Food Science and Nutrition

College of Agricultural Sciences and Technology

Department of Food Science and Nutrition

James Farrar, *Interim Chair*

Deborah Russell, *Administrative Support Coordinator*

Family and Food Sciences Building, Room 119, M/S FF17

559.278.2164

http://cast.csufresno.edu/fsn/

B.S. in Food and Nutritional Sciences

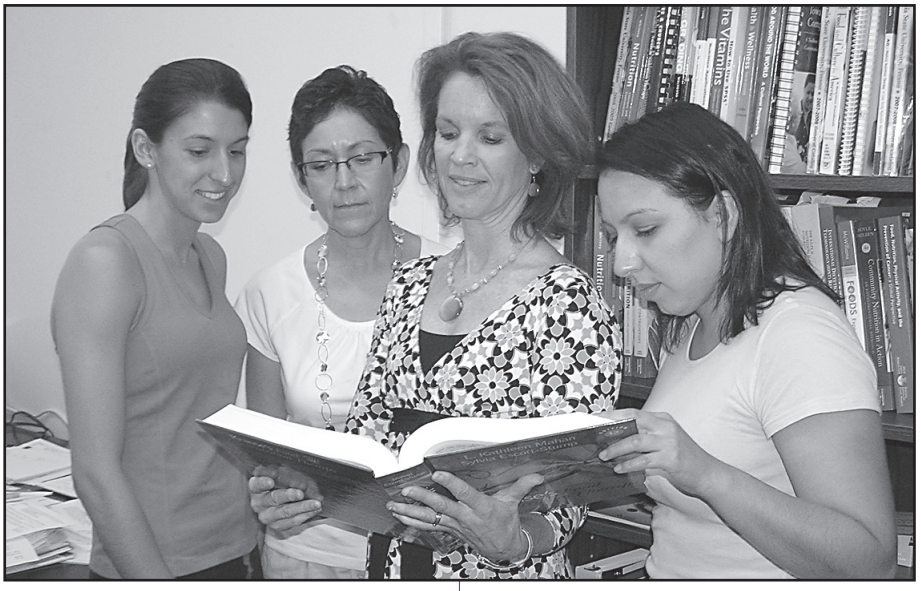
Options:

- Culinology®
- Dietetics and Food Administration
- Food Science

M.S. in Food and Nutritional Sciences

Minor in Food and Nutritional Sciences

Certificate of Advanced Study in Dietetics (Dietetic Internship)



Food Science and Nutrition

Join the leader in science, technology, and management. Students majoring within the Department of Food Science and Nutrition are prepared for a wide range of professions in the food industry — the largest single industry in the United States. California State University, Fresno is centered in the greatest food production and processing area in the world.

Some of the largest and best dairy and food companies cooperate with the university to provide students with a view of commercial realities in this industry. There is strong demand for dietitians and nutritionists by the health care and food service industries.

Instructional Facilities

The department facilities include the Dairy Processing Plant, Food Processing Research Laboratory, the Food Preparation and Product Development Laboratories, Food Science Analytical Laboratory, Food Sensory Laboratory, and the Computer Laboratory. These facilities are used by students and faculty to provide a practical education founded on science and technology.

Career Opportunities

Graduates of the Department of Food Science and Nutrition have enjoyed outstanding employment opportunities in the food industry. Historically, graduates have been placed in challenging positions with salary advancement and professional prestige envied by other industries throughout the world. The following options are available:

Culinology® is the blending of culinary arts and the science of food. The discipline consists of chefs and food scientists working in research and development (its primary focus), food manufacturing, chain restaurants, hotels, ingredient supply houses, consulting, and academia. It includes other food professionals in sales, marketing, manufacturing, distribution, and the media. The professional organization of the discipline is the Research Chefs Association (*http://www.culinology.org*). The group was formed in 1996 by a group of food professionals with a common interest in the challenges facing the profession. It has become the premier source of culinary and technical information for the food industry.

Dietetics and Food Administration. Graduates are prepared for challenging and rewarding employment in dietetics, nutrition, and food service. Employment is available in hospital dietetics, nutrition consulting, school and community nutrition, education, commercial and institutional food services.

This program is accredited by the Commission on Accreditation for Dietetics Education of the American Dietetic Association. The American Dietetic Association can be reached at 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995 or at 312. 899.0040 ext. 5400. By completing the requirements for this option, students meet the American Dietetic Association didactic requirements for dietetic registration and are eligible to apply to a dietetic internship. To become a registered dietitian, graduates of this program must also complete a dietetic internship and pass the dietetic registration examination.

