

Unit Plan for Assessing and Improving Student Learning in Degree Programs

Unit: Department of Food Science and Human Nutrition

Unit Head approval: Yes

Date: 5/8/08

SECTION 1: PAST ASSESSMENT RESULTS

Brief description of changes or improvements made in your unit as the result of assessment results since 2000.

Under a previous administration, FSHN did not have an assessment plan on file with the campus in 1999. In fall 2007, we started the process of articulating student objectives for our five undergraduate concentrations as well as for our graduate program.

SECTION 2: REVISED ASSESSMENT PLAN

(a) **PROCESS**: Brief description of the process followed to develop or revise this assessment plan.

Focus groups of faculty members were appointed for each concentration. Student learning objectives were submitted by each group and discussed at a faculty meeting. Two of the undergraduate concentrations, Dietetics and Food Science, have curricula that are approved by professional associations (respectively, the Commission on Accreditation for Dietetics Education and the Institute of Food Technologists), and therefore are ahead of the other concentrations in terms of progress towards developing an assessment plan. We had a faculty retreat on April 11th that was facilitated by Dr. Neil Knobloch from Purdue University. At the retreat, two main activities were performed. First, faculty members reviewed the student learning objectives for the concentrations where their courses were required and rewrote some of the objectives to be consistent and at the same level of specificity. Faculty members then filled out curriculum maps for their individual courses (determining how well activities in their courses meet student learning objectives). Second, faculty members were divided into groups and asked to consider the five success skills that were common among the learning objectives of the five undergraduate concentrations and the graduate program. Faculty members were asked to discuss how they might address the success skills in their courses and to give examples whenever possible.

(b) **STUDENT OUTCOMES**: List Unit's student learning outcomes (knowledge, skills, and attitudes).

Success skills are listed here. Please see Appendices A-F for knowledge and skills outcomes for the five undergraduate concentrations. The knowledge and skills outcomes for the graduate concentrations are being developed.

SUCCESS SKILLS:

Learning objective	Examples
<ul style="list-style-type: none"> ● <i>Communication skills (i.e., oral and written communication, listening, interviewing, etc.)</i> 	<ul style="list-style-type: none"> ● <i>Demonstrate the use of oral and written communication skills. This includes such skills as writing technical reports, letters and memos; communicating technical information to a non-technical audience; and making formal and informal presentations.</i>
<ul style="list-style-type: none"> ● <i>Critical thinking/problem solving skills (i.e., creativity, common sense, resourcefulness, scientific reasoning, analytical thinking, etc.).</i> 	<ul style="list-style-type: none"> ● <i>Define a problem, identify potential causes and possible solutions, and make thoughtful recommendations.</i> ● <i>Apply critical thinking skills to new situations.</i>
<ul style="list-style-type: none"> ● <i>Professionalism skills (i.e., ethics, integrity, respect for diversity).</i> 	<ul style="list-style-type: none"> ● <i>Commit to the highest standards of professional integrity and ethical values.</i> ● <i>Work and/or interact with individuals from diverse cultures.</i>
<ul style="list-style-type: none"> ● <i>Interaction skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.)</i> 	<ul style="list-style-type: none"> ● <i>Work effectively with others.</i> ● <i>Provide leadership in a variety of situations.</i> ● <i>Deal with individual and/or group conflict.</i>
<ul style="list-style-type: none"> ● <i>Information acquisition skills (i.e., written and electronic searches, databases, Internet, etc.).</i> 	<ul style="list-style-type: none"> ● <i>Independently research scientific and non-scientific information.</i> ● <i>Completely use library resources.</i>

(c) MEASURES AND METHODS USED TO MEASURE OUTCOMES:

Current methods being used are the following.

