Experimental Food Science & Technology

Contact Information
Kylee Scholar, MS RD CLE
Email: kscholar@mail.sdsu.edu
Office Hours: by appointment

Course Materials
Required Materials:
- White Lab Coat
- Proof of Payment of Lab Fee (submit receipt from cashier’s office by 2/6/2015)

Optional Texts:

Purpose of the Course
NUTR 405 provides the analytical skills to complete the food science series. Students use their knowledge of food anatomy, food preparation/processing (NUTR 205) and theories of food chemistry (N401) to develop and evaluate food products. Lab experiments are designed to measure food product attributes using standardized methods to prepare students for small group research studies that require testing, reliable data collection, critical interpretation, and valid application of research findings. This course provides critical knowledge and skills for students interested in the development, analysis, marketing or manufacturing of food.

Course Description
This course will cover two major subjects: Food and Nutrient Analysis and Food Product Development. In the first half of the course, students are introduced to common methods of analysis. The properties of food components and testing applications are discussed as related to the tests used. Emphasis is placed on the basic principles involved in the analytical procedure. The next phase of the course will allow student groups to marry creativity with food science to develop a food product prototype. Food ingredients and formulations will be marketed for a specific group and need. Development will include nutrient analysis, labeling, and evaluation and standardization of product attributes. This part of the course will include the application of principles and methods of commercial sensory evaluation of their food product. Students will conduct discriminative and preference testing using panelists. Students will also employ objective methods of food evaluation related to sensory properties of foods. Data analysis and interpretation will be completed on all sensory tests. Students will determine the marketability of the prototype product. This course is designed to draw upon and expand by application material from the Food Science areas of chemistry, nutrition, microbiology, statistics, and engineering. Throughout the course, ingredient variations; group project studies; data interpretation and report writing and group project presentations will be emphasized.

School of ENS learning goals and objectives
Learning Goal 1. Demonstrate core critical thinking skills and dispositions to ask and answer questions relevant to exercise and nutritional science

Objective 1.1: Critically evaluate published research in the discipline
Objective 1.2: Evaluate alternative solutions to a discipline-based problem.
Objective 1.4: Critically evaluate current trends and practices using disciplinary knowledge.
Objective 1.5: Actively seek out discipline-based questions as opportunities to apply core critical thinking skills.

Learning Goal 2: Demonstrate effective oral, written, and other interpersonal skills to help communicate knowledge and promote health and wellbeing in diverse communities.

Objective 2.1: Use effective technical writing skills to communicate information about exercise and nutritional science.
Objective 2.2: Use effective oral presentation skills to present information to peers and other professionals.

Learning Goal 3. Demonstrate understanding of scientific concepts, principles, and methods used in the study of exercise and nutritional science

Objective 3.2: Identify the steps in the scientific method of research.
Objective 3.5: Design a research study and collect, analyze, and evaluate findings in relation to a proposed hypothesis.

Learning Goal 4. Use an array of technologies to support inquiry and professional practice

Objective 4.1: Use the internet and e-mail to communicate with others and find valid information.
Objective 4.2: Use various technology instrumentations to measure phenomena of interest.
Objective 4.3: Use software programs appropriate to discipline to organize, analyze and interpret findings.
Objective 4.4: Use presentation software to report project findings.

Learning Goal 5. Demonstrate ethical decision-making, cultural competency, and civic responsibility when applying knowledge of exercise and nutritional science.

Objective 5.4: Participate in a student/professional organization or community service activity related to exercise and nutritional science.

Learning Goal 7. Use the principles of assessment to evaluate a variety of measurement tools in exercise and nutritional science.

Objective 7.3: Evaluate the responsiveness, sensitivity, and specificity of measurement devices used in exercise and nutritional science.
Objective 7.4: Collect data to examine the reliability or objectivity of common measurement tools in exercise and nutritional science.
Objective 7.6: Describe ways to implement a measure or test to increase its reliability.

Learning Goal 8. Demonstrate the ability to integrate and apply knowledge and skills through experiential learning opportunities.

Objective 8.2: Administer assessments in a variety of special populations, including children/adolescents, young adults, and older adults.

2012 ACEND Standards Core Knowledge for the RD
KRD 1.1 The curriculum must reflect the scientific basis of the dietetics profession and must include research methodology, interpretation of research literature and integration of research principles into evidence-based practice.

KRD 2.1 The curriculum must include opportunities to develop a variety of communication skills sufficient for entry into pre-professional practice.

KRD 4.3 The curriculum must include the fundamentals of public policy, including the legislative and regulatory basis of dietetics practice.

KRD 5.1 The food and food systems foundation of the dietetics profession must be evident in the curriculum. Course content must include the principles of food science and food systems, techniques of food preparation and application to the development, modification and evaluation of recipes, menus and food products acceptable to diverse groups.