Food Science. Graduates are prepared for an endless variety of employment opportunities in the food industry, including laboratory, processing, production, and governmental roles. New product development, marketing, management, distribution, and field service opportunities are present in many scientific, technological, and business endeavors. Located in the center of the world's most productive food processing region, the Fresno State Food Science Program is ideally suited to provide students with both a strong academic and practical education in food science. Students can gain practical experience by working in the Dairy Processing Enterprise and the Food Processing Enterprise, or research experience through the Center for Food Science and Nutrition Research. Students can also participate in internships, projects, supervised work experience, and

cooperative research. This program is approved by the Institute of Food Technologists (IFT). Information on careers in food science and IFT contacts can be obtained at *www.ift.org*.

Faculty

The faculty members continue to be recognized for quality hands-on education as well as scholarly contributions to their academic disciplines. Each student is assigned to a faculty adviser to maximize the student's educational experience at California State University, Fresno. The faculty are noted for cooperation and activity within each industry to prepare and place graduates in their chosen career.

James Farrar, *Interim Chair*
Gour Choudhury, *Center for Food Science and Nutrition Research Director*
Erin S. Dormedy, *Food Science Program Director*
Erin S. Dormedy, *Graduate Program Coordinator*
Dennis Ferris
Lisa Herzig, *Dietetics and Food Administration Program Director*
Mollie Smith, *Dietetic Internship Director*
Klaus Tenbergen, *Culinology® Program Director*

Bachelor of Science Degree Requirements

Food and Nutritional Sciences Major — *Units*

Major requirements 42-54

Options (select one)

Culinology 54
CULG 50, 55, 152; FSC 1, 41, 100, 112, 120, 125, 151, 178, 193 (3 units), 199; FSM 60, 131, 133, 134, 193 (3 units); NUTR 54

Dietetics and Food Administration 47
CULG 50, 152; FSC 1, 112, 199; FSM 60, 131, 133, 134; NUTR 54, 61, 149, 153, 156, 157, 160, 166

Food Science 42
FSC 1, 41, 100, 112, 115, 120, 125, 141, 142, 144, 178, 199; NUTR 54

Additional requirements 15-27

Culinology ..... (15)*
CHEM 1A, 8, 150; BIOL 20; MATH 11

Dietetics and Food Administration ..... (22)**
CHEM 3A, 8, 150; BIOL 20; BIOL 65; PSYCH 10; COUN 174; approved statistics course

Food Science ..... (27)***
CHEM 1A, 1B, 8, 150; MATH 11, 75; BIOL 20; PHYS 2A; 2 units of approved elective

General Education requirements..... 51
(Includes 12 upper-division units, to be taken no sooner than the term in which 60 units of coursework are completed.)

Total units 120

* This total indicates that 3 units for CHEM 1A are being used to satisfy the General Education requirement of 51 units.

** This total indicates that 6 units for CHEM 3A and PSYCH 10 are being used to satisfy the General Education requirement of 51 units.

*** This total indicates that 6 units for MATH 75 and PHYS 2A or CHEM 1A are being used to satisfy the General Education requirement of 51 units.

Advising Notes

1. Students should contact the program coordinator to schedule an academic advising appointment each semester. Since many courses are sequential in nature, it is important for new, transfer, or returning students to contact the program coordinator one semester prior to intended enrollment.
2. *CR/NC* grading is not permitted for courses included in the major and additional requirements, except work experience (FSC 193; FSM 193; and NUTR 193).
3. Grade Policy — all courses listed under major and additional requirements require a grade of *C* or better.
4. General Education courses designated as required by the department are prerequisite to many courses in the program of study.
5. The upper-division writing skills requirement can be met by passing the university upper-division writing examination or by passing an approved upper-division writing skills course. One unit of credit (in ENGL 100W) may be earned for passing the examination if requested by the student; by obtaining a letter grade of *C* or higher in an approved course (e.g., PLANT 110W) the student meets the university writing skills requirement.

Food and Nutritional Sciences Minor

The Minor in Food and Nutritional Sciences consists of 21 units, of which 9 must be upper-division. All courses must be selected in consultation with the department chair. The minor program must be certified by the department chair. The certified minor program will be filed with the Office of Evaluations.

