

## 2011-13 Cal Poly Catalog

### Food Science and Nutrition Department

#### FSN—FOOD SCIENCE AND NUTRITION

##### FSN 101 Orientation to the Food Science and Nutrition Majors (1) (CR/NC)

Understanding the depth and breadth of the Food Science and Nutrition programs. Emphasis on academic and career planning. Students are required to complete this course within their first year in the major. Separate sections will be offered for each major. Credit/No Credit grading only. 1 lecture.

##### FSN 121 Fundamentals of Food (4)

Theoretical aspects and practical applications of the principles of culinary science and food preparation. 3 lectures, 1 laboratory.

##### FSN 125 Introduction to Food Science (4)

Basic principles of food science. Chemical, physical, and microbiological properties of foods. Ingredient properties, preservation, and processing. Overview of the commercial food processing industry at state and national levels. 3 lectures, 1 laboratory.

##### FSN 200 Special Problems for Undergraduates (1–4)

Individual investigation, research studies, or surveys of selected problems. Total credit limited to 6 units, with a maximum of 4 units per quarter. Prerequisite: Consent of instructor.

##### FSN 201 Enterprise Project (1–4) (CR/NC)

Post-harvest processing of a high quality food product. Project participation is voluntary and subject to approval by the department head and the Cal Poly Corporation. Total degree credit for FSN 201 and FSN 401 combined limited to 12 units. Credit/No Credit grading only. Prerequisite: FSN 125 or FSN 230 or FSN 121 and consent of instructor.

##### FSN 204 Food Processing Operations (4)

Applied food manufacturing and processing technology emphasizing unit operations. Water removal in foods (dehydration, spray drying, vacuum concentration), heat removal (refrigeration, freezing), and osmotic preservation. Students produce processed foods in a pilot plant. 3 lectures, 1 laboratory. Prerequisite: FSN 125 or FSN 230.

##### FSN 210 Nutrition (4)

GE B5

Introduction to the science of human nutrition. Nutrient structure, metabolism, and function in body systems. Application of nutrition science principles to promote optimal health. 4 lectures. Fulfills GE B5.

##### FSN 230 Elements of Food Processing (4)

Principles of food processing operations covering thermal processing, freezing, dehydration, fermentation and raw material handling. Overview of food technology, food quality, spoilage, packaging and label requirements. For non-Food Science majors only. Field trip may be required. 3 lectures, 1 laboratory.

##### FSN 244 Cereal and Bakery Science (4)

Applied science of cereal-based products. Theory and practice underlying preparation of doughs, batters, fillings, and glazes. Chemistry of baking doughs and batters and storage of finished products. Marketing and product development of breads, cakes, cookies, and pastries. Comparative nutritional evaluation of flours, grains, and finished products. 3 lectures, 1 laboratory. Prerequisite: FSN 125 or FSN 230.

##### FSN 250 Food and Nutrition: Customs and Culture (4) GE D4 USCP

Anthropological perspective of traditional and contemporary food customs and culture. Major emphasis on U.S. cultures including Native American, Hispanic American, African American, and Asian American. Past and future developments in organic foods, junk foods and industrial foods. 4 lectures. Fulfills GE D4 and USCP.

##### FSN 264 Survey of Food Chemistry (4)

Basic application of chemistry to food products. Role of chemical components of food and beverage formulations with focus on grape, wine, fermented and distilled products as well as fruit, vegetable and cereal products. 4 lectures. Prerequisite: CHEM 111 or equivalent.

##### FSN 270 Food and Wine Plant Sanitation (4)

Operational management of a food and wine plant sanitation program. Chemical and physical control of insects, rodents, and birds. Microbial sanitation opera-

tions. Government and legal issues affecting operations. Chemistry of detergents, surfactants and sanitizers. Design and construction of plants. Certified organic USDA requirements. 4 lectures. Prerequisite: FSN 125 or FSN 230.

##### FSN 275 Principles of Food Safety and Hazard Analysis (4)

Chemical, microbiological, and physical aspects of food safety are addressed especially with regard to establishment of safety programs for the food industry. In-depth coverage of hazard analysis and critical control points (HACCP). 3 lectures, 1 activity. Prerequisite: FSN 125 or FSN 230, and MCRO 221 or MCRO 224; or consent of instructor.

