101 Principles of Packaging
Fall, Spring, Summer. 3(3-0) SA: PKG 210
Packaging systems, materials and forms and their rela-
tionship to the needs and wants of society.

102 Introductory Packaging Seminar
Fall, Spring. 2(2-0) P: PKG 101 or concur-
rently R: Open to undergraduate students in the
Packaging Major.
Packaging career choices in science, management and
engineering. Creativity in packaging designs and
career decisions.

221 Packaging with Glass and Metal
Fall, Spring. 2(2-0) P: (CEM 141 or CEM 151
or LB 171) and (PHY 231 or PHY 231C or
PHY 183 or PHY 183B or LB 273) and (PKG
102 or concurrently) R: Open to sophomores
or juniors or seniors in the Packaging Major.
SA: PKG 320, PKG 325
Physical and chemical properties of glass and metals
and their applications to packaging.

315 Packaging Decision Systems
Fall, Spring. 3(2-0) P: (MTH 132 or MTH
152H or LB 118) and (PKG 221 or concur-
rently) R: Open to sophomores or juniors or seniors
in the School of Packaging. SA: PKG 415
Communication, analysis, and problem solving in the
management, specification, production, sustainabil-
ity, economics and testing of packaging.

322 Packaging with Paper and Paperboard
Fall, Spring. 4(3-2) P: (PKG 221 or concur-
rently) and PKG 101) and (MTH 133 or MTH
152H or LB 119) and (CEM 143 or CEM 251
or CEM 351) and (STT 200 or STT 201 or
STT 315 or STT 351) R: Open to sopho-
more or juniors or seniors or graduate stu-
dents in the School of Packaging. SA: PKG
325
Physical and chemical properties, manufacture, con-
version, and use of wood, paper, paperboard, and re-
lated components in packaging. Design, use, and
evaluation of packages.

