

FOS 4310L
Experimental Food Laboratory
1 credit
Spring Semester 2017

Instructor: Xixuan(Zoey) Tang, M.S., Teaching Laboratory Specialist

Contact Information: Food Science and Human Nutrition Department
Room 333A, FSHN Building, Newell Drive
Phone: 352.294.3729
Email: tangxx1991@ufl.edu

Office hours : Wednesday 10:00 am – 12:00 pm or by appointment

Teaching Assistants : L'Oshiaa Reed, sisterinlaw358@ufl.edu; Shaomin Zhao, meggie257@ufl.edu

Course Prerequisites/

Co-requisites: Food Chemistry (FOS 4311)

Course Description: This course is designed to demonstrate and illustrate the chemical and physical properties of foods. The course shows the effects of processing, ingredients, and storage on food quality and nutrient retention. Students will prepare and evaluate different food products (breads, cakes, pretzels, jelly, meats, fruits, vegetables, etc.) using various chemical, instrumental and sensory analysis techniques. The focus is on applied food development for dietetic students.

OBJECTIVES:

- ☞To integrate chemistry and biochemistry principles into real-world food science and nutritional problems.
- ☞To determine how ingredients, food components, processing, storage, etc. influences the quality, sensory, and physical and chemical parameters of finished food products.
- ☞To compare and contrast various food processing operations on the chemical changes of food components as they relate to food quality, nutrient composition and safety.
- ☞To acquire technical data and information for inclusion in a laboratory notebook while performing laboratory experimentation; to analyze the information using computer programs by tabulating data, performing calculations and statistical analyses; to document laboratory exercises by submitting reports in a standard journal format; to enhance the student's ability to present written information of a scientific nature combined with the hands-on experiences.

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Text

Jamesen, Karen. Food Science Laboratory Manual. Merrill, Prentice Hall, 1998.

Grading

	<u>Points</u>	<u>Due Date</u>
Participation 10 x 8 pts	80 (16%)	Weekly during lab
Attendance 10 x 5 pts	50 (10%)	Weekly during lab
Lab Reports (8) 3 x 20 pts	60 (12%)	Due 2 weeks after lab is completed***
3 x 30 pts	90 (18%)	
2 x 60 pts	120 (24%)	
Assignments (3) 3 x 10 pts	30 (6%)	Check for specific dates
Notebook/Data Recording 10 x 6 pts	60 (12%)	Checked weekly at end of lab
Peer Evaluation (Up to 10 pts)	10 (2%)	Last day of classes
Total	500 (100%)	

***Reports are due at various times throughout the semester. Check the Performance Calendar at the end of the syllabus for exact dates.

Lab Participation Points Scale

<u>Items</u>	<u>Points</u>	<u>Explanation</u>
Preparation	2	Student prepared, organized
	1	Student needs improvement, not organized
	0	Obviously unprepared, unfamiliar with lab
Equipment use	2	Student prepared, handles equipment properly
	1	Needs improvement in handling equipment
	0	Obviously unprepared, misuse/abuse of equipment
Safety & Attire	2	Practices good safety habits; properly attired
	1	Poor safety habits; need improvement
	0	Unsafe practices or puts others at risk; improper dress
Clean-up	2	Areas and utensils well cleaned
	1	Some items or areas overlooked or not properly cleaned
	0	Items or areas left unclean and unorganized

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Attendance:

Points

- | | |
|---|---|
| 5 | Student present for entire lab; made-up missed lab |
| 3 | Extremely late; left lab too early |
| 0 | Unexplained absence with no make-up - Note: This will usually result in a zero for the lab report as well. |

Since this is a laboratory, attendance is mandatory and will be taken weekly. Contact instructor prior to absences if possible. If you are absent, you must attend the other lab section. There are no scheduled make-up labs.

Laboratory Dress Code

Since you will be working in a laboratory environment and preparing food items for consumption, the following dress code will be enforced. This is also for your protection against spills and burns.

- No open-toed shoes or sandals are allowed. Sneakers or closed shoes that have gripping soles are best.
- No sleeveless shirts or bare mid-drifts exposed.
- Long shorts are allowed. Shorter pants expose your legs to burn hazards – wear them at your own risk.
- Long or dangling hair must be pulled back and secured. (If you must push your hair out of the way when you tilt your head down, cover or secure it.) Hair coverings are not required but are a good practice to follow.
- Rings and watches can be a source of contamination when cooking. Please remove them or use gloves when preparing and serving food items.

Laboratory Safety

GOOD LABORATORY PRACTICES are to be used in any laboratory class. For your safety,

- As much as possible, do not clutter work surfaces with papers and books. All extra bags should be placed under work tables or left in the general gathering area.
- Wash your hands and any equipment, surfaces or utensils with soap and hot water before, during and after food preparation. Items prepared in class will be eaten.
- Be aware of others around you when cooking. Burns due to hot surfaces on stoves, ovens or cookware are common. Use pot holders or hot pads to handle stove or microwave heated containers.
- Handling of sharps, such as knives, should be done with care. Never point sharp objects at another individual. Take care when cutting items; always use a cutting board.
- Clean up all spills immediately. This includes the areas around the balances, general supplies table, stoves and sinks.
- If you are not familiar with the use of a piece of equipment or a procedure, please consult the instructor.
- Report all missing or damaged items to instructor immediately.
- Dispose of food and other cooking waste in the proper containers. You will be instructed where things should go, if not, please ask.

