



/ Getting Started with

Ansys Education Resources

FOR EDUCATORS



Supporting educators who inspire today's students to become tomorrow's engineers, researchers and entrepreneurs.

This document is intended for educators teaching with Ansys products.

Here you will find a brief overview about our Education Resources and what curriculum support is offered across a wide range of disciplines.

Version 1, 2022

Our vision

Ansys Education Resources are designed to complement inquiry-based learning methods. Inquiry based learning is a form of active learning in which educators create structured real-world problem-solving scenarios, to promote critical, scientific, and higher order thinking skills among students.

We understand that it can be challenging to constantly think of new and engaging real-world problem-solving scenarios. So, to support this community, we have created hundreds of realistic resources covering a vast range of engineering topics. Delivered in a form that can be easily integrated into your teaching, you will find exercises, cases studies, technical papers, lecture presentations, infographics, and posters. Many can be incorporated into a learning management system or be used as standalone files.

Educators may modify the technical contents of our resources to fit their own teaching styles or use the resources intact, the choice resides with educators. Students may also use some of our resources to interpret and analyze real world data, ask questions, make observations, and conduct research.

We hope that by using Ansys Education Resources, educators can foster deep engagement in students, while enabling opportunities for collaborative learning, flipped classrooms and other innovative teaching, and learning methods.



Ansys **Education Resources**

Explore the full library of teaching resources designed with educators in mind.

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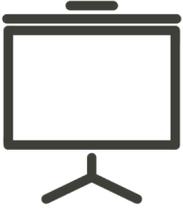
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Ansys Education Resources: by type



Lecture Presentation: A collection of themed presentations, including 25 units dedicated to teaching materials selection. Educators can use slides directly within their classes or taken as inspiration to supplement existing content.



Technical Paper: From 'Teach yourself Crystallography' to 'Architecture and the Built Environment', these technical documents bring a deeper level of understanding to a range of topics. Some can be used to support self-guided learning, while others provide background theory for Ansys product developments.



Case Study: Using real-world examples, fundamental concepts are brought to life through an engaging topic such as a Mars Lander Heat Shield and Longboard design. Depending on the level of knowledge, educators can choose between a range of introductory and advanced formats.



Exercises: Sometimes the best way to learn is by doing *i.e.* solving problems and answering questions using our software. These resources have been created to support a broad range of teaching styles, be that in-class activities or as independent homework. Resources that contain answers, will be limited to license holders.



Infographic: Popular material-property charts and subject-matter topics are freely available in these engaging infographics. Use them simply in lecture slides or, like the Department of Materials Science & Metallurgy at the University of Cambridge, get creative and paste them as wallpaper!



Teaching Package: A collection of related teaching resources, housed in one easily downloadable zip file. For example, educators interested in the 'Introductory Materials Science & Engineering' package, will discover lecture slides, exercises, quiz questions, MicroProjects and concept maps.



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Restricted Resources

The vast majority of our resources are open for anyone to use but there are some, like project files and exercise solutions, where we need to restrict access to licensed educators.

To retrieve these resources, educators can simply request access by filling out a Request Now form which can be found on all relevant pages.

Once approved, educators will then receive ZIP files, containing all restricted resources.

/ Request Now

[Browse restricted resources >](#)



Referencing our resources

Ansys Education Resources have been created for student instruction, student projects and student demonstrations. Any commercial use is strictly prohibited.

Academic users may make fair use of screenshots from our resources and/or products in their teaching. Students can use them for educational purposes. This includes but is not limited to capstone project reports, conference posters, educational guides, video demonstrations, webpages, social media channel postings. You must include the following acknowledgment on all materials containing Ansys screenshots: "Images used courtesy of ANSYS, Inc."

When writing a conference paper, white paper, journal article, thesis, presentation, book or web page, you may also need to reference Ansys, its resources or its products. In all cases, authors should work to ensure that the reference is specific and clear and that any interested reader will be able to easily find the referenced information.

For example: *Ansys® Education Resources, Exercises: Material Selection; Translation, Screening, Ranking, 2022, ANSYS, Inc.*

For more information about referencing Ansys please take a look at our [Terms and Conditions](#).



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Aerospace

Aerospace engineering is centered around the design of aircraft and spacecraft. All these applications are expected to function at peak performance in extreme environments. Therefore, it is important for aerospace engineering students to grasp how fundamental concepts, taught in the classroom, impact the design choices made on the job. Our teaching resources support the incorporation of complex problem solving skills within a real-world context.

