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Faculty Members of the Field of Food Science and Technology

Last Name	First Name	Department	College
Abbaspourrad	Alireza	Food Science	CALS
Acree	Terry	Food Science	CALS
Adalja	Aaron	Applied Economics and Policy Area	College of Business
Alcaine	Sam	Food Science	CALS
Barbano	David	Food Science	CALS
Batt	Carl	Food Science	CALS
Bihn	Elizabeth	Food Science	CALS
Boor	Kathryn	Food Science	CALS
Brady	John	Food Science	CALS
Cummings	Kevin	Population Medicine	Veterinary Science
Dando	Robin	Food Science	CALS
Datta	Ashim	Biological and Environmental Engineering	CALS
Gibney	Patrick	Food Science	CALS
Glahn	Raymond	Food Science	CALS
Goddard	Julie	Food Science	CALS
Henry	Susan	Molecular Biology and Genetics	CALS
Hunter	Jean	Biological and Environmental Engineering	CALS
Ivanek	Renata	Population Medicine	Veterinary Science
Lee	Chang Yong	Food Science	CALS
Lei	Xingen	Animal Science	CALS
Liu	Rui Hai	Food Science	CALS
Loss	Christopher	Food Science	CALS
Mansfield	Anna Katharine	Food Science	CALS
March	John	Biological and Environmental Engineering	CALS
Marquis	Helene	Microbiology and Immunology	Veterinary Science
Moraru	Carmen	Food Science	CALS
Mukai	Motoko	Food Science	CALS
Nugen	Sam	Food Science	CALS
Padilla-Zakour	Olga	Food Science	CALS
Rizvi	Syed	Food Science	CALS
Sacks	Gavin	Food Science	CALS
Shuler	Michael	Biomedical Engineering	Engineering
Snyder	Abigail	Food Science	CALS
Tako	Elad	Food Science	CALS
Warnick	Lorin	Population Medicine	Veterinary Science
Watkins	Christopher	Horticulture	CALS
Wiedmann	Martin	Food Science	CALS
Worobo	Randy	Food Science	CALS
Emeritus			
Brenna	Thomas	Nutritional Science	Human Ecology
Miller	Dennis	Food Science	CALS
Regenstein	Joe	Food Science	CALS

Areas of Concentration in Food Science & Technology

Food Science (General)
Advanced studies in food science (general) provide a broader, more varied education than is possible in the other concentrations. Students who select this concentration should have some previous experience in food science and technology.

Students in food science (general) are expected to take courses in food chemistry, food engineering and processing, food microbiology, nutrition, and food marketing as well as in the supporting disciplines and commodity areas in their special interests.

The many active research programs in food science and technology provide excellent opportunities and facilities for research in engineering aspects of food processing, packaging, and storage; measurement of the physical properties of foods; unit operations; food rheology and texture; process engineering; dehydration; concentration; evaluation of changes in nutrient content of foods during processing and storage; protein and enzyme technology; food fabrication; product and process development; packaging; development of new ingredients; functional properties of food components; meat (animal, avian) handling and processing; and specific research on various food commodities.

Faculty in this concentration area include: D. Barbano, E. Bihn, K. Boor, T. Brenna, R. Glahn, P. Gibney, C. Lee, X. Lei, R.H. Liu, J. March, D. Miller, C. Moraru, J. Regenstein, S. Rizvi, M. Shuler, E. Tako, C. Watkins, and M. Wiedmann.

Food Chemistry
Food chemistry is concerned with analytical, biochemical, chemical, physical, nutritional, and toxicological aspects of foods and food ingredients. The long-term goals of research in food chemistry are to understand relationships between the structure and functional properties of food molecules and to improve the nutritional, safety and organoleptic aspects of food.

Students of food chemistry must have a strong background in the basic sciences and should specialize in one or more of the following minor areas: organic chemistry, biochemistry, nutritional biochemistry, physical chemistry, toxicology, analytical chemistry, and chemical engineering.

Opportunities for research projects in food chemistry include structure/function relationships in food molecules (rheology, emulsions, foams, gels); computer modeling of food molecules; effects of processing, fortification, and packaging on nutritional quality of foods; food toxicology; and flavor chemistry of fruits and vegetables.

Faculty in this concentration area include: T. Acree, D. Barbano, J. Brady, T. Brenna, R. Glahn, C. Lee, R.H. Liu, D. Miller, M. Mukai, O. Padilla-Zakour, R. Parker, J. Regenstein, G. Sacks, and E. Tako.

Food Microbiology

Microbiology is important to food safety, production, processing, preservation, and storage. Food microbiology students use a wide variety of modern technologies from fields including immunology, microbiology, and molecular biology. Microbes such as yeasts, molds, and bacteria are being used for the production of foods and food ingredients. Beneficial microbes are exploited in the fermentative production, processing, and preservation of many foods and beverages. Spoilage microorganisms cost food producers, processors, and consumers millions of dollars annually in lost products. Lost productivity resulting from illness caused by foodborne microorganisms is an enormous economic burden throughout the world. The study of food microbiology includes understanding not only the factors influencing the growth of microorganisms in food systems but also the means of controlling them.

Students who specialize in food microbiology are expected to have sound undergraduate training in microbiology, physics, chemistry, organic chemistry, and biochemistry.

Possible research projects include the genetic control of microorganisms important to foods, the genetics and biochemistry of bacteriophage, site-directed mutagenesis to improve catalytic functions of enzymes, the spoilage bacteria in fruit products, factors influencing growth of human pathogens in foods, and rapid methods for detecting foodborne pathogens.

Faculty in this concentration area include: S. Alcaine, A. Adalja, C. Batt, E. Bihn, K. Boor, K. Cummings, P. Gibney, J. Goddard, S. Henry, R. Ivanek, J. March, H. Marquis, S. Nugen, L. Warnick, M. Wiedmann, and R. Worobo.

Food Engineering

Food engineering applies engineering principles to food processing equipment. Because engineering is a quantitative discipline, the food engineer's fundamental tool is mathematics. Chemistry and microbiology are also important disciplines because processes of concern to food engineers may involve chemical reactions, microbial interactions, or both.

Food engineering students gain a thorough understanding of thermodynamics, reaction kinetics, and transport phenomena applied to food processes. Knowledge of computer programming, microprocessor applications, statistics, and engineering economics is encouraged. Courses are available in thermal processing and other unit operations, physical and engineering properties of foods, rheology, and food packaging.

Students in food engineering should consider taking related courses in one of the engineering departments and should select a professor in one of those departments to serve on their Special Committee.

Potential research projects in food engineering include heat and mass transport phenomena in food systems, the rheology of fluid foods in food processing, supercritical fluid extraction of biomaterials, extrusion, computer applications in process control and data acquisition, energy conservation through process modifications, and engineering properties of food and related biomaterials.

Faculty in this concentration area include: T. Brenna, A. Datta, J. Goddard, J. Hunter, J. March, C. Moraru, O. Padilla-Zakour, S. Rizvi, and M. Shuler.

Dairy Science

Dairy science involves the chemistry, microbiology, and engineering properties of dairy foods. Long-term goals of the dairy science program at Cornell are to improve the quality and safety of milk and processed dairy products and to develop improved methods for the manufacture of cheese and other dairy products.

Cornell has a long tradition of excellence in dairy science. Cornell and the University of Vermont jointly administer the Northeast Dairy Foods Research Center (NEDFRC), which is funded by the National Dairy Board and local dairy industries. Scientists from both universities participate in joint research and technology activities related to dairy foods. The NEDFRC offers outstanding opportunities for graduate students to participate in top-quality research and development in dairy foods.

Prior training in dairy or food science and technology is desirable but not essential. Students of dairy science may choose courses in food science, dairy chemistry, microbiology, chemistry, and biochemistry. Examples of research projects in dairy science include cheese flavor development, membrane processing of milk and whey, studies of native milk enzymes and their role in cheese flavor, the functional properties of whey proteins, and computer modeling to manipulate the functional properties of b-lactoglobulin.

Faculty in this concentration area include: S. Alcaine, D. Barbano, K. Boor, C. Moraru, and M. Wiedmann.

Food Processing Waste Technology

The increasing importance of pollution control and energy and resource conservation has created a demand for people trained in food processing waste technology in industry, government, and research institutions. The primary objective of research in this area is to convert byproducts of food processing operations to usable materials. For example, processes using ultrafiltration technology have been developed to concentrate cheese whey proteins for use as food ingredients. Experiments are under way to develop practical methods of converting fruit and vegetable processing wastes into fuels, chemicals, biologicals, and food ingredients.

