

FATS AND OILS APPLIED TECHNOLOGY FALL 2016 SYLLABUS
Dual Level Course - FOS 6936 (2714) / FOS 4936 (18HD)
3 units credit (2 units lectures; 1 unit Laboratory)

Lectures: Location (FAC 120) on **Wednesdays (10:40 – 12:35 AM)**

Laboratory: FSHN Bldg. Process Lab on **Fridays at 10:40 – 12:35 AM)**

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Office Hours: (Wednesdays & Fridays)

Course Description:

The course is designed for PH D, Masters, and graduating candidates in the Department of Food Science and Human Nutrition and it involves lectures and 15 hours of laboratory. The lectures deal on the basic science of the three leading vegetable fats and oils (soybean, canola and HIGH OLEIC palm oils) with emphasis on their physicochemical and biochemical properties and their relevance on the processing, applications and utilization in foods. The laboratory will involve elucidation of the knowledge gained in the lectures by actual processing of a specific food utilizing the functional shortening developed by the class.

Prerequisites: Undergraduate courses in biochemistry and organic chemistry.

Objectives:

1. To provide the general knowledge on the agronomy, production and trade of the current domestic and offshore oilseeds (soybean, canola and high oleic -palm).
2. To provide the basics of the critical parameters involved in the extraction, refining, bleaching, deodorization of fats and oils and their modifications (blending, interesterification, emulsification, sonication, votation, fractionation and genetic manipulation) into functional shortenings and the subsequent handling and the preservation of their quality.

3. To provide the basic chemistry of fats and oils with focus in the understanding of the relevance of their physicochemical and biochemical properties in their functions as ingredients in foods.
4. To provide knowledge and understanding of the changes and reactions of fats and oils in the food system influencing the stability of the finished food.
5. To provide the fundamentals of the metrics for assessing the quality of fats and oils that are relevant to the safety of their usage as ingredients in the food system.
6. To provide the updated knowledge on the nutritional and health benefits of fats and oils focusing on the myths and realities of the ingredients.
7. To provide hands on experience in the differentiation of the functionality of fats and oils as applied in the food system.

Format: Lectures will involve discussions on relevant issues and further clarifications on the topics. Laboratory exercises will provide actual evaluation of the properties of the specific fats blended in the laboratory and their performance on the quality attributes of the processed food.

Exams: Two written exams involving the application of the knowledge gained in the lectures and discussions. **The schedule of the exams will be determined and posted in the Schedule of Lectures.**

Grading:	Percent of Grade
Written examinations (2) -----	90
Laboratory (Blending of the fat and Baking of the food)	10

The current grading system of the University of Florida that includes the use of minus grades will be followed.

All Lecture Materials: Posted in CANVAS.

Additional reading references

- Chemistry and Technology of Oils and Fats. 2003
- Fats and Oils: Formulating and Processing for Applications. 2008
- Palm Oil: Production, Characterization, and Uses. (AOAC Monograph Series on Oilseeds). 2012
- The Oil Palm. 2012
- Processing and Nutrition of Fats and Oils. 2013

Course Content:

1. Chemistry of fats & oils (emphasis on soybean oil, canola oil, and high oleic palm oil)
2. Evolution of business initiatives: Functionality of fats & oils in Food Systems
3. Supply chain and trade challenges
4. Processing of fats and oils
 - a. Extraction
 - b. Refining
 - c. Bleaching
 - d. Deodorization
 - e. Storage & Handling
5. Modifications of fats & oils into functional shortenings
 - a. Blending
 - b. Emulsification / Sonication
 - c. Interesterification
 - d. Votation
6. Chemistry & Stability of fats & oils
7. Heart Healthy fats & oils: Information on health benefits
 - a. Studies by Loders Crokiaan
9. Laboratory Program
 - a. Blending of shortening by emulsification
 - b. Baking & Quality Evaluation of the food prototype

All Lecture Materials: Posted in Canvas

Schedule of Examinations (Tentative): At FAC 120

Examination #1- September 21, 2016 (10:40 AM – 12:35 PM)

Examination #2- November 9, 2016 (10:40 AM – 12:35 PM)

Lecture Schedules: Revised List

Protocol during classes & laboratory:

1. Turn off cell phones
2. Raise hands for discussions, clarifications, & questions : The course is meant to be interactive. One conversation at a time.
3. Enough time will be provided for note taking.
4. **During the laboratory, pay full attention in the use of the equipment (SAFETY !). Wear apron, safety goggles & disposable gloves. Clean up the place after the exercise.**