##### FSN 285 Certified Organic Food Processing Operations (4)

Certification and legal requirements for the processing of fruit, vegetable, wine, cereal, beer, distilled spirits and muscle foods according to USDA, EU and JAS requirements. Basic principles of certified organic handling, process operations, ingredient sourcing and product development. 4 lectures. Prerequisite: FSN 125, FSN 230 or consent of instructor.

##### FSN 290 Selected Topics (1–4)

Directed group study of selected topics. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1 to 4 lectures. Prerequisite: Open to undergraduate students and consent of instructor.

##### FSN 304 Advanced Culinary Principles and Practice (4)

Chemistry of starch, fat and proteins and its impact on texture, taste, flavor and appearance of food. Effects of microorganisms on changes of food during preparation and storage. Strong emphasis on baking technology. 3 lectures, 1 laboratory. Prerequisite: FSN 121 and CHEM 127.

##### FSN 310 Maternal and Child Nutrition (4)

Nutritional needs and issues of women and children, including fertility, pregnancy and lactation; physical, nutritional, social growth and development from infancy through adolescence. Current nutrition issues in maternal and child nutrition. 4 lectures. Prerequisite: FSN 210; junior standing.

##### FSN 311 Sensory Evaluation of Food (4)

Designed to help the food scientist solve typical sensory problems occurring in the food industry by using simple difference and scaling test designs; select appropriate panelists for specific sensory tests; and conduct such tests, analyze, interpret the results and write a report. 3 lectures, 1 laboratory. Prerequisite: STAT 218; FSN 125 or FSN 230.

##### FSN 315 Nutrition in Aging (4)

Nutrition issues in the middle and later years. Changes in organ systems, nutrient needs, functional status, and food preferences as adults age. Nutrition and chronic disease. Nutritional assessment and screening. Nutrition-related health care and social services. 4 lectures. Prerequisite: FSN 210; ~~sophomore junior standing~~. *Change effective Fall 2012.*

##### FSN 319 Food Technology for the Consumer (4)

GE Area F

Overview of the science and technology used to produce the foods consumed on a daily basis. Food science, biotechnology, food law, processing, preservation, ingredient functionality, package label information, and food safety information. 4 lectures. Prerequisite: Junior standing and completion of GE Area B. Fulfills GE Area F.

##### FSN 321 Culinary Management: Principles and Practice (4)

Principles involved in the choice, purchase, and preparation of foods in a variety of settings. Application of culinary management principles in the use of time, energy and money. Planning, preparing, and serving meals with emphasis on nutritional, aesthetic, economic and cultural aspects of food. 3 lectures, 1 laboratory. Prerequisite: FSN 121, FSN 210, sophomore standing.

##### FSN 322 French Food in French (4)

Blend of French language, culture, food preparation techniques, and basic food chemistry and nutrition. Total immersion in language and cooking: preparation of French food while interacting in French with classmates and instructors in lectures, discussion, and laboratory. 3 lectures, 1 laboratory. Prerequisite: FR 103 or consent of instructor. *Crosslisted as FR/FSN 322.*

##### FSN 328 Nutrient Metabolism I (4)

Metabolism of carbohydrates, fats and proteins as it applies to human nutrition. Integration of metabolic pathways. 4 lectures. Prerequisite: FSN 210, CHEM 313/371, BIO 111/161, junior standing.

**FSN 329 Nutrient Metabolism II (4)**

Continuation of FSN 328. Biochemical, molecular, and physiological functions of vitamins and minerals and their interaction with other nutrients. 3 lectures, 1 laboratory. Prerequisite: FSN 328.

**FSN 330 Introduction to Principles of Food Engineering (4)**

Introduction to principles of food engineering and basic calculations needed for food plant operations. Unit conversions, material balance, heat balance, steam heating, psychrometry, vacuum and pressure. Field trip may be required. 3 lectures, 1 laboratory. Prerequisite: FSN 125; MATH 118 or equivalent; and PHYS 121.

**FSN 334 Food Packaging (3)**

Function of food packaging in food processing and preservation. Packaging materials and forms. Regulations and testing of food packaging material. Oral presentation required. 3 lectures. Prerequisite: FSN 125 and FSN 204.