A background in biology, microbiology, chemistry, food science and technology, or environmental science provides a good base for graduate study in food processing waste technology. Students should structure their graduate programs to expand their knowledge in microbiology, biochemistry, analytical chemistry, engineering, and applicable environmental or other sciences.

Faculty in this concentration area include: J. Goddard, J. Hunter, O. Padilla-Zakour, J. Regenstein, S. Rizvi and M. Shuler.

International Food Science

International food science was established at Cornell in recognition of the need for technically trained people in careers involving the production of new and more nutritious foods, the improvement of food preservation techniques for developing countries, and the organization, implementation, and administration of food development programs.

International food science encompasses all phases of the development of foods, including technology, preservation, nutrient composition, safety, new product development, marketing, and project planning. Actual and potential problems of developing countries are studied, and whenever feasible and appropriate, students in international food science may conduct their research in a developing country.

Students who choose this area of concentration are expected to take courses in international agriculture, postharvest handling and physiology of foods, international nutrition, international economic development, international law, communications for developing countries, and food processing.

Faculty in this concentration area include: E. Bihn, K. Boor, R. Gravani, C. Lee, X. Lei, J. Regenstein, S. Rizvi, E. Tako, C. Watkins, and M. Wiedmann.

Sensory Evaluation

Sensory evaluation uses test methods that provide information on how products are perceived through the senses. The importance of sensory perception to food quality is widely appreciated in the food industry, providing a demand for such specialists.

Like other quantitative disciplines, sensory evaluation attempts to provide precise and accurate measurements. Yet, because the data are collected from human beings, who are notoriously variable, sensory evaluation studies pose a special challenge, and statistical techniques are necessary. Basic principles of human judgment and perception are also important, and students are encouraged to take courses in the behavioral sciences. Cornell offers a unique range of courses and research opportunities in sensory evaluation.

Research projects are conducted in three main areas. Methods research is aimed at providing improvements in the reliability and validity of sensory tests. Product-focused research uses sensory analysis to measure the success of variations in product processing or ingredients. Basic research on perception and human judgment advances our understanding of sensory function.

Faculty in this concentration area include: T. Acree, R. Dando, C. Loss, and A.K. Mansfield.

Enology

Enology applies expertise from a wide range of disciplines, including microbiology, chemistry, sensory science and process technology to the science of wine and winemaking. The objectives of enological research at Cornell University are to understand and develop methods to control microbiological, chemical and processing variables and their effect on wine quality, organoleptic properties and health.

Faculty in this concentration have expertise in analytical chemistry, sensory analysis, biology of yeast and bacteria, health effects, product development and sanitation. Because of the multidisciplinary nature of Enology, this concentration is suitable for students interested in careers in academia, industry and government in areas related to Enology as well as in any areas related to food and industrial fermentations.

Enology students should have a background in microbiology, organic chemistry or biochemistry, sensory science or engineering. Prior exposure to winemaking is highly desirable but not required.

Students who select this concentration may specialize in a variety of aspects, including microbial metabolism and genetics, chemistry and analysis of grapes, wines and winemaking adjuncts, winemaking technology and sensory analysis.

Faculty in this concentration area include: P. Gibney, A.K. Mansfield and G. Sacks.

Degrees Offered

Master of Food Science (professional), MFS – The Master of Food Science (MFS) program in Food Science and Technology is designed for individuals who want to prepare for career opportunities in food science but are not currently interested in research focused graduate degrees. The MFS program emphasizes breadth of training via course work rather than research experience. This master's program may be completed in as little as two semesters and does not require thesis research.

Master of Science, MS – The MS is a research degree (a thesis is required) and prepares students for continuation to a PhD program or for a variety of research and development positions.

Doctor of Philosophy, PhD – The highest research degree Food Science offers. Students are strongly encouraged to complete a master's degree before proceeding into a PhD program.

Requirements for the MS Degree

- Form a Special Committee with one Chair and one minor member by the start of the second semester
- Completion of a minimum of 2 academic semesters
- Maintain a minimum grade point average of 2.7
- Completion of the degree within four years of admission
- Enrollment in at least 12 credits per semester, not including audited classes.
- Enrollment in FDSC 6000, Seminar, every semester
- Enrollment in FDSC 6010, Principles and Applications of Food Science and Technology, during the first fall semester
- Enrollment in FDSC 6060, Graduate Student Research Hour, fall and spring semester of 2nd year
- Enrollment in FDSC 6950, Current Readings in Food Science, once during the MS program
- Gain experience as a teaching assistant for at least one semester
- Present a public seminar during FDSC 6000 or a special seminar
- Yearly completion of Student Progress Review
- Understanding of core competencies in food science
- Successful completion of two exams:
    - MS Q exam – completed before the start of the second semester
    - MS exam – taken after completing all degree requirements
- Satisfactory completion of a thesis under the supervision of the Special Committee (the thesis must include an abstract, not to exceed 600 words)
- Students should consult the Graduate School website for specific information regarding the completion of degree and submission of the thesis

Requirements for the PhD Degree

- Form a Special Committee with one Chair and two minor members by the start of the second semester, each student will be assigned a field appointed member
- Completion of a minimum of 6 academic semesters with at least two coming after the A exam
- Maintain a minimum grade point average of 3.0
- Completion of the degree within seven years of admission
- Enrollment in at least 12 credits per semester, not including audited classes.
- Enrollment in FDSC 6000, Seminar, each semester
- Enrollment in FDSC 6010, Principles and Applications of Food Science and Technology, during the first fall semester
- Enrollment in FDSC 6060, Graduate Student Research Hour, fall and spring semester during 2nd and 3rd year
- Enrollment in FDSC 6950, Current Readings in Food Science, two times during the PhD program
- Gain experience as a teaching assistant for at least one semester
- Present a public seminar during FDSC 6000 or a special seminar
- Yearly completion of Student Progress Review
- Understanding of core competencies in food science
- Successful completion of three exams
    - Q exam – completed before the start of the second semester
    - A exam – completed after completing two registration units but before starting the seventh semester
    - B exam – taken after completing all degree requirements, but not earlier than one month before completing six registration units
- Satisfactory completion of a dissertation under the supervision of the Special Committee. The thesis must include an abstract, not to exceed 350 words.
- Students should consult the Graduate School web site for specific information regarding the completion of degree and submission of the dissertation

Special Committee (MS and PhD students only)

MS and PhD students at Cornell are guided by "Special Committees." The role of the Special Committee is to help the student develop his/her graduate educational program and goals and to administer exams to ensure that the goals have been met. Committees are composed of members of the Graduate Faculty of the University. The Committee chairperson serves as the major advisor and must be a member of the Field of Food Science and Technology, other members of the Committee represent minor fields of study. Initially, students are assigned a temporary advisor who will assist them with course selections and other matters until the Special Committee is in place. ***Field Policy: All students must choose their Special Committee before the start of the second semester of residence. Students who are unable to form a committee with the required number of members cannot continue in the Graduate School.***

Students establish their Special Committee by submitting the on-line Special Committee Selection and Change form available through Student Center. It is customary for students to choose their chairperson first and then, in consultation with their chairperson, approach faculty in other Fields to serve as minors.

The choice of the Special Committee is extremely important because the committee will have a major influence on the student's degree program. If, for some reason, students wish to change their Special Committee, they may do so by completing another Special Committee Selection and Change form and submitting it to the Graduate School. Signatures of all new and current members of the Special Committee as well as the Director of Graduate Studies are required on the form.

MS candidate's Special Committee is composed of:

- A chairperson representing the Field of Food Science and Technology
- One additional member representing another Field or the Field of Food Science and Technology*

PhD candidate's Special Committee is composed of:

- A chairperson, representing the Field of Food Science and Technology
- Two additional members representing two minor fields. One minor member may also be a member of the Field of Food Science and Technology*
- In addition, PhD students are assigned a field appointed member prior to the Q exam. Although the field appointed member is not an "official" committee member, he or she has full voting privileges during the Q and A exams.

**Students who select a minor member from the Field of Food Science and Technology must choose a faculty member in an area of concentration different from that chosen for their major.*

Registration Requirements

Registration requirements are measured by semesters of full-time study. Half-time registration status fulfills requirements at 50% of the full-time rates. Half-time registration is the smallest fraction that may be counted towards degree requirements.