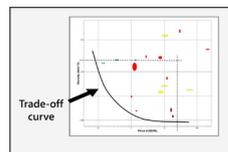
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To find these resources, simply copy and paste the titles into the online search functionality, or use the suggested keywords shown at the bottom of this page.



Level 3 Industrial Case Study:
Mars Lander Heat Shield



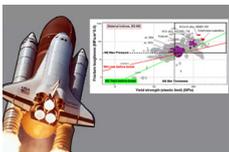
Lecture Unit 8:
Objectives in conflict



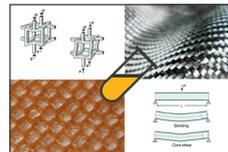
Level 3 Industrial Case Study:
Aerospace and Automotive Turbine Blades



Lecture Unit:
The Aerospace edition



Level 3 Industrial Case Study:
Aerospace Pressure Vessels



**The Synthesizer Tool Model
Writer's Guide**

Suggested keywords...



- Aerospace
- Superalloys
- Composites
- Lightweighting
- Turbine
- Pressure vessel
- Heat shield



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Bioengineering

Combining the principles and problem-solving skills from unusually disparate disciplines, bioengineering requires students to grasp new knowledge and understanding of living systems through the application of experimental and analytical techniques of engineering sciences. To support this growing field, the bioengineering teaching resources pull on real-life examples through which fundamentals can be taught. This includes a classic case study on total hip replacements, as well as more recent inspiration in the fast manufacture of a COVID face visor.

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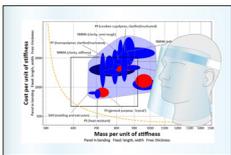
To find these resources, simply copy and paste the titles into the online search functionality, or use the suggested keywords shown at the bottom of this page.



Level 3 Industrial Case Study:
Biomaterials Selection for a Joint Replacement



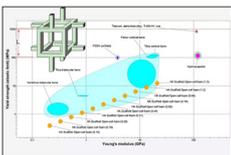
Teaching Package:
Medical Devices



Level 3 Industrial Case Study:
Fast mass-production of medical safety shields



Exercises:
Bioengineering



Level 3 Industrial Case Study:
Porous Scaffolds for Bone Tissue Engineering



Lecture Notes:
Biomedical Waste-Health vs. Environment

Suggested keywords...



- Bioengineering
- Biomedical
- Medical devices
- Implant
- Health
- Bone
- Biomaterials



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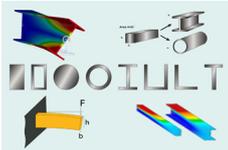
Built Environment

Engineers within the built environment not only create and transform places for communities and businesses to thrive, but they are also increasingly responsible for designing sustainable homes for the future of our planet. Combining core knowledge from materials, engineering, and architecture, built environment engineers must also consider a cultural element. These resources have been created to support educators teaching in this demanding field.

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To find these resources, simply copy and paste the titles into the online search functionality, or use the suggested keywords shown at the bottom of this page.



Level 3 Industrial Case Study:
Material Properties and
Structural Sections



Lecture Unit:
Structural Sections



Level 2 Industrial Case Study:
The Built Environment



Paper:
Architecture and the Built
Environment



Lecture Unit:
Architecture and the built
environment



Case Study Teaching Package:
The Built Environment-
Materials and Sustainability of
Buildings

Suggested keywords...