**FSN 335 Food Quality Assurance (4)**

Chemical, microbiological, and physical methods of analyses of foods used in food quality assurance and product development laboratories. Organization and management of quality assurance programs utilizing basic statistical control. Development of food production standards and interpretation of specifications. Packaging and container evaluation. 3 lectures, 1 laboratory. Prerequisite: FSN 125 or FSN 230; junior standing.

**FSN 341 Wines and Fermented Foods (4)**

Processing, manufacturing, historical and bio-technical applications of fermentation technology for the production of food products focusing on wine. Wines of the world, distilled beverages, beers, fermented dairy, vegetable and meat products important to the post-harvest economy of California. 4 lectures. Prerequisite: Junior standing and completion of GE Area B.

**FSN 343 Institutional Foodservice I (3)**

Principles of equipment selection and floor planning with emphasis on sanitation and safety. 2 lectures, 1 laboratory. Prerequisite: FSN 121 and junior standing.

**FSN 344 Institutional Foodservice II (4)**

Economic principles and problems involved in planning and preparing food using institutional equipment to meet specific product standards for large groups. 3 lectures, 1 laboratory. Prerequisite: FSN 321, FSN 343.

**FSN 354 Packaging Function in Food Processing (3)**

Basic food spoilage and preservation mechanisms. The role of food packaging in food processing. Package and food compatibility. For non-Food Science majors. 3 lectures. Prerequisite: Junior standing.

**FSN 364 Food Chemistry (4)**

Chemical and biochemical properties of food components. Basic principles of food enzymology and the chemical and biochemical changes occurring in food systems as a function of different food processing conditions. Mechanisms of reactions affecting food quality and nutritional value. Laboratory focus on assessment of food chemical systems. 3 lectures, 1 laboratory. Prerequisite: FSN 125 or FSN 230, CHEM 313.

**FSN 368 Food Analysis (4)**

Principles of chemical and biochemical methods and techniques for measuring food protein, carbohydrates, lipids, water, vitamins, minerals and other components of foods, wine analysis. Application of AOAC approved methods for determining nutrients as they relate to nutritional labeling legal requirements. 3 lectures, 1 laboratory. Prerequisite: FSN 364.

**FSN 374 Food Laws and Regulations (4)**

Federal, state, and local laws and regulations affecting the production, processing, packaging, marketing, and distribution of food. Emphasis on FDA, USDA and California codes. 4 lectures. Prerequisite: FSN 125 or FSN 230 or WVIT 102. ~~and junior standing.~~ *Change effective Fall 2012.*

**FSN 400 Special Problems for Advanced Undergraduates (1-4)**

Individual investigation, research, studies, or surveys of selected problems. Total credit limited to 6 units, with a maximum of 4 units per quarter. Prerequisite: Consent of instructor.

**FSN 401 Advanced Enterprise Project (1-4)**

Leadership responsibility on enterprise projects. Lead students, under the supervision of instructor, will be accountable for all phases of the project: scheduling times, securing raw product, record keeping, and marketing of the product. Total degree credit for FSN 201 and FSN 401 combined limited to 12 units. Prerequisite: FSN 201 and junior standing and consent of instructor.

**FSN 408 Food Composition Science and Product Development (4)**

Chemical and physical properties of food ingredients. Functionality of water, carbohydrates, proteins, lipids, additives and other food ingredients used in the formulation, development, and processing of foods. Product development processes from idea generation to marketing. 3 lectures, 1 laboratory. Prerequisite: FSN 311; FSN 364; CHEM 313; and senior standing.