Note: The Food and Nutritional Sciences Minor also requires a 2.0 GPA and 6 upper-division units in residence.

Graduate Programs

The Master of Science in Food and Nutritional Sciences is a 30-unit degree program designed to provide the student with professional competence in the technology and science of food and nutrition-related disciplines: food science and nutrition.

Full-time graduate students may earn the degree within two years when working closely with an adviser. To accommodate part-time students, graduate courses are offered in the late afternoon or evenings.

Admission Materials. To be considered for admission to the graduate program, the candidate must submit the following materials: evidence of a baccalaureate degree in food science, nutrition, agricultural chemistry, or a related area from an accredited institution; official transcripts of all college work; official scores from the Graduate Record Examination Aptitude Test (GRE); a university application; three letters of reference from employers or faculty at the university most recently attended; and a statement of 500 words or less indicating reasons for pursuing a master's degree.

Admission Criteria. Candidates for admission will be evaluated using the following criteria: undergraduate coursework; grade point average of 3.0 or better (last 60 semester units); GRE scores (480V/580Q equivalent to the 50th percentile), 500-word or less statement of professional goals; and letters of reference. Admission by the university does not imply acceptance in the Master of Science in Food and Nutritional Sciences program. Applicants whose preparatory education was in a language other than English must earn a minimum TOEFL score of 550 and a minimum score of 4 on the Test of Written English (TWE).

Classified standing will be granted to students who meet all of the admission criteria.

Conditional classified standing may be granted to applicants with a 2.75 to 2.99 GPA (last 60 semester units) and/or those required to complete prerequisite coursework. Prerequisite coursework is not included in the 30-unit master's program. Students must request classified standing in the program by the semester in which a minimum of 10 units to be used toward the degree are completed.

Master of Science Program

Food and Nutritional Sciences

Mission. The Master of Science in Food and Nutritional Sciences at California State University, Fresno provides for development of advanced level knowledge, development of research abilities, and the mentoring of future leaders.

Outcomes. The program graduates will be able to (a) use knowledge and critical thinking skills to identify innovative solutions to problems, (b) communicate research findings through professional presentations and publications, (c) advance their careers, and (d) take an active role in their profession.

This program provides a graduate-level proficiency in food science or nutrition. The degree is applicable to specializations in food research, production, processing, chemistry, and microbiology and dietetics, nutrition, nutrition education, and food service systems management.

Prerequisite Courses. The Master of Science in Food and Nutritional Sciences assumes preparation equivalent to a California State University, Fresno undergraduate major in food science, dairy science, nutrition, dietetics and food administration, or related areas.

Students with undergraduate degrees in other fields or from other institutions who need to make up course deficiencies should consult with the graduate coordinator. The following specific prerequisite foundation courses, or their equivalents, are required:

Food Science: FSC 112, 115, 125, 141, 144; NUTR 54

Nutrition/Dietetics: CULG 152 and NUTR 54, 147, 149, 153, 160, or completion of an ADA-accredited didactic program in dietetics as evidenced by a signed verification statement.

Program Requirements

All students must complete a 12-unit common core. Under the direction of the graduate adviser, students may focus a program in a specialized area to meet their career goals. This is accomplished by the selection of a minimum of 12 units of electives. A 6-unit thesis completes the program of study. A minimum of 21 units must be taken at the 200 level.

	Units
Core	
FN 200	**3**
200-level statistics course (See *Graduate Advising Notes*.)	**3**
FN 223	**3**
FN 229	**1+1+1**
Approved Electives	
200- or 100-level courses appropriate to individually designed program; must be approved by adviser prior to enrollment	**12**
Culminating Experience	
FN 299	**6**
Total minimum	**30**

Advising Notes for M.S. in Food and Nutritional Sciences

1. Several of the 200-level and approved elective courses have prerequisites other than courses listed as admission requirements.
2. The statistics requirement may be met with any adviser approved 200-level statistics course offered by the university.
3. Students should request specific information concerning the master of science degree and the program advising sheet from the department office.
4. Upon admission, students should see the department graduate program coordinator for assistance in selection of a graduate adviser.
5. To progress through the graduate program, the student must:
   a. Maintain a minimum of 3.0 GPA
   b. Complete all prerequisite coursework
   c. Attain classified standing
   d. Meet the graduate writing proficiency requirement
   e. File for advancement to candidacy
   f. Complete the program requirements
   g. File a master thesis committee assignment form
   h. Formally present and defend the thesis results
6. The Graduate Writing Skills requirement for the graduate program in Food and Nutritional Sciences may be met by passing the writing component of AGRI 220 or FN 200. Please see the program's graduate adviser for more information.
7. Advancement to candidacy requires the completion of 9 program units in residence, a minimum GPA of 3.0, meeting the graduate writing proficiency requirement, and filing a petition for advancement to candidacy a minimum of one semester prior to enrollment in thesis and within the deadline.
8. Students may apply a maximum of 3 units each of FN 290 or 292 to their program.
9. See *Division of Graduate Studies* in this catalog for university requirements.

