Tuskegee University
College of Agriculture, Environment and Nutrition Sciences
Master of Science (MS) in Food and Nutritional Sciences

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Degrees Offered: Master of Science (M.S.) in Food and Nutritional Sciences, Thesis and Non-Thesis Options

* For additional information please refer to the Graduate Handbook.

The Department of Food and Nutritional Sciences offers a two-year degree program leading to the Master of Science in Food and Nutritional Sciences with two major options: Food Science or Nutritional Science. Graduate study provides the opportunity for greater breadth and depth in a selected area of specialization to prepare students for work in myriad of industries.

Admission Requirements:

All students accepted into the graduate program, must have a B. S. degree from an accredited university in food science, nutrition, general dietetics or in a related STEM area as biology, chemistry, engineering, etc.

- Prerequisite academic work should provide evidence that the applicant should be able to pursue the graduate course of study effectively; if a student comes from a related major one course in food science and one in nutrition are required;
- Applicants must have a cumulative GPA of 3.0 or better.
- GRE score is required
- Official Transcript from all colleges/universities attended (International Students must have transcripts translated through World Education Services -WES)
- Application fee satisfied
- 3 Letters of Recommendation
- Statement of Purpose
- Financial Affidavit (International Students –only)
- Test of English as Foreign Language (TOEFL) Scores (International students only).

Graduation Requirements:

Core Courses: 18 credits
Food Science Emphasis: 9 Credits or more
Nutrition Science Emphasis: 9 Credits or more
Thesis research: 6 credits
Thesis Proposal Defense
Course Academic Defense
Admission to Candidacy
Passing of the Final Oral Examination

Thesis Committee:

During the first semester of his/her study in the Master of Science program, all incoming graduate students are requested to meet each graduate faculty to discuss possible research options and opportunities; Subsequently, student will choose a major professor; the student and professor meets weekly to begin drafting ideas for a

thesis proposal for presentation and defense before a five (5) member committee; this committee also serves for the academic and thesis defense. This committee is selected by the student and his/her major professor. and Approval is provided by the head of the department.

Core Courses (18 credits): Required for All Students in the Master's program

EVSC 0500	Biostatistics I	3 credits
NUSC 0501	Professional Seminar (2nd Semester)	1 credit
FOSC 0505	Methods of Food and Nutritional Analysis (Lecture)	2 credits
FOSC 0506	Methods of Food and Nutritional Analysis (Lab)	2 credits
FOSC 0510	Food Chemistry	4 credits
NUSC 0554	Seminar in Food Science and Nutritional Science (Required to be taken for 2 semesters)	1 credit
CHEM 0561	Biochemistry I	3 credits
CHEM 0562	Biochemistry Laboratory	1 credit

0700 Research in Nutritional Science or Food Science (1-2 credit hours taken at a time) 6 credits

FOOD SCIENCE EMPHASIS: 33 hours

FOSC/NUSC 500A	Scientific Research Methods	3credits
NUSC 0650/0651	Vitamins and Mineral in Human Nutrition or Human Nutrition and Health	3 credits
FOSC 0661	Food Ingredient Chemistry	3 credits

NUTRITION SCIENCE EMPHASIS: 33 hours

NUSC 0650	Vitamins and Mineral in Human Nutrition	3 credits
NUSC 0651	Human Nutrition and Health	3 credits
NUSC 0652	Nutrition and Disease	3 credits

Elective Food and Nutritional Sciences Courses (32 credits available): Selected by Student and Major Professor

Elective courses may be chosen from any graduate level course listed as an elective in the Department of Food and Nutritional Sciences. Other graduate elective courses may also be taken at Tuskegee University or elsewhere upon the approval of the major professor.

Transfer Credits

The student's Advisory Committee may recommend transfer credits for up to 9 hours for graduate courses taken by the student at Tuskegee University as part of another graduate program or at any other institution. Transfer credits may be recommended under both core and elective categories.

Admission to Candidacy

Immediately after completing one year ~ 18 hours of course work at Tuskegee University, the student must submit to the Dean of Graduate Studies, a completed application for the Candidacy for the degree.

Seminars

A student pursuing the Master of Science degree in Food and Nutritional Sciences must present at least two seminars. The first seminar should be the presentation of the student's research area of interest for the Master's thesis. The second or the final seminar shall be his/her thesis research for the degree.

