

# "Ship the Chip"



## Student Resource: Manufacturing Engineering and Packaging

### • What do manufacturing engineers do?

Manufacturing engineers often work in teams and with many other disciplines as well. They often coordinate their work with mechanical, material and industrial engineers, as well as many other fields too. They will frequently meet with other engineers and others outside engineering to review the manufacturing process, goals, and current status. Manufacturing engineers may be involved in workforce planning and use, work flow, and the design and space planning for the manufacturing process. They may be involved in product planning, providing input into original product design -- with an eye to what will be required to ultimately manufacture the product. Their expertise in production efficiency is helpful in product design, and packaging planning. Graduates with an accredited degree in engineering management may also be involved in packaging engineering. They work in most industries, particularly on larger projects or programs which require overarching organization and planning to ensure success. Engineering management students take courses such as accounting, finance, marketing, operations management, general management, strategic management, management of technology, industrial and quality engineering, and manufacturing and packaging engineering.

### • Packaging Options

Engineers often work with marketing, sales, and perhaps a creative department when recommending packaging requirement for a product. Good packaging must protect the product, eliminate any damage while moving, shipping, or storing the products, and also make the product attractive if it is to be displayed in a consumer environment such as a grocery store, hardware store, or department store. For this reason, packaging is a critical part of a product's design and engineering process, and engineers must take many factors into consideration including appearance, function, and costs.

### • Material Selection

Engineers have to consider the durability, cost, and performance of different materials when designing products and the package they will ship or be displayed in. Many factors will help determine which materials to use, such as how long the package will be on the product, how fragile or expensive the product is, and whether exposure to temperature or humidity would impact the performance of the product.





# Ship the Chip



- **Engineering Teamwork and Planning**

You are a team of engineers given the challenge of designing the smallest, lightest package of all the engineering teams in your class that will protect a single PRINGLE potato chip shipped to CSUN from your location.

- **Planning and Design Phase**

Each team should think about package strength, size, and weight as you design your package. You might want to consider how well your package will survive if it finds itself at the bottom of a stack of heavy boxes during shipping! There are also several rules you must follow, which your teacher will review with you so your package is not disqualified.

- **Construction Phase**

Build your package, by addressing the questions below:

1. How similar was your design to the actual package you built.
2. If you found you needed to make changes during the construction phase, describe why you made revisions.
3. Will your design endure the typical transportation abuse while in shipping?
4. Will your main objective of the end-user receiving an intact chip be achieved?
5. How confident your team is about the design's success?

- **Shipping Phase: ship your project to:**

**Professor Gus H. Elias**  
**CSUN / CECS-MSEM**  
**18111 Nordhoff Street**  
**Northridge CA, 91330-8332**





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## Student Worksheet: Project Evaluation

Evaluation Phase --- Once all packages have arrived at CSUN, they will be evaluated in reference to the following parameter:

- **Presentation & packaging.**
  - **Innovative design and quality testing.**
  - **Effort measured for man hours.**
  - **Documentation and cost analysis.**
  - **Making a short video clip about brainstorming & testing.**
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- **Reflection & Analysis**
    1. What aspect of the design of the package that had the best overall score do you think lead to its success?
    2. If you had a chance to do this project again, what would your team have done differently?

- **Presentation**

As a group, make a well-prepared & well-practiced presentation to the class about the entire process and what you learned during this activity.

Be creative .... Be energetic ..... Be innovative .... Be motivated.

**All the best!!!**