Professor: Dr. Clinton Allred

Classification: Juniors and seniors who have at least two semesters remaining will receive preference for enrollment. This gives students more time to make decisions and apply to graduate programs after the class. However, underclassmen (particularly sophomores) will also be considered.

Prerequisites: None

GPR Requirement: 2.8

Time Required: At least 2 ½ hours twice a week

Research: One of the main goals of the class is to introduce students to what they can expect if they choose to attend graduate school. We are seeking motivated students who are interested in learning about nutrition related research and exploring the possibility of graduate school to participate in NUTR 485/491. My laboratory conducts research evaluating the effect of dietary compounds on the development and progression of both breast and colon cancer. Specifically we study how things in the diet mimic the effects of naturally occurring hormones in the body. Ongoing projects are focused on estrogenic compounds in plants such as soy, while other studies are exploring the effects of omega-3 fatty acids found in fish.

Student Role: Students will be introduced to a variety of common research techniques and learn fundamental principles of cancer biology.

Additional Information: All interested students need to complete the entire application. In addition, in the space provided for comments the applicant needs to answer the following question. Why do you want to participate in this class? I anticipate taking at least two students each semester including both Fall and Spring and during the long summer session.

Professor: Dr. Robert S. Chapkin

Classification: Any

Time Required: A minimum of 9 hours per week

Minimum GPA: 3.25

Pre-requisites: None

Research: Dr. Chapkin's lab investigates the impact of dietary fat and fiber on the cellular "signaling cascades" in the colon. His laboratory is involved in Systems Biology, the modeling and understanding at the molecular level of the dynamic relationships among diet and biological molecules which regulate
colon cancer development. He has demonstrated that omega 3 fatty acids regulate the transmission of information that alters physiological responses such as cell growth, differentiation, apoptosis, DNA methylation status, membrane microdomain organization, and protein trafficking, thereby ultimately determining the risk for developing colon cancer. Findings from his studies indicate that the chemopreventive effect of fish oil is due to the direct action of omega 3 fatty acids and not to a reduction in the content of omega 6 fatty acids. He has developed noninvasive methodology for monitoring global changes in intestinal gene expression. This effort has generated a patent and an NIH initiated and sponsored clinical intervention trial.

Dr. Chapkin's laboratory is also investigating the mechanisms by which dietary lipids and phytochemicals, e.g., docosahexaenoic acid (DHA) and curcumin, modulate effector cells (T-lymphocytes) of the immune system. He is involved in studying the role of lipids as mediators of chronic inflammation. He has demonstrated that dietary DHA and curcumin alter T-lymphocyte membrane microdomain composition and suppress cytokine production. Elucidation of the mechanisms by which DHA and phytochemical feeding suppress T-lymphocyte function will lead to the establishment of dietary guidelines designed to reduce the incidence and severity of disorders that involve an inappropriately activated immune response (e.g., inflammatory bowel disease, ulcerative colitis) without increasing the susceptibility to infection. This is important because epidemiological and preclinical studies indicate that dietary EPA and DHA-induced shifts in inflammatory processes, in part, account for their anti-tumorigenic properties in colon cancer.

Professor: Dr. Yenory Hernández-Garbanzo

Classification: Any

Time Required: Variable for each position and number of credits taken. Two-semester commitment preferred. The learning objectives, plan of work, expected outcomes and exact time commitment of work per week will be discussed between Dr. Hernández and the selected student(s).

Minimum GPA: 3.0

Pre-requisites: Instructor’s Permission; NUTR 202 or NUT203 recommended.

Research Areas: Dr. Hernández actively collaborates in multi-state projects for enhancing the current evaluation methods and overall effectiveness of federally funded community-based and school-based nutrition education programs, targeting low-income/multi-diverse audiences. The Youth EFNEP Multi-State Evaluation project is a collaborative project between researchers from Cornell University, Michigan State University, Ohio State University, Rutgers University, Penn State University, Texas A&M University and Clemson University, which aims to enhance the validity and reliability of the national youth evaluation tools for the Expanded Food and Nutrition Education Program (EFNEP). Dr. Hernández is one of the Co-principal investigators of this multi-state team, and is responsible for applying a wide variety of survey development and testing techniques; preparing data collection
protocols; coordinating training and data collection; analyzing qualitative data; and preparing reports to the national office (to USDA-NIFA EFNEP national leaders).