Two semesters of registration are the minimum requirement for a MS degree. Six semesters of registration, two of them after the A Exam, are the minimum requirement for the PhD degree. At least four semesters of registration are required for a non-thesis master's degree awarded to a doctoral student.

A PhD students may petition to receive up to two semesters of registration for master's work completed in a relevant program. A Request for Transfer of Registration form must be submitted to the Graduate School.

At least one-half of required registered semesters must be earned from fulltime, academic-year study on the Ithaca campus or a satellite location, except for students in the Employee Degree Program.

Coursework

All graduate students are required to enroll in at least 12 credits each semester. Course enrollment is the act of signing up for specific courses offered by Cornell's colleges and schools. It is distinct from registration with the University. Students must enroll in courses within three weeks of registration. Students not enrolling in specific courses must enroll for thesis or dissertation research using either Graduate School or, if available, departmental course numbers assigned for that purpose.

Students may enroll in courses either for credit or audit. Auditing (which appears as "V" on unofficial transcripts) means that the student pledges regular class attendance but not necessarily participation in all aspects of the course. Audited courses do not count toward the 12 credit requirement each semester.

Through the seventh week of the semester, courses may be dropped, credit hours may be changed, and grading options may be changed, without penalty. After the seventh week, courses may be added and changes to credit hours and grading options may be made only in exceptional circumstances. A petition signed by the instructor and the student's special committee chair is required.

A course dropped after the seventh week appears on transcripts with a "W," signifying Withdrawn. Exceptions may be approved when a student submits a petition approved by both the instructor and the special committee chair. After the last day of classes for the semester, no course may be dropped and no changes may be made to credit hours and grading options.

There are course requirements for FST graduate students (FDSC 6000, FDSC 6010, FDSC 6060, and FDSC 6950). Beyond that, each student works with his/her special committee to choose courses that best fit the

student's degree program. However, to constitute a minimum exposure requirement in food science, it is recommended that students take at least one course in food science other than FDSC 6000 and 6010.

All graduate students are required to register for:

- FDSC 6000, Seminar (every semester)
- FDSC 6010, Principles and Applications of Food Science and Technology (first fall semester)
- FDSC 6060, Graduate Student Research Hour (2nd year for MS students, 2nd and 3rd year for PhD students)
- FDSC 6950, Current Readings in Food Science (once for MS students, twice for PhD students)

Food Science 6000 Seminar

All graduate students must enroll in this course each semester, unless you are granted an exemption (see below for details). This course is not a full semester course, it is only offered for a 7-week period (see below for details). Students missing more than one seminar without a written excuse will be given an unsatisfactory (U) grade. Each semester volunteers are needed to assist with seminar, students may be appointed to this position.

- Ithaca Seminar – Tuesdays afternoons (1-hour in duration) in room 146 Stocking Hall
    - Fall seminar course is offered the first seven weeks of the semester only
    - Spring seminar course is offered the last seven weeks of the semester only

Exemptions:

Students, who have a class conflict with the seminar schedule during a given semester, may request a waiver of the seminar requirement for that semester. Waiver requests should be sent to Erin Atkins with a copy to your advisor/committee chair. The waiver request must provide the class information (i.e. number, title, description) and must be a course that is required for your degree.

Make-up Seminars:

If a student misses more than one seminar, which results in not meeting the attendance requirement, the student may request that a substitute seminar be used as credit towards the missed Food Science seminar. Missed seminars may be made-up ONLY if (1) your advisor/committee chair agrees you can make up the seminar, (2) Erin Atkins has been notified of the third seminar absence via e-mail with a copy to the advisor/committee chair **beforehand,** (3) the student is granted permission to make-up the missed seminar by attending a seminar in a department other than food science, and (4) a report and evidence of the attendance from the make-up seminar is submitted to Erin Atkins no later than two weeks after the missed seminar.

Attending seminars outside of Food Science:

With advance notice, the Field of Food Science and Technology will support students that would like to attend a seminar, other than FDSC 6000, to be counted towards their FDSC 6000 seminar attendance. Students will receive credit for an alternate seminar under the following conditions (1) the alternate seminar should take place the same week that the student will not be in attendance during FDSC 6000, (2) student must provide the alternate seminar announcement, evidence of attendance, and a summary of the alternate seminar to Erin Atkins no later than the start of the next week's FDSC 6000 seminar. Students can attend a maximum of two alternate seminars in place of FDSC 6000.

Food Science 6010, Principles and Applications of Food Science and Technology
This is a 1 credit course, team-taught by faculty members, that is required of all graduate students with majors and minors in Food Science and Technology. The course is taught during the fall semester only. Students matriculating in the spring should sign up for the class during the fall. The course objectives are:

- To provide Food Science and Technology graduate students with a common experience
- To introduce new graduate students to the graduate faculty in food science
- To expose students to the many research opportunities food science offers
- To help students learn to critically evaluate research papers in food science
- To present and discuss concepts and principles that are fundamental to the discipline of food science
- To discuss current issues and controversies related to food and nutrition
- To raise and discuss ethical issues related to scientific conduct, publishing, and citing the work of others in written and oral presentations

FDSC 6060, Food Science Graduate Student Research Hour
This course is required of all MS/PhD graduate students in the Field of Food Science and Technology. The course is designed to foster connections between our graduate student population in the Field of Food Science. The class meets once per week for 7 weeks in the fall and spring, where students will present for either 15 or 30 minutes on their own research. Each presentation will be followed by questions from the class. The course will also provide an introduction to the following topics: research integrity, publication process, statistics in publishing, opportunities for graduate student funding, and grant writing.

FDSC 6950, Current Readings in Food Science
This course is designed to give members of the food science and broader scientific community an opportunity to stay up-to-date on the most current discoveries and methods used in food science. The course is designed to foster meaningful discussions about (1) recent publications in respected journals of basic research and (2) how these discoveries can be applied to research within the field of food science. Format consists of weekly discussion groups with each participant presenting at least one oral report based on independent reading. Multiple sections focusing on different topics may be taught in any given semester. Topics include food microbiology and food safety, food chemistry, sensory evaluation, and food engineering and materials science. Interested students should contact the designated instructor(s) for each semester. Learning objectives include developing a habitual engagement with current literature, improving skills related to the critical evaluation of methods and conclusions, and fostering graduate student-lead communication.

At least two section topics will be offered every semester. Students select one of the two section topics to participate in when they enroll. MFS/MS students are required to participate in one section during their program. PhD students are required to participate in two sections during their program.

Teaching

The Field of Food Science and Technology requires that all MS and PhD students gain experience as a teaching assistant (one course per degree). MFS students are not required to serve as a TA; however, may do so to earn course credit. Student fulfilling their TA requirement (**and who are not funded as a TA for the semester**) can receive between 1-3 credits in Food Science 6980 for this experience as follows:

- 1 to 2 credits (ungraded) are earned depending on the type of course and responsibilities. The instructor of the course that the student is assigned to determines the credits earned.
- 1 additional credit (ungraded) can be earned for attending a graduate teaching development workshop. For workshop information visit http://www.cte.cornell.edu/programs-services/grads-future-educators-tas/get-set-workshops.html

For students funded as a teaching assistant, you can receive 1 credit hour (ungraded) by participating in three CTI workshops during the semester that your serve as a teaching assistant. To earn course credit, enroll in course FDSC 6980, Graduate Teaching Experience and be sure to complete the **three workshop sessions** prior to the end of the semester as you will not earn your credit hour without proof of certificate.

International Teaching Assistants Program (ITAP)

Students who come from non-English speaking countries must participate in an ITAP Language Assessment prior to their first TA assignment.

- Interview Scheduling: Sign up for your language assessment appointment here
- Interview Structure: The 30-minute language proficiency assessment includes an oral interview and teaching presentation. During the oral interview, the interview committee asks a variety of questions seeking a broad speech sample on which to determine their assessment. Questions are asked that require the student to speak using a variety of time frames. For the second part, ITAs are asked to prepare a five-to-seven minute explanation of a field specific term, principle or concept at a level appropriate for their future students. Faculty representatives might be able to suggest one that is most relevant to the teaching assignment.
- Interview Result: The three possible outcomes of the assessment are as follows:
    - ALS 5780 is required before beginning a teaching assignment.
    - ALS 5780 can be taken concurrently with the teaching assignment.
    - ALS 5780 is optional for the ITA.
    - Additionally, there may be other course requirements depending on the outcome of the course 5780.