Certificate of Advanced Study in Dietetics (Dietetic Internship)

The Certificate of Advanced Study in Dietetics is a postbaccalaureate professional program that meets the requirements for supervised practice experience for entry-level generalist dietitians. The Commission on Accreditation for Dietetics Education of the American Dietetic Association has granted accreditation to the program as a dietetic internship. The American Dietetic Association can be reached at 120 South Riverside Plaza, Suite 2000, Chicago, IL 60606-6995 or at 312.899.0040 ext. 5400. Students completing the program will be eligible to take the dietetic registration exam administered by the Commission on Dietetic Registration of the American Dietetic Association.

Admission Requirements. Candidates for admission will be evaluated using the following criteria: undergraduate coursework, grade point average of 3.0 or better (last 60 semester units/90 quarter units), completion of an accredited/approved didactic program in dietetics within the last five years, GRE scores (480V/580Q recommended), statement of professional goals, and letters of reference. Preference is given to those applicants with work or volunteer experience in dietetics. Applicants whose native language is other than English must earn a minimum TOEFL score of 550.

Note: Interns accepted to the program must successfully complete background checks, fingerprinting, and any other requirements of sponsoring facilities before beginning program.

Admission Materials. Prospective students must submit an application to the university for postbaccalaureate standing, evidence of an acceptable baccalaureate degree from an accredited institution, two official transcripts of all college work, official report of GRE scores, an application to the dietetic internship, three letters of reference from employers or faculty, statement of professional goals, and a verification statement or declaration of intent from a didactic program in dietetics. Applicants must also apply to D & D Digital Systems for enrollment in the computer matching process. For more information on computer matching, contact D & D Digital Systems at 515.292.0490.

Program Requirements

	Units
FN 250	**3**
FN 229	**1+1**
FN 230	**3**
NUTR 193	**4**
FSM 193	**4**
Total units	**16**

COURSES

Note: Active immunization against tetanus (available through Student Health Services) is a prerequisite for registration in any laboratory course in agriculture and for any student employment on the University Farm.

Culinology (CULG)

CULG 50. Food and Culinary Science I (3)
Introduction to high quality food. Emphasis on principles of food safety, nutrition, food preparation, and sensory evaluation. (2 lecture, 2 lab hours) **FS** (Formerly FSC 50)

CULG 55. Food and Culinary Science II (3)
Prerequisite: CULG 50. Advanced preparation of high-quality food. Includes wine and food pairing, nouvelle cuisine, advanced plate presentation, advanced knife and culinary skills, and professional methods of production. Also includes advanced knife and culinary skills including gardemanger, charcuterie, and advanced cooking techniques. (2 lecture, 3 lab hours) **3RD** (Formerly FSC 55)

CULG 152. Techniques for Healthful Cooking (3)
Prerequisites: CULG 50; NUTR 53 or 54 or permission of instructor; computer competency recommended. Planning a nutritious diet implementing the Dietary Guidelines for Americans. Cooking principles, recipe modification, and food selection at supermarkets and restaurants to increase dietary complex carbohydrates and decrease fat, sugar, and sodium. (2 lecture, 2 lab hours) **S** (Formerly FSC 152)

Food Science (FSC)

FSC 1. Introduction to Food Science and Technology (3)
Survey of specific types of industries, chemical composition, microbiological concerns, processing, and environmental risks and their control to ensure food quality and safety. Introduction to governmental regulation. Current issues in the food industry. **FS**

FSC 41. Introduction to Food and Dairy Processing (2)
Prerequisite: FSC 1. Introduction to the technology of processing foods, including dairy products, with special reference to unit operations and sanitation. Laboratory includes computer applications related to food technology. (1 lecture, 3 lab hours) (Field trips) **3RD**