Dr. Hernández’s research work also focuses on the design, implementation and evaluation of science-based, innovative, culturally appropriate and theory-based behaviorally focused nutrition education curricula, strategies, and capacity-building approaches for promoting the use of locally grown available foods, and for preventing obesity and food insecurity, at both, the local and global level.

**Student Role:** First, the student(s) will receive training about current theories and research techniques related to the design, implementation, measurement and evaluation of nutrition education programs. Then, a variety of research techniques in the area of nutrition education will be employed, including systematic literature reviews, curricula content analysis, quantitative and qualitative approaches to formative research and/or evaluation of nutrition education programs. Also, the student will actively participate in multi-state conference calls and will assist in the necessary tasks carried out by the Youth EFNEP multi-state team and/or other research projects. One of the ultimate goals of this research experience is to help the student prepare a scientific manuscript and/or research presentation that will reflect the work done through at least two consecutive semesters.

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**Professor: Dr. Karen Kubena**

**Classification:** Junior or Senior

**Prerequisites:** Approval of instructor

**GPR Requirement:** 3.0

**Time Required:** 1 or 2 credits (3 hours/credit)

**Research:** Decisions about which foods are eaten by humans depends upon variables, including family and friends, culture and many other variables. Identifying factors that play a role in food choices and other lifestyle behaviors allows development of educational and other programs designed to achieve and maintain healthy weight and optimal nutrition in children and adolescents. This is the focus of our research.

**Student Role:** The student will conduct a literature search and prepare a paper on an aspect of food preference and food use. Routine meetings will facilitate the process.
Professor: Dr. Caurnel Morgan

Classification: Junior or Senior

Time Required: at least 8 hours per week

Minimum GPA: 2.75

Pre-requisites: Instructor’s Permission; NUTR 369 recommended

Research: We study diet interactions with brain functions related to anxiety and depression. We also study how overconsumption of fat promotes obesity-related disease.

Student Role: (NUTR 491 Research only) training in behavioral analysis and molecular biology; contribution to research projects

Professor: Dr. Peter S. Murano

Classification: U1-U4

GPR Requirement: 3.0+

Other prerequisites: Seeking an undergraduate student who has completed FSTC 201 and/or NUTR 202, and who is mature, dependable, able to follow directions, and able to work well in a team setting.

Time Required: Variable – commensurate with hours worked per week that correspond to one, two, or three credit hours (between 1 and 3 credit hours are available, the exact time commitment of work per week to be discussed/established between the student and Dr. Murano). Students will be working with one or more graduate students (M.S. and/or Ph.D) and must responsibly coordinate their time/efforts with them. Weekly progress reports must be provided to Dr. Murano by the student (email OK) in order to receive a passing grade. Beyond that, a final exit interview (informal) with Dr. Murano and 3-5 page summary report is required to receive a letter grade of C or higher.

Research: The obesity epidemic has created the need for innovative research to aid in the quest for viable weight loss strategies. An approach is to investigate the satiety mechanism, and the role of food substances which can impact satiety - and potentially lead to a decreased caloric intake. These include novel lipid emulsions and potato proteinase inhibitor 2 (PI2). Such food-derived factors may promote satiety due to cell signaling via the ileal brake, or a slowing of protease-mediated degradation of cholecystokinin (CCK)-releasing factor.
The objective of the research will be to explore the satiating effects of food substances/ingredients when administered (a) to an in vivo cell culture, and (2) to consumers through a variety of beverage formulations, including identification of any synergistic effects.