The B.L. Herrington Graduate Student Teaching Award

Friends and former students of Professor Emeritus B.L. Herrington have established a fund to reward outstanding graduate teaching associates (one first place and two honorable mentions). The awards will be presented at the end of each spring semester and the first place winner will be recognized at the College level with a luncheon for the winners from all the College of Agriculture and Life Sciences. Eligibility Requirements: Open to all students who serve as a TA for at least one semester.

Research

MS and PhD students are required to write a thesis based on research performed under the mentorship of their committee chair. Research carried out is directly related to the student's thesis and is assigned on a yearly basis. Annual research progress is recorded by both the student and committee chair on the Annual Report form.

Research Credits
Students should enroll in research credits if spending time in the lab working on thesis/dissertation research. The number of credits to sign up for is determined by the advisor/committee chair.

- FDSC 8900 – MS thesis research credits (1-12 per semester)
- FDSC 9900 – PhD dissertation research credits (1-12 per semester)

Seminar

MS and PhD students are required to present at least one seminar prior to degree conferral. Students choosing to present a seminar during FDSC 6000 must contact the seminar committee chair at least three weeks prior to the beginning of the semester. Students giving a special seminar must contact Erin Atkins at least one week prior to the seminar date. All students are required to submit a Seminar Scheduling form (FS05) one week before the seminar is held and a Seminar Completion form (FS06) within three business days of the seminar. Both forms can be obtained from the Graduate Field Office.

Student Progress Review

MS and PhD students and their committee chairs are required to complete an annual online Student Progress Review (SPR) at the end of each academic year during their time in the Field of Food Science. The SPR records the progress they have made throughout the year and expectation for the coming year. This form will be administered by the Graduate School and completed by both student and advisor online. The Field Office will then access and retain a copy in the student's file.

Minimum Grade Standards

Students are expected to strive for excellence in all aspects of their graduate programs; performance in courses is one indicator of academic progress. The field adopted the following standards for evaluating performance in courses based on a normal semester course load (generally a minimum of 10-12 credits):

- ***MS candidates*** – a student should obtain at least a 2.7 average each semester to remain within the field standards.
- ***PhD candidates*** – a student should obtain at least a 3.0 average each semester to remain within the field standards.

The following statement of the Graduate School is in keeping with the above:
"Grades of C+ through D-, while passing, do not normally constitute satisfactory progress for a student enrolled in the Graduate School. The same holds for Incompletes."

Institute of Food Technologists Core Competencies in Food Science

Students enrolled in the Field of Food Science & Technology are expected to hold a certain level of competency in food science. The list below outlines the general areas of food science and the information students conferring a degree from the program need to know.

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

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: Understand the role and significance of system on the growth and survival of microorganisms microbial inactivation, adaptation and environmental factors (i.e., aW, 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.

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.

Success skills

- Communication skills (i.e., oral and written communication, listening, interviewing, etc.): 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. Critical thinking/problem solving skills (i.e., creativity, common sense, resourcefulness, scientific reasoning, analytical thinking, etc.): Define a problem, identify potential causes and possible solutions, and make thoughtful recommendations. Apply critical thinking skills to new situations.
- Professionalism skills (i.e., ethics, integrity, respect for diversity): Commit to the highest standards of professional integrity and ethical values. Work and/or interact with individuals from diverse cultures.
- Life-long learning skills: Explain the skills necessary to continually educate oneself.
- Interaction skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.): Work effectively with others. Provide leadership in a variety of situations.
- Deal with individual and/or group conflict.
- Information acquisition skills (i.e., written and electronic searches, databases, Internet, etc.): Independently research scientific and nonscientific information.
- Competently use library resources.
- Organizational skills (i.e., time management, project management, etc.): Manage time effectively. Facilitate group projects.
- Handle multiple tasks and pressures.

Maintaining a Student Status

All students are required to be registered during each semester of the degree program until the degree is conferred. Any interruption of continuous registration is considered a withdrawal. It is the student's responsibility to make sure s/he is registered. International students should contact the International Students and Scholars Office if they have any questions about maintaining a student visa status.

In Absentia Status

A student may petition for in absentia status only for legitimate academic (not personal) reasons, for instance; serving as an intern or performing research elsewhere. Application for in absentia registration is granted only if the student's program can best be fulfilled by work at an institution or location other than Cornell. Registration forms for students who will be registered in absentia (off-campus) should be completed and returned to the Graduate School before the start of the semester.

In absentia status will not normally be granted to students who have spent fewer than two terms of residence at Cornell. A request for in absentia status should be discussed in advance with the Graduate School staff to ensure that the student's proposal meets the criteria for in absentia status.

Students registered in absentia are considered, and must be, full-time students. They may not receive compensation other than fellowships, assistantships, or the equivalent.

- *Note:* International students planning to register in absentia should consult with the International Students and Scholars Office.
- *Residence units:* A PhD candidate may earn not more than two residence units, and a master's degree candidate not more than one, toward the fulfillment of the minimum residence requirements of that degree for work done in absentia. Professional degree requirements differ and are evaluated differently.
- *Health insurance:* A student registered in absentia may still be enrolled in the student accident and sickness insurance plan. Students should complete the insurance form attached to the in absentia petition.

Leaves of Absence Status

Students may request a leave at any time for personal or medical reasons.

- Leaves are granted for a period of up to 12 months; however they can be extended. Health Leaves of absence are automatically renewed upon request of the student. Personal Leaves are renewed at the discretion of the field.
- The maximum number of years allowed for a leave of absence is four. If the period of the leave has been exceeded, the student may re-apply for admission, but the Field is not required to re-admit. Students returning from approved health leave within the four-year window are guaranteed any financial support remaining from their original offer of admission, although the specific duties associated with that support may be adjusted.
- A student who takes a leave of absence may not receive payment in the form of a fellowship, teaching assistantship or graduate research assistantship and relinquishes access to campus facilities and personnel that normally accompanies student status.
- Time spent on leave of absence does not count toward time-to-degree limits.

Withdrawal

Students may withdraw from their program at any time. Withdrawal is appropriate for students who do not intend to resume studies or to complete an advanced degree at Cornell University. Any interruption of registration is considered a withdrawal unless the student has been granted a leave of absence.

Summer Registration

Graduate students must register with the Graduate School for the summer if they are receiving financial aid during the summer—e.g. fellowships, summer loans, assistantships, travel grants, or tuition awards, if they wish to use campus facilities, or if they are off campus but need to be registered for summer study.

Students who were registered with the Graduate School for one or both semesters of the preceding academic year may register with the Graduate School for the summer without charge, as long as they are not requesting registration units for summer study. To register, students enroll in the Graduate School's "Thesis/Dissertation Research" summer course via Student Center. When registration units are to be awarded for summer study, tuition must be paid for summer registration.

Change of Status Guidelines

Students in the MS degree programs may apply to enter the PhD program within Food Science & Technology using the Student Program Change form. Criteria used in evaluating a Program Change application are similar to those that would be considered by the admissions committee for any student initially applying to Cornell Food Science (i.e. academic progress, special project or research progress, etc.).

To apply for a program change, the following must be submitted to the Graduate Field Office:

- Student Program Change form, available at: https://gradschool.cornell.edu/forms/
- Statement of Purpose
- Letter from faculty stating he/she (1) is willing to chair your PhD program Special Committee, and (2) can provide funding for the duration of your PhD program

Examination Guidelines

Examinations for advanced degrees in the Field of Food Science and Technology serve three primary purposes:

- To assist the Special Committee and the graduate student in evaluating academic progress
- To maintain high academic standards for all students in the Field
- To provide students guidance and incentives for achieving academic excellence

Master of Science Examinations

MS Qualifying Examination "MS Q-Exam"

Objectives –

1. To evaluate the student's qualifications and potential for academic achievement in the program. These qualifications include competency in basic and applied sciences; ability to formulate, organize and express ideas; ability to critically evaluate the food science literature, ability to speculate intelligently; skills of written and oral communications; proficiency in the English language; and commitment to a career in the field of food science and technology.
2. To identify strengths and weaknesses in the student's background for the purpose of selecting a program of courses and other educational experiences best suited for the individual student. The Q exam is a field required examination; it is not a requirement of the Graduate School.