Undergraduate programs (5 concentrations):

- (1) Student electronic survey by the College of ACES—tracks job placement and salaries*
- (2) Student electronic survey by FSHN was performed for about 3-4 consecutive years since 2002.*
- (3) Alumni survey online*
- (4) Informal feedback from internship supervisors to departmental advisors*
- (5) External review by departmental External Advisory Committee (EAC) annually. The EAC meets with a few undergraduates from each concentration during lunch. The EAC also receives updates on our instructional program during the meeting.*
- (6) Curriculum mapping (Food Science and Dietetics concentrations)*
- (7) Periodic review of instructional program in Food Science by the Institute of Food Technologists for approval*
- (8) Period review of instructional program in Dietetics by the Commission on Accreditation for Dietetics Education*

- (9) Capstone courses in Food Science (FSHN 466, Food Product Development), Food Industry and Business (FSHN 466), and Hospitality Management (FSHN 443, Management of Fine Dining) – the assessment measures need to be developed
- (10) Rate that Dietetics students are placed in dietetic internships
- (11) Rate that Dietetics students pass the standardized exam to become a Registered Dietitian
- (12) Database of job placement is being developed

Graduate program (currently two options; will be two concentrations this fall 2008)

- (1) Final oral exam for MS students
- (2) Qualifying exam, preliminary exam, and final exam for PhD students
- (3) Annual written progress report by each graduate student; annual progress report by faculty advisor
- (4) Face-to-face entrance interview (up to 4 students at one time) and exit interview (confidential one-on-one) with department head (exit interviews are done with students studying with FSHN faculty who are in either the FSHN or Division of Nutritional Sciences graduate programs). Information is received on student background, how the student selected FSHN, whether or not the student participated in an internship; and job placement and salary (optional); feedback is received on the department in general, the instructional program, the student's committee, and any extracurricular activities.
- (5) Alumni survey online sent by FSHN
- (6) Informal feedback from internship supervisors to departmental head
- (7) External review by Departmental External Advisory Committee (EAC) annually. The EAC meets with a few graduate students during lunch. The EAC also receives updates on the instructional program during the meeting.
- (8) Database is being developed of job placement

SECTION 3 : PLANS FOR USING RESULTS

(a) PLANS: Brief description of plans to use assessment results for program improvement.

The assessment plan is still being written, but of the methods mentioned above, selected information will be discussed in discipline-based committees, Courses and Curriculum Committee, faculty meetings, and faculty annual retreat. Student feedback about concentrations, specific courses, specific instructors, specific experiences, and facilities will be generically presented to the faculty or individual faculty members as appropriate.

(b) TIMELINE FOR IMPLEMENTATION:

FSHN plans to continue to map the curriculum, determine the student learning objectives not being sufficiently addressed, and to develop assessment plans for each undergraduate and graduate concentration. By the end of the 2008-2009 school year, the goal is to have an assessment plan in place.

APPENDIX A: DIETETICS UNDERGRADUATE CONCENTRATION, STUDENT LEARNING OBJECTIVES

Foundation Knowledge Requirements and Learning Outcomes for Didactic Program in Dietetics

1: Scientific and Evidence Base of Practice: integration of scientific information and research into practice

KR 1.1. The curriculum must reflect the scientific basis of the dietetics profession and must include research methodology, interpretation of research literature and integration of research principles into evidence-based practice.

KR 1.1.a. Learning Outcome: Students are able to demonstrate how to locate, interpret, evaluate and use professional literature to make ethical evidence-based practice decisions.

KR 1.1.b. Learning Outcome: Students are able to use current information technologies to locate and apply evidence-based guidelines and protocols, such as the ADA Evidence Analysis Library, Cochrane Database of Systematic Reviews and the U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality, National Guideline Clearinghouse Web sites.

2: Professional Practice Expectations: beliefs, values, attitudes and behaviors for the professional dietitian level of practice.

KR 2.1. The curriculum must include opportunities to develop a variety of communication skills sufficient for entry into pre-professional practice.

KR 2.1.a. Learning Outcome: Students are able to demonstrate effective and professional oral and written communication and documentation and use of current information technologies when communicating with individuals, groups and the public.

KR 2.1.b. Learning Outcome: Students are able to demonstrate assertiveness, advocacy and negotiation skills appropriate to the situation.

KR 2.2. The curriculum must provide principles and techniques of effective counseling methods.

KR 2.2.a. Learning Outcome: Students are able to demonstrate counseling techniques to facilitate behavior change.

KR 2.3. The curriculum must include opportunities to understand governance of dietetics practice, such as the ADA Scope of Dietetics Practice Framework, the Standards of Professional Performance and the Code of Ethics for the Profession of Dietetics; and interdisciplinary relationships in various practice settings.