FSC 100. Sensory Evaluation (3)
Prerequisite: MATH 11. Analysis, measurement, and methods used in sensory evaluation of foods. (2 lecture, 3 lab hours) **3RD**

FSC 112. Food and Dairy Chemistry (4)
Prerequisites: CHEM 150; FSC 1. Study of the functional properties of water, dispersed systems, carbohydrates, proteins, enzymes, lipids, and colligative properties with respect to their role in processing and shelf-life. Computer applications. (3 lecture, 3 lab hours) **S**

FSC 115. Food Analysis (4)
Prerequisites: FSC 41 or 112; MATH 11; or permission of instructor. Application of analytical techniques and instrumental methods used in the analysis of food composition. Laboratory analyses include proximate, fatty acids, °Brix, titratable acidity, mineral, peroxidase, peroxide values, reducing sugars, vitamins, and filth. (2 lecture, two 3-hour labs) **3RD**

FSC 120. Quality Assurance in the Food and Dairy Industry (4)
Prerequisites: FSC 1; FSC 178; CHEM 1A; BIOL 20; MATH 11; or permission of instructor. Physical, chemical, and microbiological methods for determining quality in food and dairy processing. Total Quality Management (TQM) and Statistical Quality Control (SQC) principles utilized. Food product standards and Hazard Analysis Critical Control Points (HACCP) guidelines and applications. Computer applications. (3 lecture, 3 lab hours) (Field trips) **3RD**

FSC 125. Food and Dairy Microbiology (4)
Prerequisites: FSC 41, 178; BIOL 20; or permission of instructor. Physical, chemical, and biological control of microorganisms in foods. Beneficial microorganisms used in food and dairy production. Laboratory emphasis on microbiological methods used in examining foods. Computer applications. (2 lectures, two 3-hour labs) (Field trips) **3RD**

FSC 141. Fruit/Vegetable Processing and Waste Management (4)
Prerequisites: CHEM 8; FSC 41, 178; MATH 75; PHYS 2A; BIOL 20. Characteristics of raw fruits and vegetables. Application of storage and thermal dehydration, refrigeration/freezing, waste management, and packaging principles that influence quality. Computer applications. (3 lecture, 3 lab hours) (Field trips) **3RD**

FSC 142. Dairy Processing (4)
Prerequisite: FSC 125; or permission of instructor. Unit operation approach to processing, including the three major steps of processing (raw material preparation, processing and packaging.) Overview of applied processing such as fluid milk, concentrated milks, cream, non-fat dried milk (NFDM) powder, ice cream, butter, and cheese. (2 lecture, two 3-hour labs) (Field trips) **3RD**

FSC 144. Food Engineering (4)
Prerequisites: FSC 41; PHYS 2A; MATH 75; or permission of instructor. The application of the engineering concepts and unit operations that include energy balance, heat transfer, fluid flow, thermodynamics, and mass transfer. (2 lectures, two 3-hour labs) (Field trips) **3RD**

FSC 151. Food Product Development (3)
Prerequisites: CULG 55; FSC 100, 112. Experimental approach to development of new food products. Explores both scientific and marketing parameters of product development. Includes concepts of traditional wine and food pairings, food styling and presentation, and other culinary techniques. (2 lecture, 3 lab hours) **3RD**

FSC 162T. Topics in Food Science (1-4; max total 12 if no topic repeated)
Prerequisites: FSC 41, CULG 50, NUTR 54. Topics relating to food science. Some topics may have labs. **FS**

FSC 178. Food Laws, Regulations, Inspection, and Grading (2)
Prerequisite: FSC 1. Federal and state laws and regulations pertaining to the food industry. Federal Register, Code of Federal Regulations, United States codes, California state codes, and other government documents as they pertain to the FDA, USDA, EPA, and other agencies. Grading and inspection of food products. (1 lecture, 2 activity hours) **3RD**

FSC 180. Undergraduate Research (1-4; max total 4)
Prerequisite: permission of instructor. Exploratory work on a suitable problem in food science. Approved for ***RP*** grading. **FS**

FSC 190. Independent Study (1-3; max total 6)
See *Academic Placement — Independent Study*. Approved for ***RP*** grading. **FS**

FSC 192. Readings and Conference (1-3; max total 3)
Prerequisite: permission of instructor. Individually directed readings; reports and evaluation. (Hours arranged) **FS**