Timing – Students are expected to pass the qualifying examination prior to the beginning of the second semester of their M.S. program.

Scheduling and Results forms –

- At least one week prior to the exam submit the Schedule of Q Exam form to the Graduate Field Office AND provide all committee members with (1) a copy of the paper you are critiquing, (2) a 300-word summary of the paper, (3) a copy of your bachelor degree and Cornell transcripts, and (4) a reminder memo with date, time and location of the exam.

Format & Guidelines – Examiners will include all members of the student's Special Committee. In addition, all members of the Graduate Faculty of the Field of Food Science and Technology are invited to attend as non-voting examiners. The exam may be exclusively oral or both oral and written, at the discretion of the Special Committee, and will include questions pertaining to fundamental concepts and principles pertinent to the student's major and minor fields. The oral examination will also include a critical evaluation by the student of a paper from relevant research literature with the agreement of the committee chair (as of September 2014, the paper selected cannot be authored or co-authored by the student's committee chair or minor members). Prior to the exam, the student should choose a paper from the literature, critically read the paper and pertinent background materials, and prepare a concise summary of the paper and a short oral presentation. The summary should include the justification and objective(s) of the research, how it was done (methods), major results, and conclusions (200-300 words; this cannot just be a rephrasing of the abstract). The copies and summary of the paper should be given to the examiners at least 1 week prior to the exam. During the exam, the student will give a ten- minute "seminar" on the paper and then respond to questions related to the paper. Questions may include but are not limited to the following:

- Why did you choose the paper?
- What is the significance of the paper for the field of Food Science and Technology?

- Describe/explain key concepts/principles pertinent to the topic of the paper.
- What was the main question or objective addressed by the paper?
- Describe the research design. Was it adequate for answering the question addressed?
- Describe the methods used. Were they adequate?
- Summarize results and conclusions. Are the conclusions supported by the data?
- Describe flaws/pitfalls in the paper.
- Had you been directing the research described in the paper, what would you have done differently?
- What future research on this topic would you recommend?

If the exam is failed, a re-examination is allowable at the discretion of the Special Committee after at least three months have passed.

Following the exam, it is the responsibility of the student to deliver the signed examination form showing the results of the exam to the Graduate Field Office.

Final Examination for MS Candidates "MS Exam"

Objectives –

1. To evaluate the student's knowledge and understanding of subject matter pertinent to the Field of Food Science and Technology, the student's chosen area of concentration, and the student's minor subject.
2. To evaluate the quality and scientific merit of the thesis and to require the student to defend his or her thesis research.

Timing – Students may schedule this examination when they have completed all course work and their thesis is in near final form.

Scheduling and Results forms – The Graduate School thesis advisor has a packet of forms and information needed for students ready to schedule their final exam. Included in this packet is a scheduling of examination form. This form must be submitted to the Graduate School at least 7 days prior to the exam. Upon completion of the exam you must submit the completed results of examination form to the Graduate School. The Graduate Field Office will also need a copy of your exam scheduling form one week prior to your exam and a copy of your exam report form within three business days of the exam.

Format & Guidelines – Examiners will include all members of the student's Special Committee. In addition, all members of the Graduate Faculty of the Field of Food Science and Technology are invited to attend as non-voting examiners. The exam may be exclusively oral or both oral and written, at the discretion of the Special Committee. If the exam is failed, a re-examination is allowable at the discretion of the Special Committee after at least three months have passed.

Thesis – All members of the Special Committee must approve the thesis and an outline and draft should be given to them at least six weeks before the final exam. At least seven days prior to the exam, each member should receive a completed, typed copy of the thesis. After all of the changes specified at the exam have been made, and final approval has been obtained from the committee and Graduate School thesis advisor, two bound copies must be submitted to Graduate School for deposit with the University libraries, and one copy to the Graduate Field Office. Check with your committee to see how many copies of the thesis they will require.

Doctor of Philosophy Examinations

In order to better ensure that field expectations are being met, an additional field appointed member will be identified by the Graduate Field Office to represent the Field at Q and A exams. He or she will have full voting privileges. The purpose of this extra member is to determine that you be able to put your particular graduate program into the context of food science. This faculty member will be assigned to you when you begin your program. You will consider his or her calendar when scheduling your exam and include him or her in your materials distribution.

PhD Qualifying Examination "Q-Exam"

Objectives –

1. To evaluate the student's qualifications and potential for academic achievement in the program. These qualifications include competency in basic and applied sciences; ability to formulate, organize and express ideas; ability to critically evaluate the food science literature, ability to speculate intelligently; proficiency in the English language; and commitment to a career in the field of food science and technology.
2. To identify strengths and weaknesses in the student's background for the purpose of selecting a program of courses and other educational experiences best suited for the individual student. The Q exam is a field required examination; it is not a requirement of the Graduate School.

Timing – Students are expected to pass the qualifying examination prior to the beginning of the second semester of their Ph.D. program.

Scheduling and Results forms –

- When scheduling a date for the Q exam, be sure to include your field appointed member in the correspondence. He/she is required to attend the exam and must be allowed input on date selection.
- At least one week prior to the exam submit the Schedule of Q Exam form to the Graduate Field Office AND provide all committee members with (1) a copy of the paper you are critiquing, (2) a 300-word summary of the paper, (3) a copy of your bachelor degree and Cornell transcripts, and (4) a reminder memo with date, time and location of the exam.

Format & Guidelines – Examiners will include all members of the student's Special Committee and the field appointed member. In addition, all members of the Graduate Faculty of the Field of Food Science and Technology are invited to attend as non-voting examiners. The exam may be exclusively oral or both oral and written, at the discretion of the Special Committee, and will include questions pertaining to fundamental concepts and principles pertinent to the student's major and minor fields. The oral examination will also include a critical evaluation by the student of a paper from relevant research literature with the agreement of the committee chair (as of September 2014, the paper selected cannot be authored or co-authored by the student's committee chair or minor members). Prior to the exam, the student should choose a paper from the literature, critically read the paper and pertinent background material, and prepare a short oral presentation based on the paper. Copies of the paper should be given to the examiners at least 1 week prior to the exam. During the exam, the student will give a ten- minute "seminar" on the paper and then respond to questions related to the paper. Questions may include but are not limited to the following:

- Why did you choose the paper?
- What is the significance of the paper for the field of Food Science and Technology?
- Describe/explain key concepts/principles pertinent to the topic of the paper.

- What was the main question or objective addressed by the paper?
- Describe the research design. Was it adequate for answering the question addressed?
- Describe the methods used. Were they adequate?
- Summarize results and conclusions. Are the conclusions supported by the data?
- Describe flaws/pitfalls in the paper.
- Had you been directing the research described in the paper, what would you have done differently?
- What future research on this topic would you recommend?

If the exam is failed, a re-examination is allowable at the discretion of the Special Committee after at least three months have passed.

Following the exam, it is the responsibility of the student to deliver the signed examination form showing the results of the exam to the Graduate Field Office.

Examination for Admission to PhD Candidacy "A Exam"

Objectives –

1. To evaluate the student's knowledge and understanding of the subject matter pertinent to the Field of Food Science and Technology, the chosen area of concentration, and the two minor fields.
2. To evaluate the quality and scientific merit of the student's thesis research proposal.
3. To admit the student to PhD candidacy (students must be admitted to candidacy before they are eligible to present a doctoral thesis to the Graduate Faculty).

Timing – Students may take the A exam after successfully completing 2 units of residence credit. The A exam must be taken prior to the start of the seventh semester of residence in the PhD program.

Scheduling and Results forms – You must submit a scheduling of examination form to the Graduate School at least one week prior to your exam. Upon completion of exam you must submit the completed results of examination form to the Graduate School. The Graduate Field Office will also need a copy of your exam scheduling form one week prior to your exam and a copy of your exam report form within three business days of the exam.

Format/Guidelines – Examiners will include all members of the student's Special Committee and the field appointed member. In addition, all members of the Graduate Faculty of the Field of Food Science and Technology are invited to attend as non-voting examiners. The A exam will include a defense of the student's thesis research proposal and questions pertaining to the major and minor subject areas. The student must provide a copy of his/her proposal to each member of the Special Committee at least one week prior to the exam.