**Student Role:** A variety of research approaches to study satiety will be employed. Direct or indirect stimulation of biomarker CCK will be examined in the STC-1 cell line. In addition, new product (beverage) formulations will be developed incorporating satiety ingredients to have (a) acceptable sensory profiles as determined by appropriate product formulation and development utilizing consumer sensory testing, and (b) satiety effects determined through the use of VAS (visual analog scales) using human volunteers. There may or may not be time to perform a pilot clinical study using human volunteers that looks at blood levels of key biomarkers.

**Additional Information:** I appreciate being able to place a motivated and talented individual in my laboratory this semester for this exciting research project.

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**Professor: Dr. Suresh Pillai**

**Classification:** undergraduate preferably Junior or Senior

**Prerequisites:** an interest in microbiology and laboratory research

**GPR Requirement:** none, as long as you can demonstrate your ability to contribute in a research setting

**Time Requirement:** about 12 hours a week if you want to perform research work for credit. Otherwise about 5-10 hours a week if you want to gain some understanding of what laboratory research means.

**Research:** My laboratory is a microbiology laboratory. We work on research projects that extend pretty much from septic tanks, sandwiches, and up to the space station. We work on projects at the interface between food safety, public health and environmental microbiology. Students will have the opportunity to gain experience in classical microbiology techniques, molecular microbiology techniques, pathogen decontamination technologies and environmental treatment technologies.

**Student Role:** Work in a team along with graduate students and senior scientists. The extent to which an undergraduate student will have the opportunity to contribute to projects will depend on their initiative, drive and sense of responsibility. My laboratory has always supported a number of undergraduates, some of whom have been selected as Undergraduate Research Fellows at TAMU and have since gone on to graduate and professional programs.

**Additional Information:** The laboratory works with food borne and water borne pathogens. These include bacteria, viruses and protozoa.
**Professor: Dr. Steve Talcott**

**Classification:** Juniors and seniors, food science or nutrition students.

**Prerequisites:** None

**GPR Requirement:** None

**Time Required:** Variable; depending on number of credits taken.

**Research:** To conduct phytochemical extractions and analysis of bioactive compounds in fruits and vegetables, dietary supplements, and botanicals per the direction of current research objectives.

Undergraduate students will be paired with a graduate student or other experienced personnel as their mentor, and assistant and learn in hands-on applications.

**Student Role:** Students will be introduced to a variety of food analytical techniques and learn-by-doing in a hands-on experiences that may range from washing lab ware to advanced LC-MS analysis.

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**Professor: Dr. Susanne Talcott**

**Classification:** Juniors and seniors who have at least two semesters remaining will receive preference for enrollment. This gives students more time to make decisions and apply to graduate programs after the class. However, underclassmen (particularly sophomores) will also be considered.

**Prerequisites:** None

**GPR Requirement:** 2.8

**Time Required:** 2 semester commitment, at least 4 credit hours/semester

**Research Interest:** Dr. Susanne Talcott's overall research objective is to assess bioactive compounds in fruits and vegetables, dietary supplements, antioxidant fruit juices and other foods, in their role in the prevention of chronic diseases and the protection of health in an integrative, translational research approach (bench to bedside). Dr. Talcott is also working in the improvement of quality and determination of health benefits of grapes and wine in collaboration with the Texas Wine and Grape Industry. Millions of Americans consume plant based foods, including dietary supplements and functional foods with the hope of preventing or even treating chronic diseases. However, very little research investigating the efficacy of antioxidant foods has been performed. Hence, consumers as well as food industry, have very little to no guidance regarding efficacy and dosing recommendations for these products.
It is our goal to establish efficacy, safety and dosing recommendations for plant based bioactive compounds, using pharmacometric tools and disease specific biomarkers for cardiovascular disease, diabetes and cancer. Including antioxidant endpoints as well as biomarkers for inflammation, vascular endothelial function, apoptosis, cell signalling and translational regulation.

**Student Role:** Motivated students will be introduced to a variety of common research techniques and learn fundamental principles of molecular biology relevant to bioactive plant compounds in the prevention of chronic diseases.

**Professor: Dr. Matthew Taylor, Assistant Professor, Dept. Animal Science.**

**Classification:** Juniors in FSTC are preferred, but NUTR (Science option) students will also be considered. Students with sophomore status will be considered for FSTC 485 participation, but not for 491 credits.