Thesis Proposal Defense

A thesis proposal developed for presentation and defense before a five (5) member committee (this committee also serves for the academic and thesis defense) must be done after one year in the program.

Course Academic Defense

Students are required to have an academic defense covering course content in their major area.

Thesis

The final draft of the thesis must be filed with the student's Advisory Committee at least 30 days before the date listed in the university calendar for final copies to be submitted during the semester in which the student expects to graduate. The student must present to the Dean of Graduate Programs a "Preliminary Approval Sheet" (PAS) bearing the signature of the Major Professor before the final oral examination may be scheduled and before copies of the thesis/dissertation are distributed to members of the Examining Committee.

After the "Preliminary Approval Sheet" has been signed, it should be submitted to the Dean of Graduate Programs before the final examination is scheduled and before the final draft of the thesis/dissertation is prepared for final approval. Approval of the thesis/dissertation in its final form rests with the Examining Committee.

Non-Thesis

This program is a 12 to 18 month program requiring 30 course hours from core and the student's major emphasis (nutrition or food science). Students are required to take a final examination and pass with a minimum of an 80 %. Only one retake is allowed.

Research assistantships and fellowships are available for students admitted to the program. Continuation of the financial support depends on student's performance in course work and research, and availability of funds.

List of core Courses

NUSC 0500. INDEPENDENT STUDIES IN FOOD AND NUTRITIONAL SCIENCE. 1st and 2nd Semesters, Summer, 1-3 credits.	Designed to provide credit for independent research studies for both undergraduate and graduate students. This course is developed especially for students in the Department of Food and Nutritional Sciences. The course deals with current research and development issues in food and nutritional sciences. Permission of instructor.
NUSC 0500A Scientific Research Methods	This course prepares students to design experiments, analyze data, evaluate results and report findings. The course covers ethics in research, selection of the research topics, planning the research, writing up the plan as a research protocol, implementing the research project, de-scribing and analyzing the research results, assessing and evaluating research done by others, writing and publishing a scientific paper; and how to work collaboratively with a mentor-mentee relationship with a Tuskegee faculty advisor. The curriculum is sequential, helping students to identify or clarify a study topic, formulate inquiry questions, organize a literature review, and select appropriate research designs and methodologies. At the end of the course students should develop a proposal to use as the basis for their thesis/dissertation. .
NUSC 0501. PROFESSIONAL SEMINAR, 2nd semester. Lect. 1, 1 credit.	This course serves as the food and nutritional sciences senior and graduate level course that incorporates training in professional ethics, professional and technical skills development and conflict resolution as well as careers and career alternatives in dietetics, food or nutrition professions. Guest lecturers bring the benefits of real work world experiences to the classroom. During the semester, a focus on