The specific format and content of the research proposal to be presented by the student at the A exam varies and is to be determined by the student and his/her committee. Students are strongly encouraged to discuss the proposal format with their committee chair at least 3 months before the A exam date and to also inform the other committee members of the intended format and content of the proposal.

Typical options for the proposal to be presented at the A exam include (i) a research proposal that covers the research a student will perform to complete the requirements for his/her PhD; (ii) a research proposal that relates to the students research project, but includes or focuses on objectives that will not necessarily be part of the student's PhD project; or (iii) a research proposal that focuses on a project unrelated to the

student's PhD project. Decisions on the proposal content are made considering a number of factors, including the student's career goals and the current status of his/her PhD project. Regardless of the content of the A exam proposal, a student is expected to complete a written proposal that will typically include sections on (i) background and literature review (ii) rationale and justification, and (iii) objectives and experimental design; if applicable the proposal may also contain a section on "Preliminary results."

Students are strongly encouraged to review a current request for proposals from a group that provides funding in their research area (e.g., USDA, NSF, NIH) and use a proposal format that would be required by one of these funding agencies; an appropriate proposal format should also be discussed with the student's committee chair. While the length of a typical proposal should be 10 – 15 pages (single sided, single spaced, not counting the space needed for references), specific expectations for proposal length also need to be discussed between the student and his/her committee at least 3 months before the A exam date. Proposals should not exceed 15 single spaced pages, even though proposals shorter than 10 pages may sometimes be appropriate. If the exam is failed, a re-examination is allowable at the discretion of the Special Committee after at least three months have passed.

Final Examination for PhD Candidates "B-Exam"

Objectives –

1. To evaluate the scientific quality of the PhD Dissertation.
2. To assess the candidate's ability and preparation for a career as an independent scientist.

Timing – It is expected that all requirements for the PhD degree, including passing the B exam and filing the dissertation be completed within seven years after the first registration in the Graduate School. Candidates must earn two additional residence units between the "A" exam and the "B" exam.

Scheduling and Results forms The Graduate School thesis advisor has a packet of forms and information needed for students ready to schedule their final exam. Included in this packet is a scheduling of examination form. This form must be submitted to the Graduate School at least seven days prior to the exam. Upon completion of exam you must submit the completed results of examination form to the Graduate School. The Graduate Field Office will also need a copy of your exam scheduling form one week prior to your exam and a copy of your exam report form within three business days of the exam.

Format/Guidelines – Examiners will include all members of the student's Special Committee. In addition, all members of the Graduate Faculty of the Field of Food Science and Technology are invited to attend as non-voting examiners. The "B" exam is oral and covers the topic of the PhD thesis. If the exam is failed, a re-examination is allowable at the discretion of the Special Committee after at least three months have passed.

Dissertation –All members of the Special Committee must approve the dissertation and an outline and draft should be given to them at least six weeks before the final exam. At least seven days prior to the exam, each member should receive a completed, typed copy of the dissertation. After all of the changes specified at the exam have been made, and final approval has been obtained from the committee and Graduate School thesis advisor, two unbound copies must be submitted to Graduate School for deposit with the University libraries, and one copy to the Graduate Field Office. Check with your committee to see how many copies of the dissertation they will require.

Program Assessment Plan for the Graduate Field of Food Science and Technology

The Graduate Field of Food Science and Technology at Cornell University has three degree programs (MPS, MS, and PhD) that each has a separate set of goals for student learning and separate set of procedures for gathering information on achievement of these goals. The information gathered through the procedures detailed here will be used to formally evaluate every program every three years in the January meeting of the Field of Food Science and Technology. The schedule for evaluation will include a formal evaluation of the MPS program in 2018, of the MS program in 2019, and of the PhD program in 2020. For each evaluation, the Director of Graduate Studies (DGS) and the Graduate Field Assistant (GFA) will summarize the information gathered and will present it to the Graduate Field. Based on the discussions at the field meeting and following a simple consensus building approach, the DGS will prepare a short written summary (1 page or less) that details actions that will be taken to improve the degree program that was reviewed. If desired by the Graduate Field a committee of three field members will be appointed to further improve and refine the evaluation of a given degree program and to develop approaches to improve a given degree program.

Assessment Plan for the Graduate Field of Food Science and Technology

Goals for Student Learning

When students complete the MS they should be able to:

1. Conduct guided original and publishable research
2. Demonstrate knowledge of theory and research across at least two sub-disciplines in the field.
3. Demonstrate in-depth knowledge of at least one area of expertise.
4. Follow ethical guidelines for work in the field.
5. Write and speak effectively to professional and lay audiences about issues in the field.
6. Demonstrate ability to serve as teaching assistant.

When students complete the PhD they should be able to:

1. Conduct original, publishable research in the field.
2. Demonstrate a broad knowledge of theory and research across several sub-disciplines in the field.
3. Demonstrate in-depth knowledge of one area of expertise.
4. Follow ethical guidelines for work in the field.
5. Write and speak effectively to professional and lay audiences about issues in the field.
6. For those entering teaching: grade and comment effectively on undergraduate student work, lead discussion and recitation effectively for undergraduates, demonstrate familiarity with the literature on learning and pedagogy, write a thoughtful teaching philosophy, and plan an effective undergraduate course in the field.

Collection of Information about MS Student Achievement of the Goals and Use of the Information

Measures	Goals	Use of the Information
The MS committee chair (major advisor) will complete an annual evaluation of every MS student, providing feedback on the student's progress in achieving the goals for student leaning	All	The DGS reviews these reports annually for issues that need to be addressed. Every three years the DGS and the Graduate Field Assistant (GFA) will prepare summaries of the data, which will be presented and discussed at the January field meetings in 2014, 2017, etc.
The MS committee evaluates the student at both his/her MS Q exam and final exam for oral and written communications skills and ability to demonstrate knowledge of theory and research across sub-disciplines in the field of food science.	2, 3, 5	Reviewed by the DGS and reported to the January field meetings as detailed above
The MS thesis committee evaluates every thesis for originality, cogency of the theoretical and empirical work, and clarity of presentation	1, 2, 3, 4, 5	Reviewed by the DGS and reported to the January field meetings as detailed above.
The field tracks graduates' employment and placement for a period of at least 5 years post-graduation	2, 3	Reviewed by the DGS and reported to the January field meetings as detailed above.
The field tracks students' presentations and publications; this information will be collected through annual reports	1, 5	Reviewed by the DGS and reported to the January field meetings as detailed above.
Each faculty member with an assigned TA provides an end of semester evaluation of the TA.	6	Reviewed by the DGS and reported to the January field meetings as detailed above.

Rubric for Evaluation of MS Student Progress

The purpose of this evaluation is 2-fold: 1. To monitor the performance and progress of our students and 2. To develop evidence for assessing the quality of the MS program overall. This evaluation should be turned in to the Graduate Field Office after the MS Q and MS exams for each student. It is up to the committee members whether or not to share the evaluation with the student.

Choose rating (1, 2, 3, 4, or 5) that applies for each outcome category

Graduate Education Outcomes -- The student will be able to:	**1 (Unacceptable)**	**2 (Fair)**	**3 (Good)**	**4 (Very Good)**	**5 (Outstanding)**
Demonstrate knowledge of current research directions for the field of study.	Gaps in basic knowledge. Does not understand basic concepts, processes, or conventions of the discipline. Misrepresents, misses or misuses literature.	Displays a basic understanding of the field. Literature review is adequate but not critical.	Displays a strong understanding of the field.	Displays a solid understanding of the field. Uses appropriate, standard theory, methods and techniques. Some exploration of interesting issues and connections.	Demonstrates thorough mastery as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary. Demonstrates a deep understanding of relevant literatures.
Show effective oral communication skills.	Argument is weak, inconsistent, contradictory, unconvincing or invalid.	Provides basic results and answers. Clear and coherent.	Provides solid, expected results and answers. Clear and coherent.	Gives a solid argument with novel or fresh insights. Original with clear and coherent details.	Compelling, exciting, and persuasive. Has a point of view and a confident, independent, authoritative voice.
Respond adequately to questions posed.	Unable to articulate an argument.	Provides a coherent response with some logic gaps or inconsistencies.	Provides a clear response with few or no logic gaps or inconsistencies.	Shows understanding and mastery of subject matter.	Exhibits mature, independent thinking. Demonstrates command and authority over the material.
Display effective written communication skills.	Academic writing lacks structure and organization. Writing has extensive spelling and grammatical errors.	Writing is adequate. Structure and organization are weak but sufficient.	Well written and well organized.	Very well written and organized, with attention to detail.	Concise, elegant, engaging, interesting, sophisticated, and original. Connects components seamlessly.
Effectively frame or communicate the student's current research.	No independent research. Question or problem is trivial, weak, unoriginal, or previously solved.	Demonstrates competence but is not very original or significant. Displays little creativity, imagination, or insight.	Demonstrates competence. Has some original ideas, insights, and observations.	Has a compelling question or problem. Argument is strong, comprehensive, and coherent. Has original ideas, insights, and observations.	Argument is focused, logical, rigorous, and sustained. Proposed project is original, ambitious, creative, significant, and thoughtful. Asks new questions or addresses an important question or problem.