**Prerequisites:** Students should have completed DASC/FSTC 326 and 327, or be in process of completion of courses, with at least a B average being obtained in each class. Should also have completed the required organic chemistry sequence, or be in the process of completion, with at least a B average in each course. Unofficial transcripts must be provided by the student to the instructor, or written waiver allowing the professor to access student grades in conjunction with departmental advising staff.

**GPR Requirements:** No minimum GPR is required, but will be assessed on a case-by-case basis. Students possessing at least a 3.5 GPR within their major will be given preference when multiple candidates apply for a listed opportunity.

**Time Requirements:** Time requirements will be outlined for each position and may differ between positions based on learning outcomes/objectives, student course enrollment, type of course credit obtained (i.e. 485, 491), and student scheduling commitments. Generally, at least 2 hours/week are anticipated for every credit of 485 earned, while 2.5-3 hours/week are anticipated for every credit of 491 earned.

**Research:** Food Safety Microbiology. The food antimicrobials research laboratory (FARL) investigates the functionality and mechanisms of action of multiple food antimicrobial compounds, including the organic acids, bacteriocins, and lytic enzymes (e.g. lysozyme). Studies are both basic and applied in nature, and may include research on the encapsulation and micro-analysis of antimicrobials. The laboratory is certified Biosafety Level 2 (BL2) and all members must maintain up-to-date training and certification status. Students must adhere to safety protocols outlined for work in the FARL or risk expulsion and loss of course credit or a failing grade for credits sought.

**Student Role:** Undergraduate roles vary from those developing written reviews of ongoing research and background research that contribute to development of refereed papers and abstracts to assisting
in the gathering of experimental data in conjunction with graduate research and under the supervision of instructor and graduate students.

**Additional Information:** None

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**Professor: Dr. Nancy Turner**

**Classification:** Sophomore - Senior

**Pre-requisites:** No specific course prerequisites are needed.

**Time Required:** The greatest consideration will be given to students who are seeking 2 or more hours of credit (at least 6 hours of time in the lab each week). One hour of credit would only be considered for 285 or 485 students.

**Research:** Our research evaluates the effects of bioactive molecules present in our diets on various aspects of inflammatory bowel disease and colon cancer development and prevention. We use animal models to study how dietary factors influence the balance between new cell formation and cell death, oxidative stress and regulation of gene expression. Our goal is to identify compounds present in foods that are able to suppress these diseases.

**Student Role:** 285 or 485 students would be involved in a review of the literature, which includes searching databases and summarizing their findings. In addition, directed studies students would be exposed to the laboratory and the techniques used for our experiments. The level of activity would depend on the student's background and training.

Ideally, 291 and 491 students would have completed a 285 or 485 course prior to initiating the research class. These students would be provided with a small research project for the semester, if sufficient time was available. The project assigned would depend on the student's schedule. The work could include care of animals, collection of samples or sample analyses.

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**Professor: Dr. Chaodong Wu**

**Classification:** Prefer completion of NUTR 470 but not required

**Prerequisites:** Prefer junior but seniors may also apply

**GPR Requirement:** 3.0

**Time Required:** At least 4 hours per week
**Research**: The Wu Lab has expertise in nutrition, metabolism, and integrative physiology. Currently, the research in Wu Lab is focused on elucidating roles of inflammation-metabolism interactions in overnutrition-associated insulin resistance, adipose tissue inflammation, and hepatic steatosis and liver inflammatory response. The Wu Lab is also interested in exploring roles of inflammatory and signaling molecules in regulating atherosclerosis, and in studying myeloid cell functions in metabolic diseases. Both cellular and integrative approaches are employed by the Wu Lab. In particular, the ongoing projects in the Wu Lab involve a number of mouse models in which gene(s) are over-expressed or disrupted in a cell-specific manner.

**Student Role**: Student will conduct experiments including PCR, DNA digestion, gel electrophoresis, and cell culture.