**FSN 410 Nutritional Implications of Food Industry Practices (4)**

Methods for assessing nutritional quality of foods/diets. Nutrient databases for raw and processed foods. Effects of food industry practices (e.g., processing, fortification, new product development, biotechnology) on nutritional quality of foods/diets. Evolution of public policy. 4 seminars. Prerequisite: FSN 210; FSN 125 or FSN 230; and ~~senior~~ junior standing. *Change effective Fall 2012.*

**FSN 415 Nutrition Education and Communications (4)**

Application of appropriate behavior and learning theories in nutrition education and communications across diverse population groups. Effective use of techniques, materials, and computer-based technology to enhance communications. Includes community-based learning projects. 4 lectures. Prerequisite: FSN 329-328 and senior standing. *Change effective Fall 2012.*

**FSN 416 Community Nutrition (4)**

Federal, state and local nutrition assessment activities and program services for at-risk populations. Emphasis on health promotion and disease prevention concepts. Develop skills in assessing community nutrition problems and planning service interventions. 4 lectures. Prerequisite: FSN 328; senior standing. Recommended: FSN 310, FSN 315 and FSN 415.

**FSN 417 Nutrition Counseling (4)**

Communication, behavioral, and counseling theories as they relate to nutrition counseling. Emphasis on development of skills to promote healthy eating behaviors. Examination of eating disorders and obesity, including preventative and therapeutic interventions. 4 lectures. Prerequisite: Senior standing, PSY 201/202. Corequisite: FSN 415.

**FSN 420 Critical Evaluation of Nutrition Research (4)**

Nutrition research terminology and methods, including the strengths and weaknesses of *in vitro*, animal, human observational, and human intervention studies. Critical evaluation and interpretation of nutrition research. Case studies of research supporting or refuting diet/health links. 4 seminars. Prerequisite: FSN 329; STAT 218; and senior standing.

**FSN 426 Food Systems Management (4)**

Principles of successful organization and management with their application to the effective operation of food service. Administrative responsibilities of the food service manager. Management theories and practice. Labor relations. Discipline and performance appraisal. 4 lectures. Prerequisite: FSN 344.

**FSN 429 Clinical Nutrition I (4)**

Application of the nutritional care process to physiological disorders which may alter nutritional requirements or require dietary modifications. Anthropometric, biochemical, clinical, and dietary assessment. GI disorders, diabetes mellitus, electrolytes, acid-base balance, hydration and enteral and parenteral nutrition. 3 lectures, 1 laboratory. Prerequisite: ZOO 331, 332 (*transfer equivalent ZOO 231, 232*) and senior standing. Prerequisite or concurrent: FSN 329.

**FSN 430 Clinical Nutrition II (4)**

Application of the nutritional care process to physiological and metabolic disorders which may alter nutritional requirements or require dietary modifications. Respiratory diseases, burns, cancer, inborn errors of metabolism, pregnancy, cardiovascular disease, liver disease, AIDS, renal disease, and bariatric surgery. 3 lectures, 1 laboratory. Prerequisite: FSN 429.

**FSN 440 Internship in Food Science or Nutrition (1-12)**

Career experience with private or public agencies. Total credit limited to 12 units. Maximum of 6 units may be applied toward degree requirements. Prerequisite: Junior standing and consent of instructor.

**FSN 444 Engineering Concepts in Food Processing (4)**

Engineering concepts relevant to food processing. Heat transfer, evaporation, dehydration and refrigeration calculation principles. 4 lectures. Prerequisite: FSN 330, FSN 204; FSN 230 for non-Food Science majors.

**FSN 461, 462 Senior Project I, II (3) (3)**

Selection of scientific research topic in major area. Development of literature review, research questions in Senior Project I. Research design, data collection, and analysis in Senior Project II. Project requires a formal report which must follow departmental guidelines. Minimum of 90 hours per quarter. **FSN 461**

prerequisite: For FDSC and NUTR majors: Completion of GE A3, STAT 218, and senior standing. Also corequisite for NUTR majors: FSN 329; recommended: FSN 420. Prerequisite for WVIT majors (enology concentration): Junior standing and consent of instructor. **FSN 462** prerequisite: FSN 461.

**FSN 470 Selected Advanced Topics (1–4)**

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1–4 lectures. Prerequisite: Senior standing.

**FSN 471 Selected Advanced Laboratory (1–4)**

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1–4 laboratories. Prerequisite: Senior standing.

**FSN 474 Advanced Food Processing (4)**

Advanced topics in processing operations with emphasis on thermal processing. Non-traditional processing technology such as microwave, ionizing radiation, and Pascalization. Oral presentation required. 3 lectures, 1 laboratory. Prerequisite: FSN 444 and senior standing.