KR 2.3.a. Learning Outcome: Students are able to locate, understand and apply established guidelines to a professional practice scenario.

KR 2.3.b. Learning Outcome: Students are able to identify and describe the roles of others with whom the Registered Dietitian collaborates in the delivery of food and nutrition services.

3: Clinical and Customer Services: development and delivery of information, products and services to individuals, groups and populations

KR 3.1. The curriculum must reflect the nutrition care process and include the principles and methods of assessment, diagnosis, identification and implementation of interventions and strategies for monitoring and evaluation.

KR 3.1.a. Learning Outcome: Students are able to use the nutrition care process to make decisions, to identify nutrition-related problems and determine and evaluate nutrition interventions, including medical nutrition therapy, disease prevention and health promotion.

KR 3.2 The curriculum must include the role of environment, food, nutrition and lifestyle choices in health promotion and disease prevention.

KR 3.2.a. Learning Outcome: Students are able to apply knowledge of the role of environment, food and lifestyle choices to develop interventions to affect change and enhance wellness in diverse individuals and groups

KR 3.3. The curriculum must include education and behavior change theories and techniques.

KR 3.3.a. Learning Outcome: Students are able to develop an educational session or program/educational strategy for a target population.

4: Practice Management and Use of Resources: strategic application of principles of management and systems in the provision of services to individuals and organizations

KR 4.1. The curriculum must include management and business theories and principles required to deliver programs and services.

KR 4.1.a. Learning Outcome: Students are able to apply management and business theories and principles to the development, marketing and delivery of programs or services.

KR 4.1.b. Learning Outcome: Students are able to determine costs of services or operations, prepare a budget and interpret financial data.

KR 4.1.c. Learning Outcome: Students are able to apply the principles of human resource management to different situations

KR 4.2. The curriculum must include content related to quality management of food and nutrition services.

KR 4.2.a. Learning Outcome: Students are able to apply safety principles related to food, personnel and consumers.

KR 4.2.b. Learning Outcome: Students are able to develop outcome measures, use informatics principles and technology to collect and analyze data for assessment and evaluate data to use in decision-making

KR 4.3. The curriculum must include the fundamentals of public policy, including the legislative and regulatory basis of dietetics practice.

KR 4.3.a. Learning Outcome: Students are able to explain the impact of a public policy position on dietetics practice.

KR 4.4. The curriculum must include content related to health care systems.

KR 4.4.a. Learning Outcome: Students are able to explain the impact of health care policy and administration, different health care delivery systems and current reimbursement issues, policies and regulations on food and nutrition services

5. Support Knowledge: knowledge underlying the requirements specified above.

SK 5.1. The food and food systems foundation of the dietetics profession must be evident in the curriculum. Course content must include the principles of food science and food systems, techniques of food preparation and application to the development, modification and evaluation of recipes, menus and food products acceptable to diverse groups.

SK 5.1.a. Be able to apply the principles of food preparation and selection to the production of high quality standard products

SK 5.1.b. Be able to explain and use nutrition guidelines in meal planning

SK 5.2. The physical and biological science foundation of the dietetics profession must be evident in the curriculum. Course content must include organic chemistry, biochemistry, physiology, genetics, microbiology, pharmacology, statistics, nutrient metabolism, and nutrition across the lifespan.

SK 5.2.a. Be able to identify and discuss essential nutrients and food sources.

SK 5.2.b. Be able to demonstrate knowledge of metabolism

SK 5.2.c. Be able to demonstrate a basic understanding of normal and clinical nutrition and appropriate practices.

SK 5.3. The behavioral and social science foundation of the dietetics profession must be evident in the curriculum. Course content must include concepts of human behavior and diversity, such as psychology, sociology or anthropology.