Laboratory Notebooks

The purpose of requiring notebooks is to acquaint students with GOOD LABORATORY PRACTICES

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they will encounter in their field of study. Proper data accumulation, organization and review are necessary to validate information and form a basis for decisions made in the food industry and health professions.

- Individual labs and experiments are outlined in the **lab manual which serves as the student notebook**. Check “**Detailed Course Outline**” for specific sections to be performed that day.
- Changes in procedures, notes, all data accumulated and other information should also be written in the manual when possible. Attach additional pages within the book.
- **Each student is required to have their own notebook**. Notebooks will be checked at the end of each class period by the instructor or TA. They will review, sign and date the work.
- **It is the student's responsibility to make certain their work has been signed**. No notebooks will be signed after you have left the lab area; you will lose the 6 pts.
 - **Points scale:** 6 pts = All data properly recorded
3 pts = At least half of the required entries or data is missing; notebook missing
0 pts = No data or entries recorded

Laboratory Reports

To enhance the student’s ability to analyze and present scientific information in a logical and acceptable written format, laboratory reports will be required for each general area of study. Reports are to be organized according to the format enclosed (see final page of syllabus).

Reports are to be double spaced, typed or computer generated. Data tables and references are to be single spaced. The report will follow the “Format for Writing Laboratory Reports” outlined later.

Lab reports are to be turned in 2 weeks after the lab by 4:30 pm on the due date (see Performance Calendar). They are to be placed in the labeled box in Food Science and Human Nutrition Building, Room 359. Late reports will lose 2 pts for each day submitted after the deadline. **Reports will not be accepted beyond 7 days late and thus will result in a 0 (zero)**.

Reports can be submitted electronically under specific conditions. Please read the “Electronic Submission of Reports and Assignments” sheets. A written agreement must be submitted before any electronic submissions will be accepted.

- A) **Group Report – Type I (30 pts)** - only one report is to be submitted for the entire group. The report will follow the format outlined later. A separate cover page must include the names and signatures of “all group participants”. **All members of the group will be responsible for the content and submission. Everyone will receive the same grade for the report.**
- B) **Combined Group Report – Type II (60 pts)** - labs performed over 2 weeks will be combined into one group report. The report format will remain the same. However, since it combines 2 weeks of labs, the report will be longer and worth twice the point value. Only one report is necessary for the 2 weeks of labs. **All members of the group will be responsible for the content and submission. Everyone will receive the same grade for the report.**
- C) **Individual Report – Type III (20 pts)** – To save time and paper, the individual report format is being changed; these changes only apply to reports for Labs 1, 8 and 10. **There will be 2 parts to these reports. The cover page will contain the same information as before BUT no signatures are required on it.**

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- **Part 1 (Group section):** Only one copy of the Introduction, Procedures and Results needs to be submitted for the entire group. The entire group will receive the same grade for these sections – up to 8 points max.
- **Part 2 (Individual section):** Each person will submit their own Discussion, Conclusions and References sections. These sections will be assigned a total grade for that individual – up to 12 points max. Follow the format outlined for these sections. ***Place your name, signature & lab day just above your Discussion section; no other group members are to sign it.***
- You can attach the individual sections to the group portion or submit them separately.

It is to your advantage to review for accuracy all reports before they are submitted. Do not complain later if your partners did not do a good job. Signatures are required for all reports. Your signature verifies that you helped in writing and reading the lab report being submitted.

Laboratory Assignments

Assignments will be given during the course of the semester that relate to some aspect of the labs being conducted. The format for each will be given along with it. These are individual assignments and will be graded individually. Due dates are listed in the Performance Calendar but can be submitted earlier.

- #1 – Statistical Analysis of Variance (ANOVA) Calculations
- #2 – Document Review for Sensory Evaluation
- #3 – Sensory Panel Experience (outside class)

Peer Evaluations

In the work environment, most individuals administer patient care or perform duties as part of a team. This class will be divided into teams to perform experiments and submit reports. At the end of the semester, each individual will submit an evaluation of the other members of their team. Members are to evaluate overall performance for the entire semester. It is unfair to a fellow member to evaluate them based on one incident or your own personal bias for or against them.

Team members will be evaluated for their performance in the following areas:

- Communication (2 pts): Communicates effectively and in a timely manner
- Responsibility (6 pts): Has assumed responsibility for tasks throughout the semester
Has contributed to the completion of team assignments and reports
- Attitude (2 pts): Maintains a positive and flexible attitude

The final points awarded will be based on an average of the other team members' scores. The peer evaluation is only 2% of your total grade. However, it is important as an indicator of your ability to work with others to complete projects and assignments.

Grading Scale:

93 - 100%	A	73 - 79%	C
90 - 92%	B+	70 - 72%	D+
83 - 89%	B	60 - 69%	D

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80 - 82%

C+

Below 60%

E

Academic Honesty: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *“We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.”* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”* It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>.