Assessment and Grading:

**Project I: Reliability of Lab Resources**
Student groups will develop a protocol for one analytical method and perform several trials of data collection and analysis to determine if the assigned lab equipment is reliable in measuring the gross composition of Whole Wheat Flour. Results and interpretations of the data will be presented along with a demonstration to familiarize students with the operation and reliability of PSFA 416 lab instruments.

**Project II: Food Science Applications**
Student groups will design a study protocol and collect data for three other student groups’ protocols over several lab periods. Graded work will include the protocol and one JFS formatted manuscript per group. Each investigation employs a different method/apparatus and has a clear problem that illustrates the various applications of food science.

**Project III: Product Development**
Student teams will formulate a new, creative food product. Teams will pilot test and standardize the product, evaluate the product attributes and composition, develop a product label, conduct market tests to determine the degree of consumer acceptance for the product, and develop a preliminary strategy for packaging and distribution. The purpose of the product should be justified, marketable and supported by the results of the analysis. Research findings will be presented orally and in a full proposal.

**Cumulative Exam**
There will be ONE exam worth 50 points. The exam will include True/False, essay and short answer questions. The exam will require you to define terms, explain and operate equipment features and functions, explain basic concepts, read graphs, and demonstrate your expertise in data analysis and interpretation. Exams will not be returned to you, but you will be able to see your exam and review it. Be prepared by bringing a calculator and an 882 ES (green) scantron to the exam.

**Participation**
Students will evaluate the performance of each of their group members for projects I-III. Thus for the majority of course work, student participation will be based on peer assessments. However, the instructor has the right to deduct up to 20 points from final score for reasons including, absence during required meetings, late lab fee receipts and/or required documents, carelessness in maintaining clean and safe work spaces, and not following instructions (especially for grocery orders).

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Points</th>
<th>Designed to assess ENS Student Learning Outcome</th>
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<tbody>
<tr>
<td>Project I</td>
<td>50</td>
<td>1.1, 2.2, 4.2-4.4, 7.3-7.5</td>
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Course Policies:

Attendance
1. You are expected to attend all required laboratory meetings. If your absence is unavoidable for any reason, you remain responsible for obtaining the information missed.
2. Since you will be working within groups throughout the course, you must be on time to all student group meetings and activities. Your attendance and punctuality with your group will be reflected in your peer evaluations and in any anonymous conversation your group member(s) have with me regarding any group issues or problems.

Assignment Submission
3. The projects are due at start of the scheduled lab hour on the day that is assigned. Failure to do so will result in a ten percent (10%) penalty per day per assignment for each group member. Late assignments will not be accepted for credit after the third (3rd) day following any assignments original due date. Assignments will be considered late if submitted past the start of the scheduled class hour and will not be accepted via email.
4. Project must be typewritten in twelve-point, black font and double-spaced unless otherwise specified. Please no binders or plastic covers. Failure to attach a grading rubric to the back of the document and a cover page that includes students’ names in alphabetical order by last name, lab section, semester and date to the front will result in an automatic 5 point penalty.

Adding the course
5. Add codes may be given to students meeting the pre-requisite for whom course is required in order of total number of units earned at or transferred to SDSU.
   1st: Graduating ENS majors, for whom the course is required, conditionally classified ENS graduate students, and international students.
   2nd: ENS majors for whom the course is required for the major and in order of total number of units completed in the major.
   3rd: Undergraduate non-majors seeking a specialization or minor for whom the course is required and in order of total number of units earned at or transferred to SDSU.
   4th: Any other students the instructor wishes to add in order of total number of units earned at or transferred to SDSU

Students with Disabilities
6. If you have a documented disability and anticipate needing accommodations in this course, be certain that you work with the Disabled Student Services Office to secure appropriate documentation. Course accommodations will not be applied retroactively (e.g., after an examination). Student must request from the instructor that the exams be sent to the DSS Test Office at least three (3) days prior to the exam date documented. Exams must be returned to ENS Office and dropped in GA (or instructor) file.

Plagiarism (General Catalog, page 449)

7. “Work shall be deemed plagiarism: (1) when prior work of another has been demonstrated as the accessible source; (2) when substantial or material parts of the source have been literally or evasively appropriated; and (3) when the work lacks sufficient or unequivocal citation so as to indicate or imply that the work was neither a copy nor an imitation. In short, if one purports to present an original piece but copies ideas word for word or by paraphrase, those ideas should be duly noted.”

“All work submitted in this course must be your own and produced exclusively for this course. The use of sources (ideas, quotations, and paraphrases) must be properly acknowledged and documented. If in doubt, you are encouraged to review guidelines for the proper use of sources (e.g., http://www.hamilton.edu/academics/resource/wc/usingsources.html), as well as the University guidelines (including definition and policy) regarding cheating and plagiarism http://its.sdsu.edu/resources/turnitin/pdf/Plagiarism_AcadSen.pdf

Permitted Reference Materials

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