APPENDIX B. FOOD INDUSTRY AND BUSINESS UNDERGRADUATE CONCENTRATION. STUDENT LEARNING OBJECTIVES

Knowledge:

Food Chemistry/Analysis

The student will be able to:

- 1) Define the structure and properties of food components (knowledge)
- 2) Identify changes in foods during processing, etc. (knowledge)
- 3) Recognize reactions of food components (knowledge)
- 4) Apply principles of laboratory techniques (application)
- 5) Identify appropriate techniques for analysis (knowledge)
- 6) Explain measures to control reactions (e.g., shelf life) (comprehension)
- 7) Acquire proficiency in laboratory techniques (knowledge)

Food Safety and Microbiology

The student will be able to:

- 1) Classify and describe pathogens and spoilage microbes in food (comprehension)
- 2) Discuss methods of control of food deterioration (comprehension)
- 3) Predict influence of food systems on growth of microbes (comprehension)
- 4) Describe laboratory techniques to identify microbes (comprehension)
- 5) Classify factors affecting microbes in various environments (comprehension)
- 6) Describe sanitation/inactivation of microbes (comprehension)
- 7) Explain food safety issues (comprehension)
- 8) Classify food microbiology lab techniques (comprehension)

Food Processing/Engineering

The student will be able to:

- 1) List raw materials' characteristics (knowledge)
- 2) Define principles of food preservation (knowledge)
- 3) Define principles of food engineering (knowledge)
- 4) Define principles of current processing techniques (knowledge)
- 5) Define packaging materials and methods (knowledge)
- 6) Describe principles of cleaning, sanitation, waste management (comprehension)
- 7) Define unit operations, mass-energy balance and transport processes (knowledge)
- 8) Discuss effect of processing parameters on product attributes (comprehension)

Applied Food Science

The student will be able to:

- 1) Define food law and government regulations (knowledge)
- 2) Explain and apply sensory evaluation principles (comprehension and application)
- 3) List principles and applications of nutrition (knowledge)
- 4) Describe and apply principles of quality assurance/control (comprehension and application)
- 5) Identify and describe parts of the food label (knowledge and comprehension)
- 6) Outline current issues in food science (knowledge)
- 7) Explain the integration of food science principles (comprehension)
- 8) Recognize the principles of statistics and proficiency in food applications (knowledge)
- 9) Recognize computer proficiency in food applications (knowledge)

Business

The student will be able to:

- 1) List and define principles of marketing (knowledge)
- 2) List and define principles of retailing (knowledge)
- 3) List and define principles of buyer behavior/target markets (knowledge)
- 4) List and define principles of management (knowledge)
- 5) List and define principles of economics and finance (knowledge)
- 6) Discuss and apply product costing (comprehension and application)
- 7) Explain distribution channels of foods (comprehension)
- 8) Describe marketing strategies in the food industry (comprehension)

Success Skills:

The student will be able to:

- 1) Apply scientific reasoning and problem solving skills (application)
- 2) Discuss professionalism/ethics (comprehension)
- 3) Apply information acquisition, data collection, and management skills (application)
- 4) Demonstrate project organization and interaction (team work, leadership) skills (application)
- 5) Practice and use technical oral and written communication skills (application)

FSHN 101 - Intro Food Science & Nutrition FSHN 120 - Contemporary Nutrition FSHN 131 - Introductory Food Laboratory FSHN 199 - Undergraduate Open Seminar FSHN 260 - Raw Materials for Processing FSHN 302 – Sensory Evaluation of Foods FSHN 332 - Science of Food Systems FSHN 398 – Undergraduate Seminar FSHN 465 - Principles of Food Technology FSHN 466 - Product Development FSHN 471 - Food & Industrial Microbiology FSHN 472 - Sanitation in Food Processing	ACES 100 - ACE 222 (or BADM 320) - Marketing Commodity/Food Products ACE 231 (or BADM 310) - Food Agribusiness Management <u>Other courses (credits)</u> Business (3-4) Statistics (4)
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APPENDIX C. FOOD SCIENCE UNDERGRADUATE CONCENTRATION. STUDENT LEARNING OBJECTIVES

(from the IFT website: <http://www.ift.org/cms/?pid=1000427>)

Food chemistry and analysis

- Structure and properties of food components, including water, carbohydrates, protein, lipids, other nutrients and food additives
 - Understand the chemistry underlying the properties and reactions of various food components
- Chemistry of changes occurring during processing, storage and utilization