Software Use: All faculty, staff and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

Online Course Evaluation Process: Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

Services for Students with Disabilities: The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation: 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources: Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

· University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/

Counseling Services; Groups and Workshops; Outreach and Consultation; Self-Help Library; Wellness Coaching

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- U Matter We Care, www.umatter.ufl.edu/
- *Career Resource Center*, First Floor JWRU, 392-1601, www.crc.ufl.edu/

Examinations: There are no written examinations for this lab class. Grading will be based solely on laboratory attendance, participation, reports, assignments, notebooks and peer evaluation.

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Performance Calendar 2017

ASSIGNMENTS	PERFORMED	REPORT DUE
Assignment #1 – Analysis of Variance Calculations (ANOVA)	Outside class	1/ 27
Assignment #2 - Document Review for Sensory Evaluation	Outside class	2/ 24
Assignment #3 – Sensory Panel (Taste Panel room; Building 120)	Aquatic Foods Pilot Plant	4/ 7
LABORATORIES	*****	*****
No lab meetings this week	1/ 3 & 5	No Report
Introductory Session & Sensory Evaluation (101 Aquatic Food Products Building)	1/ 10 & 12	No Report
#1. Measurement Exercises: Dry & Liquid Measures (Type III report)	1/ 17 & 19	2/ 3
#2. Water Reactions: Moisture, Water Activity & Freezing (Type I report)	1/ 24 & 26	2/ 10
#3. Carbohydrates I: Sugars & Cereal Grains (Type II report ¹)	1/31 & 2/2	2/ 24
#4. Carbohydrates II: Pasta Products & Thickening Agents (Type II report ¹)	2/ 7 & 9	
#5. Lipids I: Emulsions/Emulsifiers & Fat Replacers (Type II report ²)	2/ 14 & 16	3/ 13
#6. Lipids II: Fat Absorption & Fats in Baked Goods (Type II report ²)	2/ 21 & 23	
#7. Proteins: Foaming Effects, Cooking Effects & Coagulation (Type I report)	2/ 28 & 3/2	3/ 17
SPRING BREAK WEEK – NO LAB CLASSES	3/ 7 & 9	NA
#8. Enzymes: Proteolytic, Discoloration and Inactivation (Type III report)	3/14 & 16	3/31
#9. Food Additives: Leavening Agents (Type I report)	3/ 21 & 23	4/ 7
#10. Pigments: Effects of Cooking Conditions (Type III report)	3/ 28 & 30	4/ 14

You will write a total of 8 laboratory reports. **All reports are due 2 weeks after the lab by 4:30 pm.**

REPORTS

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Type I – Regular group reports are worth 30 pts.

Type II – Combined group reports are worth double the point total (60 pts).

Type III – Group & Individual Sections Reports are worth 20 pts.

All Assignments are individual reports worth 10 pts.

Format for Writing Laboratory Reports

I. Cover Page

Title and Number of Lab; Performance dates; Day of the week and group number
Names of the lab group members with signatures (*see exceptions under Type descriptions*)

II. Introduction (Approximately ½ - 1 page in length) 2 Points

Include: (a) some general background info and (b) purpose or objectives in your own words.

III. Procedures 3 Points

- 1) Mention and cite laboratory book or procedure sheets. Be sure to reference them.
- 2) Do not restate all the procedures - this is a waste of time and effort
- 3) Only list major changes from original lab procedures if any.
- 4) Mention samples test and brand names

IV. Results 8 Points

1) Present data in the form of tables or other appropriate format; 2) Number and label tables; 3) Show sample calculations when necessary; 4) Show statistical analysis where possible. (Raw data will be sent in Excel format).

V. Discussion (Subtitle individual sections)

Briefly discuss the results as to what happened and why. Then, answer any required questions; state question and then the answer.

Note: To get the full points possible, you will need to look up additional information on the subject and incorporate the information into your discussion. Be sure to cite the information and reference it. Appropriate library information includes books (class text, reference books, etc.), journal articles, etc. Scientific web sites may also be used if properly referenced. 10 Points

VI. Conclusions 3 Points

Conclude how these results may relate to real life situations; how it may be useful and to whom. Summarize the major points from your discussion.

VII. References (A minimum of 2 are required)

Remember to cite all references used according to scientific journal format. (Refer to the Journal of Food Science for proper format to use. Be consistent.) List references in numerical order as they are presented in the report. Web sites from colleges/universities, government agencies, companies or scientific journals can be used but you must include the author/writer, article title, source of information (company or college name), date of publication, and web address. 4 Points

Total 30 Points**

Above values are for **Type I - Group Reports worth **30 points**.

For **Type II - Combined Group Reports**: Introduction (4 pts), Procedures (6 pts), Results (16 pts), Discussion (22 pts), Conclusions (6 pts), and References (6 pts). **Total value = 60 pts.**

For **Type III - Reports: Group section** [Introduction, Procedures, & Results = 8 pts] + **Individual section** [Discussion, Conclusions & References = 12 pts]. **Total value = 20 pts.**

Bonus points may be awarded for exceptionally high quality work.