- Built Environment
- Buildings
- Architecture
- Structures
- Facades

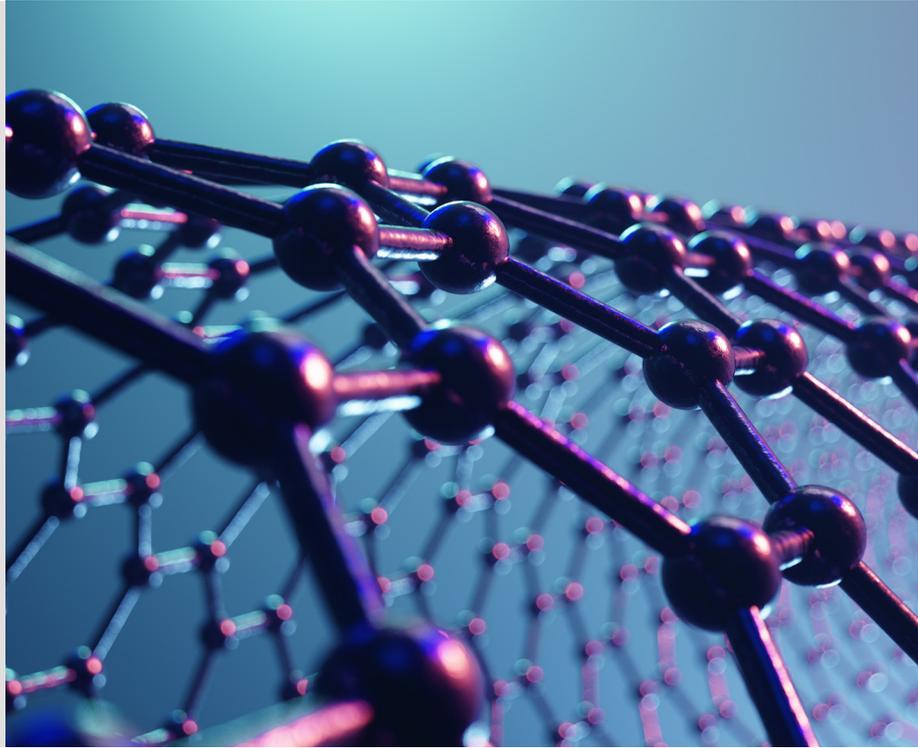


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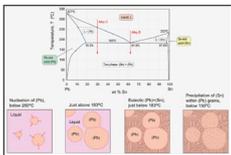
Materials Science

Materials science and engineering (MS&E) focuses on understanding materials at all length scales, from atomic interactions and bonds to macroscopic performance in extreme environments. For students in this field, it can be challenging to learn about material behaviors, especially when many occur at length scales that cannot be seen with the naked eye. Our materials science teaching resources look to connect fundamental theories with real-world applications and examples, bridging the new information with concepts familiar to learners.

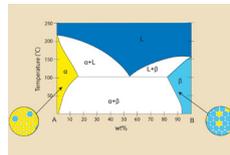
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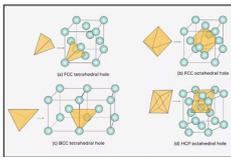
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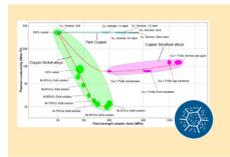
Booklet:
Teach Yourself Crystallography



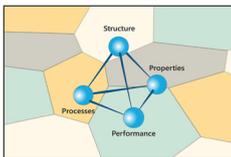
Introductory MSE Teaching Package: Phase Diagrams



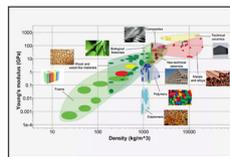
Booklet:
Teach Yourself Phase Diagrams



Technical Paper:
Process Property Profiles



Exercises:
Materials Science and Engineering



Technical Paper: Supporting Introductory Materials Science Teaching for All Majors: Callister-Based Courses and Granta EduPack

Suggested keywords...



- Materials Science
- Crystallography
- Phase Diagrams
- Properties
- Structure
- Callister

