Credit Hour Explanation

<table>
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<tr>
<th>Program credit hour requirements</th>
<th>A) Number of credit hours in current program (Quarter credit hours)</th>
<th>B) Calculated result for 2/3rds of current (Semester credit hours)</th>
<th>C) Number of credit hours required for proposed program (Semester credit hours)</th>
<th>D) Change in credit hours</th>
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<tr>
<td>Total minimum credit hours required for completion of program</td>
<td>135</td>
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<td>Required credit hours offered by the unit</td>
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<td>Maximum</td>
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<td>Required credit hours offered outside of the unit</td>
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<td>Maximum</td>
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<td>Required prerequisite credit hours not included above</td>
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<td>Maximum</td>
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Program Learning Goals

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

- Students will exhibit a balanced background in chemistry, microbiology and process engineering enabling the multidisciplinary study of food
- Students will possess a knowledge of how to search the literature, critically evaluate the literature, and a deep understanding of the literature in their specific field
- Students will be proficient in designing, performing and analyzing and interpreting research results
- Students will possess strong problem solving, critical thinking and analytical skills
- Students will exhibit effective professional skills including leadership, written and oral communications, time management, and teamwork--performed in an ethical manner

Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? Yes

Does the degree program or major have an assessment plan on file with the university Office of Academic Affairs? No
DIRECT MEASURES (means of assessment that measure performance directly, are authentic and minimize mitigating or intervening factors)

Classroom assignments
* Other classroom assessment methods (e.g., writing assignments, oral presentations, oral exams)

Direct assessment methods specifically applicable to graduate programs
* Candidacy exams
* Research proposals written and grants awarded
* Thesis/dissertation oral defense and/or other oral presentation
* Thesis/dissertation (written document)
* Publications

INDIRECT MEASURES (means of assessment that are related to direct measures but are steps removed from those measures)

Additional types of indirect evidence
* Job or post-baccalaureate education placement
* Student or alumni honors/recognition achieved
* External program review

USE OF DATA (how the program uses or will use the evaluation data to make evidence-based improvements to the program periodically)
* Analyze and discuss trends with the unit's faculty
* Analyze and report to college/school
* Analyze and report to accrediting organization

Program Specializations/Sub-Plans
If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

Pre-Major
Does this Program have a Pre-Major? No

Attachments
* PhD attachment.pdf
    (Letter from Program offering Unit: Owner: Mangino, Michael E)

Comments

Workflow Information

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PhD

Letter from the Program-offering Unit
The Department of Food Science & Technology is submitting the following:

- BS in Food Science: Converted
- BS in Ag – Food Business: Converted
- BS in Culinary Science: New
- Minor in Food Processing: Converted
- Minor in Food Safety: Converted
- MS in Food Science: Converted
- PhD in Food Science: Converted

The faculty held numerous meetings as a whole and in subgroups during this process. A faculty member attended the UCAT session on semester conversion and chaired a conversion committee.

The committee started by examining the results of two recent reviews by two external groups, The National Institute of Food and Agriculture (NIFA) formerly Cooperative State Research, Education, and Extension Service (CSREES) and The Institute of Food Technologists. The later review required that we map learning outcomes with courses.

Using the material generated for and by these reviews the committee considered what outcomes were still appropriate for our programs and how to best insure that students achieve these outcomes. A set of learning outcomes were generated and discussed with faculty. The committee also examined the curricula of 15 other food science programs to examine their learning outcomes and the course work that was utilized to achieve them. A grid was developed to show courses that were required by all or nearly all programs and others that were unique.

We also examined exit surveys of graduating students who were asked to rate the level of preparedness for each of our learning objectives. Graduates who were out for ten or more years were asked to rate the effectiveness of the their training in the same areas. We were gratified to note that for virtually all learning outcomes students and alumni rated their education as good or better. The ranking of the new graduates did not differ much from those who had been working. Alumni tended to rank their preparedness in communication skills a little lower but ranked areas such as working in teams and problems solving higher that did new graduates.

This information was shared with the entire faculty who approved the suggested learning outcomes by a voice vote. A list of ten courses were devised that would serve as the basis for our programs. Committees of faculty who taught quarter equivalent courses, related courses or courses that were being combined were formed and charged with developing syllabi and learning outcomes for each of the ten courses. They were also asked to consider at what level the learning outcomes for the degree were being met by these courses.
The proposed curriculum was discussed with two student focus groups and the Department’s Industry Advisory Board. The majority of student comments regarded the new order of courses and better identification of prerequisites. They felt the new curriculum was clearer and more logical. The advisory board advocated for a continuation of the requirements of communications and third writing and liked the problem solving nature of the major capstone courses.