Rubric for evaluation of Thesis/Dissertation

The purpose of this evaluation is to develop evidence for assessing the quality of the thesis. This evaluation should be turned in to the Graduate Field Office after completion of the MS exam for each student. It is up to the advisor whether or not to share the evaluation with the student.

Choose rating (high pass, pass, low pass, fail, no information) that applies for each outcome category

	HP	P	LP	F	n/i
The written thesis/dissertation is • Formatted in a manner appropriate to the discipline • Uses citations correctly and effectively • Is written in a professional style					
Research question is well-defined and objectives and hypotheses are clearly stated.					
Literature review is current, comprehensive, and provides the relevant context for the research.					
Literature is synthesized and evaluated critically in a manner that demonstrates a comprehensive understanding of the research question and its significance.					
Thesis/dissertation clearly and explicitly identifies and justifies the date requirements for answering the research question.					
Methods are technically correct and adequate for collecting and analyzing the necessary data. Methods are described in sufficient detail with adequate justification for: • Sampling/experimental design • Methods of data acquisition • Methods of data analysis • Inference					
Results are presented in a clear and understandable manner using appropriate format and level of detail.					
Tables and figures are used effectively.					
Thesis/dissertation applies a critical perspective to the results and conclusions with regard to strengths, weaknesses, technical limitations, limits to inference.					
Conduct of research and use of literature meets ethical standards.					

Collection of Information about PhD Student Achievement of the Goals and Use of the Information

Measures	Goals	Use of the Information
The PhD committee chair (major advisor) will complete an annual evaluation of every PhD student, providing feedback on the student's progress in achieving the goals for student leaning.	All	The DGS reviews these reports annually for issues that need to be addressed. Every three years the DGS and the Graduate Field Assistant (GFA) will prepare summaries of the data, which will be presented and discussed at the January field meetings in 2015, 2018, etc.
The PhD committee evaluates the student at his/her Q, A, and B exam for oral and written communications skills and ability to demonstrate knowledge of theory and research across several sub-disciplines in the field of food science.	2, 3, 5	Reviewed by the DGS and reported to the January field meetings as detailed above.
The PhD thesis committee evaluates every thesis for originality, cogency of the theoretical and empirical work, and clarity of presentation.	1, 2, 3, 4, 5	Reviewed by the DGS and reported to the January field meetings as detailed above.
The field tracks graduates' employment and placement for a period of at least 5 years post-graduation.	2, 3	Reviewed by the DGS and reported to the January field meetings as detailed above.
The field tracks students' presentations and publications; this information will be collected through annual reports.	1, 5	Reviewed by the DGS and reported to the January field meetings as detailed above.
Each faculty member with an assigned TA provides an end of semester evaluation of the TA.	6	Reviewed by the DGS and reported to the January field meetings as detailed above.

Rubric for Evaluation of PhD Student Progress

The purpose of this evaluation is 2-fold: 1. To monitor the performance and progress of our students and 2. To develop evidence for assessing the quality of the PhD program overall. This evaluation should be turned in to the Graduate Field Office after the Q, A, and B exams for each student. It is up to the committee members whether or not to share the evaluation with the student.

Choose rating (1, 2, 3, 4, or 5) that applies for each outcome category

Graduate Education Outcomes -- The student will be able to:	**1 (Unacceptable)**	**2 (Fair)**	**3 (Good)**	**4 (Very Good)**	**5 (Outstanding)**
Demonstrate knowledge of current research directions for the field of study.	Gaps in basic knowledge. Does not understand basic concepts, processes, or conventions of the discipline. Misrepresents, misses or misuses literature.	Displays a basic understanding of the field. Literature review is adequate but not critical.	Displays a strong understanding of the field.	Displays a solid understanding of the field. Uses appropriate, standard theory, methods and techniques. Some exploration of interesting issues and connections.	Demonstrates thorough mastery as well as creativity in drawing on multiple sources. Synthetic and interdisciplinary. Demonstrates a deep understanding of relevant literatures.
Show effective oral communication skills.	Argument is weak, inconsistent, contradictory, unconvincing or invalid.	Provides basic results and answers. Clear and coherent.	Provides solid, expected results and answers. Clear and coherent.	Gives a solid argument with novel or fresh insights. Original with clear and coherent details.	Compelling, exciting, and persuasive. Has a point of view and a confident, independent, authoritative voice.
Respond adequately to questions posed.	Unable to articulate an argument.	Provides a coherent response with some logic gaps or inconsistencies.	Provides a clear response with few or no logic gaps or inconsistencies.	Shows understanding and mastery of subject matter.	Exhibits mature, independent thinking. Demonstrates command and authority over the material.
Display effective written communication skills.	Academic writing lacks structure and organization. Writing has extensive spelling and grammatical errors.	Writing is adequate. Structure and organization are weak but sufficient.	Well written and well organized.	Very well written and organized, with attention to detail.	Concise, elegant, engaging, interesting, sophisticated, and original. Connects components seamlessly.
Effectively frame or communicate the student's current research.	No independent research. Question or problem is trivial, weak, unoriginal, or previously solved.	Demonstrates competence but is not very original or significant. Displays little creativity, imagination, or insight.	Demonstrates competence. Has some original ideas, insights, and observations.	Has a compelling question or problem. Argument is strong, comprehensive, and coherent. Has original ideas, insights, and observations.	Argument is focused, logical, rigorous, and sustained. Proposed project is original, ambitious, creative, significant, and thoughtful. Asks new questions or addresses an important question or problem.

Rubric for evaluation of Thesis/Dissertation

The purpose of this evaluation is to develop evidence for assessing the quality of the dissertation. This evaluation should be turned in to the Graduate Field Office after completion of the B exam for each student. It is up to the advisor whether or not to share the evaluation with the student.

Choose rating (high pass, pass, low pass, fail, no information) that applies for each outcome category

	HP	P	LP	F	n/i
The written thesis/dissertation is • Formatted in a manner appropriate to the discipline • Uses citations correctly and effectively • Is written in a professional style					
Research question is well-defined and objectives and hypotheses are clearly stated.					
Literature review is current, comprehensive, and provides the relevant context for the research.					
Literature is synthesized and evaluated critically in a manner that demonstrates a comprehensive understanding of the research question and its significance.					
Thesis/dissertation clearly and explicitly identifies and justifies the date requirements for answering the research question.					
Methods are technically correct and adequate for collecting and analyzing the necessary data. Methods are described in sufficient detail with adequate justification for: • Sampling/experimental design • Methods of data acquisition • Methods of data analysis • Inference					
Results are presented in a clear and understandable manner using appropriate format and level of detail.					
Tables and figures are used effectively.					
Thesis/dissertation applies a critical perspective to the results and conclusions with regard to strengths, weaknesses, technical limitations, limits to inference.					
Conduct of research and use of literature meets ethical standards.					