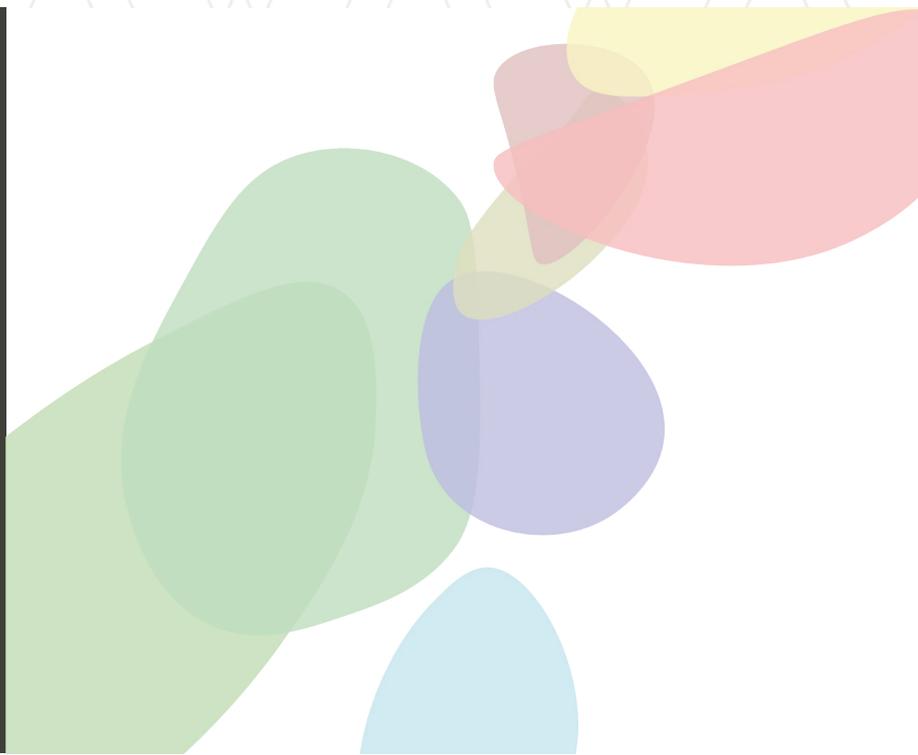


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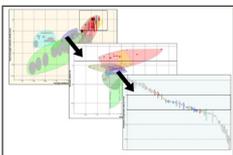
Material Selection

During the design process, selecting the best material for the job is a critical step. But, with thousands of engineering materials to choose from, many engineering and design students can find this process overwhelming. Ansys Granta EduPack, originally created by Prof. Mike Ashby, was specifically designed to help students explore the Selection Methodology and understand the importance of materials choice in a product's design. These teaching resources focus on the Ashby Selection Methodology, aiding its incorporation into the curriculum, regardless of discipline.

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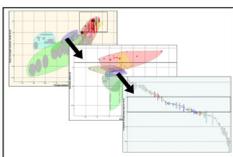
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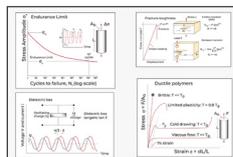
Lecture Unit 7:
Material Selection



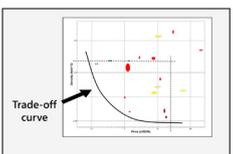
Paper:
Teaching Materials and Processes to First and Second Year Students



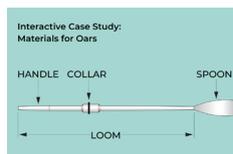
Exercises:
Material Selection; Translation, Screening, Ranking



Booklet:
Material Property definitions-a summary



Lecture Unit 8:
Objectives in conflict



Interactive Case Studies:
Materials for Oars

Suggested keywords...



- Materials selection
- Ashby
- Charts
- Objectives
- Constraints
- Design
- Performance Index



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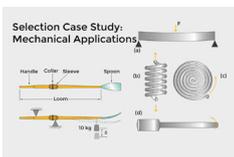
Mechanical Engineering

Mechanical engineering focuses on the design, construction, and use of machines. These machines are integral to our day-to-day lives. Students in this field must learn the fundamental concepts of materials, manufacturing, and design, and be able to apply that knowledge during project work and on the job. Our teaching resources help bridge the gap between theory and practice with real-world examples focused on concepts such as structural integrity, material behavior during service, and the connection between materials and processing capabilities.

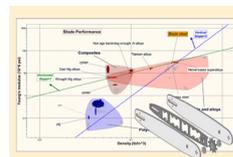
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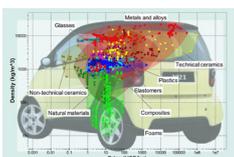
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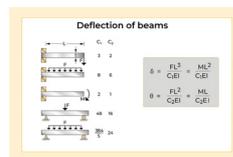
Selection Case Study:
Mechanical Applications



Case Study Teaching Package:
Chainsaw



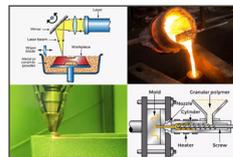
Level 3 Industrial Case Study:
Automotive Door Panel



Booklet:
Useful Approximate Solutions
for standard problems



Selection Case Study:
Thermo-Mechanical
Applications



Lecture Unit 10:
Manufacturing processes and
cost modeling

Suggested keywords...



- Mechanical
- Intro to materials
- Manufacturing
- Composites
- Processes
- Modeling



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/ More inspiration?

Our education products and resources are designed to empower educators to give students the best hands-on experience possible. If you want more inspiration, why not check out what else we have to offer?



/ Further support

At Ansys we have a team specially dedicated to ensuring your teaching is supported by our products and resources. Have a specific question about the material? Want to share your teaching experiences?

Contact us: education@ansys.com



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