All course committees presented their material to the semester committee in groups of related courses. This was so that all were aware of what others were accomplishing, so that expectations of related courses were known by those concerned and to allow discussion and suggestions for modification.

Modified syllabi were posted to a web site to allow all faculty easy access and the chance to provide feedback. After the original ten courses were redesigned the remaining support courses were also examined and converted to a semester format. A similar process was followed for our graduate degree programs.

A new program is also proposed as a result of work of collaboration between our department and the Central Ohio Technical College (COTC). It proposes a two plus two program combining an Associate Degree in Culinary Science with two years of work in the Department of Food Science and Technology to yield a BS in Culinary Science. Graduates of two-year culinary programs not from COTC but with a two year culinary degree from a program approved the American Culinary Association would also be eligible to participate. They would probably have to complete an additional three or four science courses to meet all degree requirements.

The Culinary Science major will use many of the courses in the existing Food Science and Food Business Management majors, but is differentiated by an emphasis in culinary arts with supporting courses in hospitality management. Students with a culinary background will enrich food science courses by the unique perspective they bring. The courses they take in food processing, food additives, food law, food safety, etc. will make them better able to adapt to the needs of large scale food production.

The final curricula for all degrees and minors were unanimously approved at a special faculty meeting convened to discuss the final semester proposal.

The faculty of the department is excited about the revised programs and is confident that the better packaging of learning objectives and alignment of prerequisite courses that has resulted will make our degree offerings stronger.

Program Rationale Statement
The last major revision to the graduate degree by the department occurred in 2002. In the past 8 years we have had reviews by two external groups, The National Institute of Food and Agriculture (NIFA) formerly Cooperative State Research, Education, and Extension Service (CSREES) and The Institute of Food Technologists.
Using the material generated for and by these reviews we continue to discuss the outcomes and delivery methods to optimally train our students in research and the advanced topics they need to learn in their classes. With the semester conversion, several graduate level courses will be combined while others are being added to better serve the needs of the students. Some are being converted to semester courses while others are being offered in pairs, each a half semester long.

The main benefit to students will be a broader choice of advanced courses, based on their area of focus.

I recommend this program for approval and I am willing to provide additional information or answer question as needed.

Thanks

Mike Mangino
Professor Emeritus & Interim Chair

List of Semester Courses
Core Curriculum
Ph.D. students are required to take at least 30 course credits at OSU beyond their MS degree, and at least 15 of these must be in FST at OSU. 8999. Students must meet the same minimum course requirements as an MS student. Equivalent knowledge may include a similar course completed elsewhere, demonstrated proficiency, or real world experiences. A short statement on equivalence is written by the student with advisor support and given to the Graduate Studies Committee for approval. All courses with no prefix are in the Food Science and Technology department. Courses below the 5000 level do not receive graduate credit.

A. Chemistry: 5600, 5610
B. Engineering and Processing: 5410, 5420, 5430, 5400, FABE 3481, or ANSCI 4500
C. Microbiology: 5536 and 5546 (both must be taken)
D. Nutrition and Biochemistry: HUNTR310, HUNTR610, BIOCHEM511, 761, or 762
E. Integrated: 5710, 5720, or 5730

In addition, Ph.D. students are required to take at least three courses from 7000 and 8000 level courses. Two of these must be in the FST department. Note that the 7000 and 8000 level courses do not fulfill the minimum course requirements for the MS degree. Courses taken during the MS degree can be used to count toward the requirements for 7000 and 8000 level).

7536. Advanced Food Microbiology 1
7546. Advanced Food Microbiology 2
7610. Instrumental Analysis 1
7611. Instrumental Analysis 2
7620. Toxicology
7630. Colors and Pigments
7640. Food Carbohydrates and Proteins
7650. Food Flavors and Lipids

In addition, the student must take seminar class once in the autumn and once in the spring.

**Semester Advising Sheet(s)**
Each student’s course requirements are decided by the advisory committee and are designed to meet the unique needs of that student. Courses will vary depending upon the student’s background and also on their research area.

The student is required to meet with their advisory committee within two semesters of starting the program. The student presents their course plan, outlining which courses will be taken each semester for their entire degree. The committee makes edits as needed, and the signed form is filed with the student’s file. If the student wishes to take different courses than listed on the approved advising sheet, they must have the committee approve the new advising sheet and have it placed in their file.

**Quarter Advising Sheet(s) (required for re-envisioned or converted programs only)**

**Transition Policy**
Students currently in the program should not be affected by the transition, since they should complete all of their course work within the next two years. Advisory committees will meet with any students who are affected to adjust their course plans. New students starting in the program will be required to present a course plan that shows the correct quarter followed by semester courses so that their course plan will be correct when it is signed and placed in their file.