FSC 193. Supervised Work Experience (1-6; max total 6)
Prerequisite: permission of instructor. Supervised work experience in food science. ***CR/NC*** grading only. **FS**

FSC 199. Senior Seminar (1)
Prerequisite: permission of instructor. Faculty, student, and industry presentations of current food science topics. Discussion of topics of practical importance to graduating students. **S**

Food Systems Management (FSM)

FSM 60. ServSafe (1)
Up-to-date information on all aspects of handling food, from receiving and storing to preparing and serving. **FS**

FSM 131. Introduction to Food Systems Management (3)
A managerial and systems approach to food service operations. Impact of legislation, labor relations, and marketing on industry. **S**

FSM 133. Quantity Food Production (3)
Prerequisites: FSM 60; FSM 131; CULG 50; health clearance and health and accident insurance required. Preparation and service in quantity foodservice operations including techniques for making stocks, soups, and sauces. Ethnic cooking. Menu planning, recipe standardization, equipment and layout, production controls, work simplification, and quality assurance. (2 lecture, 3 lab hours) **F**

FSM 134. Cost Analysis in Food Systems Management (3)
Prerequisites: FSM 133; computer competency recommended. Advanced concepts of planning, analyzing, decision-making and reporting procedures unique to food systems management. Cost analysis and control, computer applications, and purchasing in food service. (2 lecture, 2 lab hours) **S**

FSM 135. Institutional Experience (3)
Prerequisites: FSM 134 or permission of instructor; health clearance and health and accident insurance required. Supervised work experience in food systems management. (1 lecture, 4 lab hours) **FS**

FSM 162T. Topics in Food Systems Management (1-4; max total 12 if no topic repeated)
Prerequisites: CULG 50; FSM 131; NUTR 54. Topics relating to food systems management. **FS**

FSM 180. Undergraduate Research (1-4; max total 4)
Prerequisite: permission of instructor. Exploratory work on a suitable problem in food systems management. Approved for ***RP*** grading. **FS**

FSM 190. Independent Study (1-3; max total 6)
See *Academic Placement — Independent Study*. Approved for ***RP*** grading. **FS**

FSM 192. Readings and Conference (1-3; max total 3)
Prerequisite: permission of instructor. Individually directed readings; reports and evaluation. (Hours arranged) **FS**

FSM 193. Supervised Work Experience (1-6; max total 6)
Prerequisite: permission of instructor. Supervised work experience in food systems management. A health clearance may be required. ***CR/NC*** grading only. **FS**

Nutrition (NUTR)

NUTR 53. Nutrition and Health: Realities and Controversies (3)
Optimal nutrition to reduce the risk of cancer, heart disease, allergies, obesity, and other diseases. Social, psychological, and cultural dictates that affect food selection and health. Personal strategies to develop a nutrition plan for better health. G.E. Breadth E1. **FS**

NUTR 54. Elementary Nutrition (3)
Application of chemical and biological principles to carbohydrates, proteins, fats, vitamins, minerals and water in human nutrition; recommended nutrient allowances and dietary evaluation; determination of energy needs; and relationship of nutrition to health and disease. **FS**

NUTR 61. Introduction to the Profession of Dietetics (1)
Survey of food and nutrition services and programs. Identification of marketing and legislative issues in dietetics. (1 lecture) **FS** (Formerly NUTR 161)

NUTR 147. Nutrition and the Athlete (3)
Prerequisite: NUTR 53 or 54. Covers intermediate principles of nutrition and the application of these principles to diet and nutritional status. Looks at interactions among diet, nutritional status, training, response, adaptation, and performance. **FS**

NUTR 149. Food and Nutrition Communication (3)
Prerequisites: NUTR 156; computer competency recommended. Integrating and translating food and nutritional science concepts into easily understood consumer messages. Activities include developing an assortment of instructional materials using a variety of media, writing lesson plans, and making presentations to a target audience. (2 lecture, 2 lab hours) **S**

NUTR 153. Advanced Nutrition (3)
Prerequisites: NUTR 54, BIOL 65, and CHEM 150. Relationship of nutrients to maintenance of homeostasis. Factors affecting the nutrient demands with interpretation of biochemical indices. Structural and functional properties of nutrients. Gross and microscopic structures related to cell metabolism, digestion, bone mineralization and body composition. **S**