- Have sufficient knowledge of food chemistry to control reactions in foods.
 - Understand the major chemical reactions that limit shelf life of foods.
 - Be able to use the laboratory techniques common to basic and applied food chemistry.
 - Principles, methods, and techniques of qualitative and quantitative physical, chemical, and biological analyses of food and food ingredients.
 - Understand the principles behind analytical techniques associated with food.
 - Be able to select the appropriate analytical technique when presented with a practical problem.
 - Demonstrate practical proficiency in a food analysis laboratory.
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Food safety and microbiology

Pathogenic and spoilage microorganisms in foods

- Identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow.
 - Identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods.
 - Utilize laboratory techniques to identify microorganisms in foods.
 - Beneficial microorganisms in food systems
 - Understand the principles involving food preservation via fermentation processes.
 - Influence of the food system on the growth and survival of microorganisms
 - Understand the role and significance of microbial inactivation, adaptation and environmental factors (i.e., a_w , pH, temperature) on growth and response of microorganisms in various environments.
 - Control of microorganisms
 - Be able to identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods.
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Food processing and engineering

- Characteristics of raw food material
 - Understand the source and variability of raw food material and their impact on food processing operations.

- Principles of food preservation including low and high temperatures, water activity, etc.
 - Know the spoilage and deterioration mechanisms in foods and methods to control deterioration and spoilage.
 - Understand the principles that make a food product safe for consumption.
- Engineering principles including mass and energy balances, thermodynamics, fluid flow, and heat and mass transfer
 - Understand the transport processes and unit operations in food processing as demonstrated both conceptually and in practical laboratory settings.
 - Be able to use the mass and energy balances for a given food process.
 - Understand the unit operations required to produce a given food product.
- Principles of food processing techniques, such as freeze drying, high pressure, aseptic processing, extrusion, etc.
 - Understand the principles and current practices of processing techniques and the effects of processing parameters on product quality.
- Packaging materials and methods
 - Understand the properties and uses of various packaging materials.
- Cleaning and sanitation
 - Understand the basic principles and practices of cleaning and sanitation in food processing operations.
- Water and waste management
 - Understand the requirements for water utilization and waste management in food and food processing.

Applied food science

- Integration and application of food science principles (food chemistry, microbiology, engineering/processing, etc.)
 - Be able to apply and incorporate the principles of food science in practical, real-world situations and problems.
- Computer skills
 - Know how to use computers to solve food science problems.

- Statistical skills
 - Be able to apply statistical principles to food science applications.
- Quality assurance
 - Be able to apply the principles of food science to control and assure the quality of food products.
- Analytical and affective methods of assessing sensory properties of food utilizing statistical methods
 - Understand the basic principles of sensory analysis.
- Current issues in food science
 - Be aware of current topics of importance to the food industry.
- Food laws and regulations
 - Understand government regulations required for the manufacture and sale of food products.

APPENDIX F. HUMAN NUTRITION UNDERGRADUATE CONCENTRATION. STUDENT LEARNING OBJECTIVES

Knowledge:

The student will be able to:

1. apply the principles of inorganic chemistry (application)
2. apply the principles of organic chemistry (application)
3. apply the principles of biochemistry (application)
4. apply the principles of systemic physiology (application)
5. apply the principles of microbiology (application)
6. apply the principles of molecular and cell biology (application)
7. apply, explain, integrate, and summarize the knowledge of intermediary metabolism (application, analysis, synthesis)

8. summarize the nutrient requirements in health and disease (analysis)
9. differentiate nutrient deficiencies and toxicities (analysis)
10. discuss nutrient-nutrient and nutrient-drug interactions (comprehension)
11. describe the role of non-nutritive components of food in health and disease (comprehension)
12. outline the process of approving a health claim and list the currently approved health claims (knowledge)
13. explain nutrient supplementation and food product fortification (comprehension)
14. describe and discuss obesity and the metabolic syndrome (comprehension)
15. analyze data using basic statistics (analysis)
16. recommend dietary patterns for good health (evaluation)
17. formulate nutrition therapy for chronic disease (synthesis)
18. explain food and nutrition laws, regulations, and policies (comprehension)
19. summarize nutrition throughout the life cycle (synthesis)
20. demonstrate dietary analysis (application)