**FSN 480 Policy Arguments in Food and Nutrition (2)**

Analysis and evaluation of law and policy in foods, nutrition, and related healthcare issues. Planning and presentation of successful arguments supporting or refuting key food and health policies. Critical assessment of advocacy processes and determination of best approaches to achieving legislative and policy goals. 2 seminars. Prerequisite: **FSN-374**; junior standing **or consent of instructor**. *Change effective Fall 2012.*

**FSN 485 Cooperative Education Experience in Food Science and Nutrition (6) (CR/NC)**

Part-time work experience with an approved Food Science or Nutrition firm engaged in production or related business, industry or governmental agency. Positions are paid and usually require relocation and registration in course for two consecutive quarters. Formal report and evaluation by work supervisor required. Total credit limited to 12 units. Degree credit limited to 6 units. Credit/No Credit grading only. Prerequisite: Sophomore standing and consent of instructor.

**FSN 495 Cooperative Education Experience in Food Science and Nutrition (12) (CR/NC)**

Full time work experience with an approved Food Science or Nutrition firm engaged in production or related business, industry or governmental agency. Positions are paid and usually require relocation and registration in course for two consecutive quarters. Formal report and evaluation by work supervisor required. Total credit limited to 12 units. Degree credit limited to 6 units. Credit/No Credit grading only. Prerequisite: Sophomore standing and consent of instructor.

**FSN 500 Individual Study (1–6)**

Advanced independent study planned and completed under the direction of a member of the department faculty. Total credit limited to 6 units. Prerequisite: Graduate standing, consent of supervising faculty member and graduate advisor.

**FSN 501 Lipid Metabolism and Nutrition (3)**

Digestion, absorption and metabolism of lipids with emphasis on lipoprotein metabolism, regulation of lipid metabolism, essential fatty acid requirements and functions. 3 seminars. Prerequisite: Graduate standing or consent of instructor.

**FSN 540 Dietetic Internship Supervised Practice (10) (CR/NC)**

Supervised practice at various nutrition therapy, foodservice management, and community nutrition sites. Total credit limited to 30 units, with a maximum of 10 units per quarter. Credit/No Credit grading only. Prerequisite: Acceptance into the Cal Poly, San Luis Obispo Dietetic Internship, a special session program in Continuing Education.

**FSN 541 Dietetic Internship Seminar (2) (CR/NC)**

A forum for dietetic interns to make presentations and share their experiences in their supervised practice; guest presentations on current issues in nutrition and health. Total credit limited to 6 units. Credit/No Credit grading only. 2 seminars. Prerequisite: Acceptance into the Cal Poly, San Luis Obispo Dietetic Internship, a special session program in Continuing Education.

**FSN 542 Dietetic Internship: Current and Emerging Issues (2) (CR/NC)**

Presentation of various hot topics and emerging issues in nutrition therapy, foodservice management and community nutrition for enrichment of the internship experience. Credit/No Credit grading only. 2 lectures. Total credit

limited to 6 units, with a maximum of 2 units per quarter. Prerequisite: Acceptance into the Cal Poly, San Luis Obispo Dietetic Internship, a special session program in Continuing Education.

**FSN 570 Selected Topics in Food Science and Nutrition (1–4)**

Directed group study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 12 units. 1 to 4 seminars. Prerequisite: Graduate standing or consent of instructor.

**FSN 571 Selected Advanced Laboratory in Food Science and Nutrition (1–4)**

Directed group laboratory study of selected topics for advanced students. Open to undergraduate and graduate students. The Schedule of Classes will list title selected. Total credit limited to 8 units. 1–4 laboratories. Prerequisite: Consent of instructor.

**FSN 581 Graduate Seminar in Food Science and Nutrition (3)**

Current findings and research problems in the field and their application to food science and nutrition. The Schedule of Classes will list topic selected. Total credit limited to 6 units with approval of advisor. 3 seminars. Prerequisite: Graduate standing or consent of instructor.

**FSN 599 Thesis (1–6)**

Individual research in food science and nutrition under faculty supervision leading to a graduate thesis of suitable quality. Total credit limited to 6 units. Prerequisite: Graduate standing and consent of instructor.