	skills to seek and obtain employment, maintenance in professional organizations, continuing education and professional development are also emphasized. Permission of the instructor.
FOSC 0502. ADVANCED MEAT SCIENCE. 2nd Semester Lect. 2, Lab 3, 3 credits	Physical, chemical, microbiological and histological, characteristics of meats. Processes affecting meat quality and methods of analysis. Prerequisites: PHYS 0301; CHEM 0320.
FOSC 0505. METHODS OF FOOD AND NUTRITIONAL ANALYSIS. 1st Semester. Lect. 2, 2 credits.	A lecture course designed to teach and demonstrate to student's current theory and analytical techniques including sensory evaluation that may be employed for conducting research in food science, nutrition and agriculture. Students will have the opportunity to execute the experiments in FOSC 506. Prerequisites: CHEM 0320 or CHEM 0360 and 0561.
FOSC 0506. METHODS OF FOOD AND NUTRITIONAL ANALYSIS LABORATORY. 1st Semester. Lab 4, 2 credits.	A laboratory course for FOSC 0505 designed to develop skills and techniques used in food and nutritional science research. Current analytical methods employed focus on food, nutrition and agriculture. Pre-co requisites: FOSC 0505; CHEM 0320 or CHEM 0360 and 0561.
FOSC 0507. APPLIED FOOD MICROBIOLOGY.	The lecture part of this course is designed to introduce the student to food microbiology, and particularly, the interaction of microorganisms with food. Emphasis is placed on the types and role of microorganisms in food spoilage, food borne pathogens, and methods designed to control microbial spoilage of foods. Laboratory sessions are geared towards methods of determining types of microbial contaminants in foods, and methods of preservations and sanitation in food handling facilities. Prerequisite: BIOL 301.
FOSC 0510. FOOD CHEMISTRY. 2nd Semester. Lect. 4, 4 credits.	Chemistry of macro- and micro-elements in various foods, fruits, vegetables, cereals, meats and dairy products; changes of nutrients during storage and processing; and application of this knowledge to quality and product development in the food industry. Prerequisites: FOSC 0301 or CHEM 0320; PHYS 0301; MATH 0207.
NUSC 0521. MATERNAL AND CHILD NUTRITION. 1st Semester. Lect. 3, 3 credits.	The principles of nutrition with emphasis on requirements during pregnancy and childhood, from infancy through pre-school age. Prerequisites: NUSC 0302; NUSC 0343.
NUSC 0522. ADVANCED COMMUNITY NUTRITION. 1st Semester. Lect. 2, Lab 3, 3 credits.	Students learn about community foods and nutrition programs relative to their background, authorizing legislation, target population, and nature and scope of services rendered. They also observe, participate and learn how to evaluate community nutrition programs. Prerequisite: NUSC 0302.
FOSC 554. SEMINAR IN FOOD SCIENCE AND NUTRITIONAL SCIENCE. 1st and 2nd Semesters, 1 credit.	Students are required to present professionally and logically an in-depth and critical review of the literature on current topics in the area of food science or nutrition during the first semester, followed by a presentation of his/her thesis research topic during the second semester. Each seminar is expected to stimulate audience participation and discussion. Faculty and guest lecturers are also invited to present topics of interest in specialized areas. Special Permission of the instructor.
FOSC 0571. FOOD PROCESS ENGINEERING TECHNOLOGY. 2nd Semester. Lect. 3, Lab 3, 4 credits.	This course is designed for students majoring in food science or other related disciplines. The course will provide the student with the critical thinking and problem solving skills used in food engineering, an understanding of the engineering concepts associated with how the physical properties of food materials are applied in processing, thermal processing, refrigeration, drying, evaporation, separation and unit operations used in the analysis and design of food and biological systems. The techniques and effectiveness of food

	packaging are also covered. Prerequisite: PHYS 301; MATH 207
FOSC 0573. PRODUCT RESEARCH INNOVATION AND SENSORY EVALUATION OF FOODS. 2nd Semester. Lect. 2, Lab 4, 4 credits.	This course will serve as the food science senior level capstone course that incorporates and unifies the principles of food chemistry, food microbiology, food engineering, food processing, nutrition, sensory analysis and statistics. Teaching methods will include a class and laboratory setting for product research, innovation and sensory evaluation of foods. Prerequisite: PHYS 301, MATH 207, Core Food Science Courses.
NUSC 0580. INTERNATIONAL NUTRITION PROBLEMS AND POLICIES. 2nd Semester. Lect. 3, 3, credits.	This course is designed mainly to acquaint the student with food and nutrition problems in developing countries. Nutrition problems, their causes, prevalence, treatment, and control are emphasized. Government policies, their impact on solving nutritional problems and available nutrition services at government and local levels are also discussed. *Prerequisites:* NUSC 0111, NUSC 0302.
NUSC 0608. RECENT NATIONAL AND INTERNATIONAL DEVELOPMENTS IN FOOD SCIENCE AND NUTRITIONAL SCIENCE. 2nd Semester, Lect. 3, 3 credits.	This course is designed to update and enhance students' knowledge in the area through discussions of selected topics in international development related to food and nutrition. Students are required to critically evaluate existing research to determine if research needs are being met and to apprise themselves of the many ways in which data are presented. Prerequisites: EVSC 500; NUSC 0302.
NUSC 0650. VITAMINS AND MINERAL IN HUMAN NUTRITION. 2nd Semester. Lect. 3, 3 credits.	Current developments in the area of macro and micro-elements, fat and water soluble vitamins. Chemical structures, biochemical functions and interrelationships, metabolism and utilization, nutrient interactions, dietary requirements, clinical implications of deficiencies and toxicity of these nutrients are studied in detail. The course also covers a discussion and evaluation of recent developments in the area of vitamins and mineral. Prerequisite: NUSC 0302 and Co-requisite: CHEM 0561.
NUSC 0651. HUMAN NUTRITION AND HEALTH. 1st Semester. Lect. 3, 3 credits.	The metabolism of carbohydrates, lipids and protein and their interrelationships is studied in this course. An evaluation of nutritional status in health as well as energy, nutrient requirements throughout the life cycle, an evaluation of the nutrient quality, phytochemical content and functionality of various foods and their ability to satisfy nutrient requirements is also addressed. Prerequisite: NUSC 0302 and Co-requisite: CHEM 0561.
NUSC 0652. NUTRITION AND DISEASE. 2nd Semester. Lect. 3, 3 credits.	Evaluation of nutritional status, normal and disrupted homoeostatic conditions of cells, and biochemistry of nutritional diseases. Maintenance of health and medical nutrition therapy are emphasized. The etiology, pathophysiology, clinical manifestations and dietary treatment of the disease are discussed. Prerequisites: NUSC 0650 or 0651.
FOSC 0661. FOOD INGREDIENT CHEMISTRY. 1st Semester. Lect. 3.	A study of the chemistry and function of carbohydrates, lipids, proteins, and food additives in food and their function in major food products, including bakery, dairy, and meat products is a major focus. The enhancement of food quality through formulation and processing modifications is also studied. Pre-requisites: CHEM 320 or 0360, CHEM 561, 562.
FOSC 0700. RESEARCH IN FOOD SCIENCE. 1st and 2nd Semesters, Summer.	1-6 credits. Research Problems. Hours and credits arranged.
NUSC 0700. RESEARCH IN NUTRITIONAL SCIENCE. 1st and 2nd Semesters, Summer.	1-6 credits. Research Problems. Hours and credits arranged.

