opportunities for students.

Customer Profile

The College of Engineering, Pune (CoEP), chartered in 1854, is a nationally respected leader in technical education. The institute distinguishes itself from other institutes through its commitment to find solutions for the great predicaments of today through advanced technology. The institute has a rich history and is dedicated to the pursuit of excellence. The hallmark of CoEP education is its strong and widespread alumni network, support of the industry, and the close partnerships the institute has with several foreign universities.

The institute is consistently ranked amongst the top 15 technical colleges in India and its alumni have contributed a lion's share in development of national infrastructure.

For more information about CoEP please visit: <http://www.coep.org.in/>.

Challenge

CoEP was amongst the first institutes in India to realize the fast changing pace of engineering innovation that calls for a corresponding change in education to play a significant role in providing knowledge and the needed skill-set possessed by its graduating students.

The CoEP leaders knew that education should be consistent with the contemporary knowledge and the state-of-the-art technology used in the industry.

To further improve the college's ranking, to provide a basis for the students' future career opportunities, and to strengthen collaborations with industry, the CoEP had to establish an environment where teachers and students alike are able to leverage state-of-the-art engineering technologies to cover contemporary requirements in the market. With this objective the CoEP founded the CAE-Optimization Lab and had then to decide which tools would cover the needs of the center best, while leading to a self-sustaining operation of the lab.



CAE - Optimization Center at the College of Engineering, Pune.

"The results technology gives are only as good as the person operating the system. Technology is thus limited to the knowledge and experience of the person working on it and with this COEP project we set-out to break the boundaries of both: gain proficiency on technology and create new knowledge."

Dr. Anil Sahasrabudhe, Director, CoEP

"The CAE-Optimization Center of Excellence empowers students to work on complex analysis projects, enables researchers to conduct detailed and thorough studies, and offers working professionals a platform to upgrade their knowledge on advanced technologies such as CAE software through specialised courses. It also helps professors and students to use the facility to the full extent for their research work and publishing their projects in national and international forums. All in all CoEP-Altair Center of Excellence equips and inspires students, professionals, researchers, industry and faculties alike to pursue higher level product design analysis and optimization work to create designs that perform and achieve excellence."

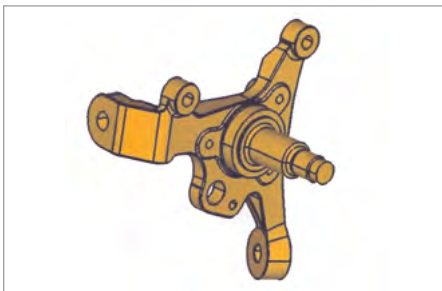
Dr. V. K. Tripathi, Coordinator, CoEP-Altair Center of Excellence for CAE Optimization

Solution

In 2011 CoEP and Altair Engineering in association with DesignTech Systems established the “Center of Excellence for CAE- Optimization” to carry out research work for thesis papers and PhDs, that provide consultancy and product design optimization as well as analysis services to R&D departments of companies in the areas product design and engineering. The additional objective of the “Center of Excellence for CAE- Optimization” was to offer trainings to working professionals, under graduate and post graduate engineering students. The idea was to capitalize on the infrastructure of the “Center of Excellence for CAE- Optimization” that uses latest technologies from Altair in product design, optimization, and analysis including HyperMesh, RADIOSS, OptiStruct, and HyperStudy. The center was to be self-sustaining and meant to not only educate students on these cutting edge technologies, but also assist the industry, to be able to conduct their product design optimization work at a reasonable financial investment. Last but not least the center also aimed at aiding research students and aspirants of PhDs to be able to make the most of this facility to complete their papers and research work.

With this goal, Dr. V. K. Tripathi, coordinator for and spokesperson of the Center of Excellence at CoEP, has introduced many different HyperWorks courses for students and working professionals, interested to learn more about product design optimization and in gaining a proficiency on Altair’s software, especially its specialized software on design optimization OptiStruct and solidThinking Inspire. Design optimization, including hands-on lab sessions, is now also part of the syllabus for graduate and post graduate students.

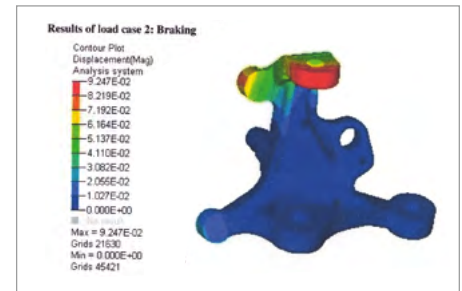
One of the main reasons why the CoEP has decided to work with Altair was Altair’s dedicated tool for structural analysis, OptiStruct. OptiStruct is a state-of-the-art software in the industry, easy to use and an excellent tool for shape and size analysis and optimization. In addition, the HyperWorks tools have an open architecture and its pre- and post-processing tools (i.e. HyperStudy) can be linked with any other solver to produce the desired result. All the Altair tools can be used for academic as well as for research projects, which makes Altair HyperWorks the perfect solution for theoretical and systematic optimization.



CAD model of a vehicle steering knuckle.



Load case combination of steering, braking, and bumping.



Contour plot of displacement results for braking load case.

Results and Benefits

The CoEP and Altair Center of Excellence has equipped and geared students, faculties and researchers alike to work on innovative ideas. It allowed and encouraged them to experiment with new concepts, conduct complex analysis that inspired students to showcase their talents in several contests of national and international repute. Assistant researchers could conduct conclusive and result oriented research-work to be published in reputed journals and present at national and international forums.

The creation of the “Center of Excellence” at the CoEP has helped to:

- significantly increase project quality submitted by the students
- better company placements
- set up the basis for better collaboration with the industry
- generate revenue through additional evening training programs, which help to run a self-sustaining model of Center of Excellence
- develop interest among students about technologies for product design optimization.

While earlier students feared the complex mathematical calculations that might be involved in topology and topography Optimization, the students trained on OptiStruct now have the confidence to use this cutting-edge tool and are able to generate best results. OptiStruct handles all calculations in the background, and it even takes manufacturability aspects into consideration. It then suggests the ideal product design that can withstand occurring forces and loads within the defined boundary conditions. While doing so, it also suggests ideal mass distribution by throwing up a design option that can, not just save raw material but can help build product that is lighter than before and yet stronger. This enables students to apply optimization in their university work as well as in their future career, helping to create better, lighter and stiffer products.