**Food Packaging**

PKG3103 Section 3351

***Class Periods:*** MWF Period 5, 11:45am-12:35pm

***Location:*** ROG 283

***Academic Term:*** Fall 2025

***Instructor:***

Bruce Welt, Professor

bwelt@ufl.edu

352-294-6730

Office Hours: MWF 12:36-1:36PM or by appointment

Please note: This course will be taught in the classroom with occasional synchronous and asynchronous online elements as required for scheduling. Class attendance, in person, is required.

***Course Description***

(3 Credits) Study of major technical, safety issues involved in modern food packaging practices. Physical and chemical properties of food packaging materials. Survey of modern packaging techniques for various food types.

***Course Pre-Requisites / Co-Requisites***

CHM 2045 or approval by instructor

***Course Objectives***

After successfully completing this course, the student will be able to:

1. Analyze requirements for food packaging regarding safety and shelf life.
2. Integrate knowledge of food composition, material properties, food processing, supply chains, regulations, and sustainability into strategies for successfully packaging foods.
3. Specify requirement for designing packaging for foods.

***Materials and Supply Fees***

None

***Relation to Program Outcomes (ABET):***

The table below is an example. Please consult with your department’s ABET coordinator when filling this out.

|  |  |
| --- | --- |
| **Outcome** | **Coverage\*** |
| 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics | High |
| 1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors | Medium |
| 1. An ability to communicate effectively with a range of audiences |  |
| 1. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts |  |
| 1. An ability to function effectively on a team whose members together provide leadership, create a collaborative environment, establish goals, plan tasks, and meet objectives |  |
| 1. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions | Medium |
| 1. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies |  |

\*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

***Required Textbooks and Software***

None

***Recommended Materials***

* Food Packaging – Principles and Practices (2nd Edition), by Gordon Robertson, 2006 (ISBN 0849337755)

***Course Schedule (subject to change)***

Week 1: Introduction

Week 2: Ready-to-drink milk packaging (PET and HDPE)

Week 3: Food packaging polymer chemistry and properties

Week 4: Permeability - Oxygen Transmission Rate (OTR)

Week 5: Packaging sustainability (scorecard to circular economy concepts)

**(Exam 1) Estimated week Oct 6**

Week 6: Permeability - Water Vapor Transmission Rate (WVTR)

Week 7: Modified Atmosphere Packaging (MAP) – Fresh Produce

Week 8: Metal Packaging, Canning, Double Seam & Double Seam Inspection

Week 9: Corrosion of Metal Packaging

**(Exam 2) Estimated week Nov 3**

Week 10: Aseptic and thermal processing and packaging of foods

Week 11: Thermal processing (kinetics) and packaging of foods

Week 12: Packaging related migration (mass transfer), measurement, modeling, regulations

Week 13: Paper based packaging

Week 14: Critical analysis of packaged foods

**(Exam 3) Estimated week Dec 1**

(Final Exam) Optional (if you like your grade before final, you can keep it)

***Attendance Policy, Class Expectations, and Make-Up Policy***

Attendance is required and monitored by sign-in sheet. Each unexcused absence may be charged a grade point. Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and may require appropriate documentation.

***Evaluation of Grades***

|  |  |  |
| --- | --- | --- |
| **Assignment** | **Total Points** | **Percentage of Final Grade** |
| Homework (~10) | 10 | 15% |
| Exams (3 & Final) | 500 | 85% |

***Grading Policy***

|  |  |  |
| --- | --- | --- |
| **Percent** | **Grade** | **Grade Points** |
| 93.4 - 100 | A | 4.00 |
| 90.0 - 93.3 | A- | 3.67 |
| 86.7 - 89.9 | B+ | 3.33 |
| 83.4 - 86.6 | B | 3.00 |
| 80.0 - 83.3 | B- | 2.67 |
| 76.7 - 79.9 | C+ | 2.33 |
| 73.4 - 76.6 | C | 2.00 |
| 70.0 - 73.3 | C- | 1.67 |
| 66.7 - 69.9 | D+ | 1.33 |
| 63.4 - 66.6 | D | 1.00 |
| 60.0 - 63.3 | D- | 0.67 |
| 0 - 59.9 | E | 0.00 |

***Academic Policies & Resources***

To support consistent and accessible communication of university-wide student resources, instructors must include this link to academic policies and campus resources: <https://go.ufl.edu/syllabuspolicies>. Instructor-specific guidelines for courses must accommodate these policies.

***Commitment to a Positive Learning Environment***

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University’s core values.

If you feel like your performance in class is being impacted, please contact your instructor or any of the following:

• Your academic advisor or Undergraduate Coordinator

• HWCOE Human Resources, 352-392-0904, [student-support-hr@eng.ufl.edu](mailto:student-support-hr@eng.ufl.edu)

• Pam Dickrell, Associate Dean of Student Affairs, 352-392-2177, [pld@ufl.edu](mailto:pld@ufl.edu)