323 Packaging with Plastics
Fall, Spring. 4(3-2) P: (PKG 221 or concur-
rently) and PKG 101) and (MTH 133 or MTH
152H or LB 119) and (STT 200 or STT 201 or
STT 315 or STT 351) and (CEM 143 or CEM
251 or CEM 351) R: Open to sopho-
more or juniors or seniors or graduate stu-
dents in the School of Packaging. SA: PKG
320
Physical and chemical properties of plastics and their
relationship to selection, design, manufacture, perfor-
manence, and evaluation of packages.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>485</td>
<td>Packaging Development</td>
<td>Fall, Spring. 3(3-0) P: (PKG 410 and PKG 432) and (PKG 315 or EGR 102) and (PKG 411 or concurrently) R: Open to seniors or graduate students in the School of Packaging. Approval of department; application required.</td>
<td>1 to 3</td>
<td>R: Approval of department. SA: PKG 802</td>
</tr>
<tr>
<td>486</td>
<td>Packaging Senior Capstone (W)</td>
<td>Fall, Spring. 3(3-0) P: (PKG 485) and completion of Tier I writing requirement R: Open to undergraduate students in the Packaging Major. Development of a team-based packaging design project serving specific product and market needs. In depth team report of feasibility, specifications, sourcing, marketing, value-chain economics, and sustainability.</td>
<td>1</td>
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<tr>
<td>490</td>
<td>Directed Studies in Packaging Problems</td>
<td>Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>1 to 3</td>
<td>R: Open to undergraduate students in the Packaging Major. Approval of department; application required. Development of solutions to specific packaging problems. Supervised individual study.</td>
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<tr>
<td>491</td>
<td>Special Topics</td>
<td>Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>1 to 4</td>
<td></td>
</tr>
<tr>
<td>492</td>
<td>Senior Seminar</td>
<td>Spring. 1(2-0) R: Open to seniors in the Packaging major. Seminar on current packaging issues, business organization and operations, and accepted practices in a corporate environment.</td>
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<td></td>
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<tr>
<td>493</td>
<td>Professional Internship in Packaging</td>
<td>Fall, Spring, Summer. 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>3</td>
<td></td>
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<tr>
<td>499</td>
<td>Undergraduate Research</td>
<td>Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.</td>
<td>1 to 3</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>Packaging Materials</td>
<td>Fall. 4(4-0) R: Approval of department. Physical and chemical properties of packaging materials; design, manufacture, performance and evaluation of packages.</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>803</td>
<td>Packaging Distribution and Dynamics</td>
<td>Spring. 2(2-0) R: Approval of department. SA: PKG 802</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>804</td>
<td>Packaging Processes</td>
<td>Spring. 2(2-0) R: Approval of department. SA: PKG 802 Integrated study of packaging and production operations, quality control, organization and control of machines. Interrelationship of products, packaging, machinery layout and efficiency, and quality issues.</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>805</td>
<td>Advanced Packaging Dynamics</td>
<td>Spring. 3(2-2) RB: PKG 410 Shock and vibration. Distribution hazards and product fragility. Cushion performance and package design. Environmental measurement and simulation.</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>814</td>
<td>Packaging for Food Safety</td>
<td>Summer. 3 credits. Interdepartmental with Veterinary Medicine. Administered by Veterinary Medicine. RB: Enrollment in graduate program in related field. R: Open to master's students in the Food Safety major and open to graduate students in the Packaging major or approval of college. Current issues in packaging and food safety.</td>
<td>3</td>
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<tr>
<td>815</td>
<td>Permeability and Shelf Life</td>
<td>Spring. 3(2-2) RB: MTH 124Q and MTH 132 (2 credits). Relationship between the storage life of packaged food and pharmaceutical products and the gas, moisture, and organic vapor permeability of packages in various environments.</td>
<td>3</td>
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<td>817</td>
<td>Instruments for Analysis of Packaging Materials</td>
<td>Fall of even years. 4(3-2) RB: PKG 322 and PKG 323 Analytical methods for packaging including spectroscopy and chromatography. Material identification and characterization. Migration and permeation measurements.</td>
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<tr>
<td>825</td>
<td>Polymeric Packaging Materials</td>
<td>Fall. 4(3-2) RB: Graduate students with chemistry, physics, and mathematics backgrounds. SA: PKG 827 Physical, mechanical and chemical properties of packaging polymers and multilayer structures; relationship between properties and performance of packaging materials and systems; processing of packaging plastics.</td>
<td>4</td>
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<tr>
<td>840</td>
<td>Anti-Counterfeit Strategy and Product Protection</td>
<td>Summer. 3(3-0) Interdepartmental with Criminal Justice and Veterinary Medicine. Administered by Veterinary Medicine. R: Open to graduate students in the School of Criminal Justice or in the School of Packaging or in the Food Safety major or approval of department. Theory and applied techniques for anti-counterfeit strategies and product protection for food and consumer products.</td>
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<tr>
<td>850</td>
<td>Packaging Value Chain</td>
<td>Fall. 3(3-0) Packaging value chain from raw material supplier to retailers in context of meeting current needs. Global exploration of value chain strategies to increase innovation, sustainability, cost savings, quality, organizational agility, responsiveness.</td>
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<td>860</td>
<td>Research Methods</td>
<td>Fall. 3(3-0) RB: General statistics. Principles and expectations for responsible conduct of research in packaging. Integrity of the research process, critical thinking, scientific methods, proposal writing, and scientific communications.</td>
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<tr>
<td>875</td>
<td>Stability and Recyclability of Packaging Materials</td>
<td>Fall of odd years. 3(3-2) RB: PKG 322 and PKG 323 Interactions between packaging materials and environments: corrosion, degradation, stabilization, and recycling. Impacts of packaging disposal.</td>
<td>3</td>
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<tr>
<td>880</td>
<td>Life Cycle Assessment: Background, Principles, Calculations, and Applications</td>
<td>Spring of even years. 3(2-2) RB: Graduate students with chemistry, physics and mathematics backgrounds. Determination of the environmental footprint of products, packaging and systems during their entire life cycle using life cycle assessment (LCA) methodology. Introduction to the theory and application of LCA.</td>
<td>3</td>
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<tr>
<td>888</td>
<td>Master's Project</td>
<td>Fall, Spring, Summer. 2 credits. R: Open only to master's students in the School of Packaging. Approval of school, application required. Master's degree Plan B project. Completion of a project related to packaging issues.</td>
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<tr>
<td>890</td>
<td>Independent Study in Packaging</td>
<td>Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to graduate students in the School of Packaging. Approval of department; application required.</td>
<td>1 to 3</td>
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<tr>
<td>891</td>
<td>Selected Topics</td>
<td>Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in the School of Packaging.</td>
<td>1 to 4</td>
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<tr>
<td>899</td>
<td>Master's Thesis Research</td>
<td>Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to master's students in the Packaging major. Master's thesis research.</td>
<td>1 to 8</td>
<td></td>
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</tbody>
</table>
Analytical Solutions to Packaging Design
Spring of even years. 3(3-0) RB: PKG 801 R: Open only to graduate students in the College of Agriculture and Natural Resources or College of Engineering or College of Natural Science. Approval of department; application required.
Analytical and quantitative techniques for packaging design and evaluation.

Independent Study in Packaging
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to Ph.D. students in the School of Packaging. Approval of department; application required.
Special investigations of unique packaging problems.

Packaging Seminar
Fall. 1(2-0) A student may earn a maximum of 3 credits in all enrollments for this course. R: Open only to graduate students in the School of Packaging.
Presentations of detailed studies on specialized aspects of packaging.

Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open to doctoral students in the School of Packaging.
Doctoral dissertation research.