Packaging Systems and Design

packaging.sbio.vt.edu

For students interested in materials and applications...

A packaging system is comprised of a series of components including materials, structure, processing, design, marketing, and even compliances. Among those, selection of the right packaging material is one of the most important criteria to packaging professionals.

There are five major packaging materials: plastics, paper and paperboard, corrugated, glass, and metal. Plastic polymers like PET, PE, PP, and PS provide fundamental properties, such as barrier and containment properties, for numerous packaged consumer products. For example, if you go to Wal-Mart, you will see millions of products on shelves. There are no products without packaging. You will see plastic or paper-based materials everywhere playing critical roles as container- or bag-like structures. We call these either rigid packaging or flexible packaging. Sometimes, plastics are engineered with other packaging materials as a part of an individual functional layer because plastics are basically resistant to water and oils. This property is crucial for manufacturers to secure long-term safety and shelf-life of their products.

Fiber-based materials such as paper, paperboard, and corrugated are the most common materials in packaging. These are natural polymers derived from wood or other biomasses. These are often chosen for secondary and tertiary packaging systems such as corrugated shipping boxes due to cost efficiency and higher rigidity compared to the other packaging materials.

As the lifestyles of customers change to modern city life, the new trend of e-commerce packaging is getting more attention. E-commerce packaging systems are more oriented for convenience and functionality. E-commerce packaging brings in advanced technologies such as multilayer structures or composite systems with other packaging materials such as plastic/paper/aluminum combinations for canned products or items that come in pouches.

In the Virginia Tech packaging program, we are offering a series of courses focused on packaging materials and their applications. SBIO 3214 Paper and Paperboard Packaging introduces the basic principle of paper production, its properties and types, functional structures and designs, and even its applications for customers and manufacturers. SBIO 3284 Packaging Polymers and Production is one of the core courses for packaging students who are seeking careers as packaging polymer engineers and material specialists. Students will learn about the key plastic polymers that are commonly used in packaging systems. SBIO 3284 is very similar to chemical engineering courses. Packaging students also learn how to design the right packaging systems for millions of applications in SBIO 4214 Food and Health Care Packaging. The food and health care industries are the largest industries in the world and include food, cosmetics, and even medical products.

After completing these courses, our students are prepared for broad areas of the business sector such as Coca-Cola, Pepsi, Nestle, L'Oréal, breweries, and even pharmaceutical and chemical companies. They also can work for plastic or paper packaging manufacturers. We call these industries as converters. Although these types of jobs are not well-known to the public because they do business with brand owners directly, the annual revenues of these companies are in the billions of dollars. Currently, numerous VT packaging alumni are working in these areas as packaging engineers and are earning very competitive salaries compared to other industries

Starting salaries range from $60-$120K based on a recent alumni survey.

COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
SUSTAINABLE BIOMATERIALS
VIRGINIA TECH

E-commerce packaging systems are oriented for convenience and functionality, and bring in advanced technologies.

Transfer Credits:
The Packaging Systems and Design degree offers a lot of flexibility to transfer students to tailor their education and also to allow them to graduate on time. Our **32 free elective credits allow you to transfer classes that you already took** and count it towards your graduation progress. This allows many students to graduate on time even after changing their major.

Example courses:

- SBIO 3284 – Packaging Polymers and Productions
- SBIO 4214 – Food and Health Care Packaging
- SBIO 3214 – Paper and Paperboard Packaging

To learn more about the PSD degree:

packaging.sbio.vt.edu packaging@vt.edu

Meet with our professional advisor to learn about the degree requirement and transfer credits.

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