FOSC 0752. CONTINUOUS REGISTRATION.	0 credit
NUSC 0752. CONTINUOUS REGISTRATION.	0 credit
FOSC 0754. CANDIDATE FOR DEGREE ONLY.	0 credit
NUSC 0754. CANDIDATE FOR DEGREE ONLY.	0 credit

Departmental Elective Courses			
FOSC	0507	Applied Food Microbiology	3 credits
FOSC	0571	Food Process Engineering Technology	4 credits
FOSC	0573	Product Research Innovation and Sensory Evaluation of Foods	4 credits
NUSC	0521	Maternal and Child Nutrition	3 credits
NUSC	0522	Advanced Community Nutrition	3 credits
NUSC	0580	International Nutrition Problems & Policies	3 credits
NUSC	0608	Recent National and International Development in Food & Nutritional Science	2 credits
1EDU	0506	Introduction to Research (2nd Semester)	3 credits
CHEM	0541	Instrumental Analysis (2nd Semester)	3 credits

List of Key graduate Faculty

Ralphenia D. Pace, Ph.D., R.D., L.D. gherdp@mytu.tuskegee.edu	Health and dietary factors, particularly the impact of fatty acids and functional foods on coronary heart disease and cancer
Adelia Bovell-Benjamin, Ph.D., CFS acbenjamin@mytu.tuskegee.edu	International nutrition; lipid oxidation; food product development with an emphasis on sensory sciences; storage stability; diet, cancer and nutritional issues among African Americans
Norma Dawkins, Ph.D. , CFS ndawkins@mytu.tuskegee.edu	Food product development of low fat, cholesterol containing foods and their relationship to the reduction of coronary heart disease, cancer and obesity Melissa Johnson, Ph.D. • Dietary, physiological, social, and cultural causes and consequences of CVD and other chronic diseases; chronic disease prevention and health promotion; health disparities
Byungjin (John) Min, Ph.D. minbj@mytu.tuskegee.edu	Food safety (i.e. microbial contaminations caused by foodborne pathogens); green packaging systems development - biodegradable resources, natural antimicrobials, functional plant ingredients
Melissa Johnson, PhD mjohnson@mytu.tuskegee.edu	Dietary, physiological, social, and cultural causes and consequences of CVD and other chronic diseases; chronic disease prevention and health promotion; health disparities
Angela Fells afells@mytu.tuskegee.edu	Administrative Assistant
Peter Gichuhi pgichuhi@mytu.tuskegee.edu	Research Associate

For more information, please visit our Department of Food and Nutritional Sciences webpage:
http://www.tuskegee.edu/academics/colleges/caens/food_nutritional_sci.aspx