NUTR 156. Nutrition Assessment (3)
Prerequisites: NUTR 153 and COUN 174. Assessment of nutritional status emphasizing dietary evaluation, nutrition care planning, and intervention. Application of dietary standards and principles for disease prevention and control. Methods for monitoring quality of nutritional care requiring application of nutrition counseling skills. (2 lecture, 3 lab hours) **F**

NUTR 157. Medical Nutritional Therapy (4)
Prerequisite: NUTR 156. Advanced concepts of nutritional therapy in disease. Identification of goals of nutritional therapy, principles of dietary modification, and meal planning for specific conditions. Calculation of diet prescriptions and application of nutrition counseling skills for medical conditions. (3 lecture, 3 lab hours) **S**

NUTR 160. Nutrition across the Life Cycle (3)
Prerequisite: NUTR 54. The influence of nutrition on age, growth, and normal development. Nutrition recommendations from conception through late adulthood. Socioeconomic, cultural, and psychological factors influencing food and nutrition behavior. The role of exercise throughout the life cycle. **F**

NUTR 162T. Topics in Nutrition (1-4; max total 12 if no topic repeated)
Prerequisites: NUTR 54, 160. Topics relating to nutrition. Some topics may have labs. **FS**

NUTR 166. Community Nutrition (3)
Prerequisite: NUTR 160 or permission of instructor. Survey of nutrition programs created to improve community health. Development and examination of public health nutrition policy. Proposal writing. **S**

NUTR 180. Undergraduate Research (1-4; max total 4)
Prerequisite: permission of instructor. Exploratory work on a suitable problem in nutrition and dietetics. Approved for ***RP*** grading. **FS**

NUTR 190. Independent Study (1-3; max total 6)
See *Academic Placement — Independent Study*. Approved for ***RP*** grading. **FS**

NUTR 192. Readings and Conference (1-3; max total 3)
Prerequisite: permission of instructor. Individually directed readings; reports and evaluation. (Hours arranged) **FS**

NUTR 193. Supervised Work Experience (1-6; max total of 6)
Prerequisite: permission of instructor. Supervised work experience in dietetics and nutrition. ***CR/NC*** grading only. **FS**

GRADUATE COURSES

(See *Catalog Numbering System*.)

The following graduate courses are open to students who have been accepted into the graduate program. Students who are not in graduate standing should contact the department graduate coordinator prior to enrolling.

Food and Nutrition (FN)

FN 200. Research Methods in Food and Nutrition (3)
Prerequisite: permission of instructor. Quantitative and qualitative research design in food and nutritional sciences. Methods of data collection and analysis. Evaluation of research design and outcomes. Reporting research results. Students will develop a research proposal. **F**

FN 221T. Topics in Food Science and Nutrition (3; max total 9)
Prerequisites: upper-division food science and nutrition course appropriate to study topic; permission of instructor. Advanced studies in a given area of food science and nutrition. Some topics may require lab hours. **FS**

FN 223. Food, Nutrition, and Health (3)
Prerequisite: CHEM 150. Review and discussion of the recent scientific literature relating to food consumption, nutrient intake, and human health. **F**

FN 229. Seminar (1; required total 3)
Prerequisite: permission of instructor. Students investigate and present current research problems. Observation and evaluation of additional assigned seminars. Oral and written reports required. **FS**

FN 230. Advanced Nutrition Counseling (3)
Prerequisite: NUTR 157. Advanced counseling techniques including learning and behavioral theories and principals of goal setting. Design, delivery, and evaluation of nutrition counseling. Development and evaluation of nutrition education materials. Role-playing and case studies assigned. **F**

FN 250. Food and Nutrition Resource Management (3)
Examines management resources (human, financial, and physical) in a variety of industry and practice settings related to foods and nutrition. Development of a business and marketing plan. Group projects, case studies, and selected topics from current literature. (Formerly FN 221T)

FN 290. Independent Study (1-3; max total 3)
See *Academic Placement — Independent Study*. Approved for ***RP*** grading. **FS**

FN 292. Readings in Food Science and Nutrition (1-3; max total 3)
Prerequisite: permission of instructor. Individually directed readings in a field of special concern to students in the graduate program; appropriate reports and evaluations required; individual conferences, no formal class meetings. Approved for ***RP*** grading. **FS**

FN 299. Thesis (2-6; max total 6)
Prerequisite: prior advancement to candidacy. See *Criteria for Thesis and Project*. Preparation, completion, and submission of an acceptable thesis for the master's degree. Approved for ***RP*** grading. **FS**