Forms

Almost everything you do will require a form (i.e. selecting committee, scheduling exams, filing for leave of absence, etc.). Below is a list of the most common forms:

Graduate School Forms (http://www.gradschool.cornell.edu/forms)

Certification of Enrollment (NetID required)
Conference Grant application (F6)
Course Enrollment Petition (R4)
Direct Deposit form for fellowship and assistantship stipends
Direct Deposit form for payroll
General Petition (A2)
In Absentia Petition (R5)
Leave of Absence (R6)
Provost's Diversity Fellowships (F1)
Request for Transfer of Registration Units (R8)
Research Travel Grant application (F7)
Schedule Master's Examination
Schedule A Examination
Schedule B Examination
Master's Exam Results Form
A Exam Results Form, Instruction, and Research Compliance Form
B Exam Results Form and Instructions
Student Program Change (R1)

Field of Food Science & Technology Forms (available from the Graduate Field Office)

MFS Academic Plan (FS02)
Q-Exam Scheduling Form (FS03)
Q-Exam Results Form (FS04)
Seminar Scheduling Form (FS05)
Seminar Completion Form (FS06)

Student Resources & Important Links

Grievance Procedures

The Grievance Procedure for Graduate Students Relating to Graduate Education and Support outlines general provisions and procedural steps for handling most grievances involving graduate students and faculty members, including issues such as academic integrity, remuneration, or joint publication. All conflicts should be dealt with in a patient, sensitive, and dignified manner. Detailed information about the grievance procedure is at https://gradschool.cornell.edu/policies/grievances-and-complaints/.

Grievance Procedure Specific to the Field of Food Science and Technology

If a graduate student contacts the Director of Graduate Studies (DGS), Graduate Field Coordinator, Department Chair or Associate Chair, or others in authority, about conflicts they are having with their Special Committee Chair, the following steps will take place:

1. If the graduate student is seeking advice, but not redress, then the person in authority can maintain confidentiality if requested by the student. Confidentiality or privacy will be maintained, unless this is specifically prevented by Title IX or Cornell Policy 6.4. In all instances, efforts will be made to mediate the conflict between the graduate student and the graduate advisor, and to find a mutually agreeable solution.

2. If the graduate student believes they were wronged and seeks redress (that is, an action by the Field and the Department to address the wrongdoing), they must file a grievance, in writing, with the Graduate Field Office according to Graduate School Grievance Policy.

3. The DGS will discuss the alleged grievance with the Department Chair & Associate Chair, and will discuss redress measures, commensurate with the situation. Examples of redress can include, but are not limited to:

    - The DGS or the Department Chair/Associate Chair will seek to mediate a resolution between the student and advisor
    - The DGS or the Department Chair/Associate Chair will actively contact other Field members to discuss their willingness to accept the student into their lab
    - The Department (Chair & Associate Chair), in consultation with the DGS, may allocate additional resources (e.g. GRAs) to the student or take other actions that would change the terms of the original offer letter made to the student. Such measures will only be taken in exceptional situations (i.e. the change causes exceptional hardship to the student or to the new faculty adviser).

    Note: Offers of redress that involve financial decisions can only be made by the Department (Chair / Associate Chair), in consultation with the DGS.

4. If the graduate student is not satisfied with the redress offered by the DGS and the Chair(s), they may continue the grievance procedure as outlined in the Step 3 of the Graduate School Grievance Policy.

The University Ombudsman
Staff in the Ombudsman's office is available to discuss any grievance that a graduate student may have. A student who feels he or she is being treated unfairly in any way may contact that office at 118 Stimson Hall, ombudsman@cornell.edu, 255-4321. Additional information can be accessed at *http://ombudsman.cornell.edu/*. The main purpose of the Ombudsman's office is to seek the just and equitable resolution of conflicts within the University. The office is independent of the University administration and all other groups on campus.

Cornell's Commitment to Diversity
Ever since Ezra Cornell and A.D. White joined forces to "found a university where any person can find instruction in any study," Cornell has been at the forefront of higher education in embracing students, faculty, and staff of both genders and of all backgrounds and ethnicities. To read more and view important links and other diversity resources, visit http://www.cornell.edu/diversity/.

Graduate School Code of Legislation
http://www.gradschool.cornell.edu/sites/default/files/field_file/Code%20Revisions_Final_May%202014.pdf
International Students and Scholars Office
http://www.isso.cornell.edu/

Complete List of Graduate School Forms
http://www.gradschool.cornell.edu/forms

Big Red Barn Calendar
http://www.gradschool.cornell.edu/life-cornell/big-red-barn

Graduate & Professional Student Organization
http://www.assembly.cornell.edu/index.php?n=GPSA.Home

Graduate Community Initiative
http://assembly.cornell.edu/GraduateCommunityInitiative/Home

Suggestions for Food Science Graduate Students Who Are Interested in a Minor in Applied Economics and Management

Prepared by

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The E.V. Baker Professor of Agricultural Economics
Department of Applied Economics and Management

Fall 2009

Basic Concepts and Strategies

You should be clear about the differences between Business, Agribusiness, and Economics; they are as important as the difference between Microbiology and Food Quality or Chemistry and Chemical Engineering.

If you have never had a course in economics or business (or very few and long ago), you should anticipate taking courses in these fields at the undergraduate level. JGSM offers some 5000-level courses that are also designed for students new to the fields of business.

Business-type courses can be found in AEM, ILR, Hotel and JGSM. Business courses tend to be based in the social sciences (chiefly economics and psychology) or quantitative methods (chiefly statistics but also mathematics and engineering). Very few fields of study are unique to business and have no "core discipline"; accounting is the best example.

Economics-type courses can be found in AEM, ILR, PAM and Economics. Economics is a social science that tries to understand human behavior from the perspective that people have desires that, in total, are insatiable given our constrained ability to acquire the goods or services needed to satisfy our desires. Business courses draw on various fields of study (e.g., accounting, marketing, finance, strategy, logistics) to better understand the tactics or techniques of businesses, processes of management, and the strategies and behaviors one confronts in commercial activity.

Most Food Science students are interested in business courses, not economics or social science courses. Hence, I will focus the remainder of this note on fields of study in business and possible strategies for a business-oriented minor.

In addition to any relevant previous coursework, what you want to get out of a "minor" in business is very important in guiding course selection. Several paths or goals are common among food science students, to wit:

1. You intend to have a career in food science, perhaps in R&D or quality control, and you primarily want to be able to better understand and work with future business colleagues who are involved in management, marketing, sales, operations, accounting and the like.
2. You intend to start your career in a more typical food science area, but you have a longer-term goal of moving into management.
3. You think that at some point you would like to start your own business.

Course Selection

Unlike some minor subjects, I do not approach a business-oriented minor as one in which a certain set of courses are required for one to claim some level of competency. Rather, I try to suggest specific courses that pertain best to your personal and career objectives.

At a minimum, I think you should take three courses if you want to claim a minor field. If you have the appetite and ability to take one or two more, that would certainly allow you to develop either more breadth or depth of your knowledge, but three courses is adequate.

Inasmuch as few Food Science students have any course background in business and probably very little, if any, in the social sciences, you will find that many of the courses I recommend are undergraduate courses. This should be acceptable to your advisor and is simply the sensible entry point for you in a new subject.

You will find that the Johnson Graduate School of Management offers some introductory courses that would be suitable to you and which are numbered at the 5000 level. Inasmuch as most MBA students did not major in business as an undergraduate, the content of these courses is very similar to upper level undergraduate courses in AEM or elsewhere. The primary differences between AEM upper level courses and JGSM courses of similar content are that AEM courses tend to be larger and, of course, have younger students. For a graduate student, the class room environment of a JGSM course is often more appealing, but if scheduling or other aspects of an AEM course appeals to you, you should not feel that you will learn less in an AEM course. The same could be said for an ILR course in Human Resource Management and for many Hotel courses.

Specific Course Advice

Accounting

I recommend a course in accounting to all students, regardless of their particular career interests. Accounting provides a framework and language that cuts a wide swath across business subjects and business careers. Accounting rules vary to some extent across countries, although there is a nascent move towards one international system. Students planning to work outside the US, especially in Asian countries, will find that some elements of more advanced accounting will be different, but the basic principles of a US accounting course certainly pertain in any setting. The differences would only matter for someone planning a career in accounting.

Specific courses in accounting that I recommend include:

NCC 5500 Financial Accounting

Fall or Spring. 3 credits. Prerequisite: non–Johnson School students.
Introductory accounting course that examines the subject from the viewpoint of users external to the organization. Topics include transaction analysis; the accounting cycle; financial-statement preparation, use, and analysis; revenue recognition and cost measurement; present value; and problems in financial-accounting disclosure.

NBA 5530 Accounting and Financial Decision Making

Spring. 3 credits. Prerequisite: non– Johnson School students.
Focuses on basic financial and managerial accounting and the economic and financial concepts that have a bearing on managerial decisions. The goals are to (1) give students a working knowledge of the accounting process and the value and limitations of the data that come out of the accounting information system; (2) familiarize students with key concepts in managerial accounting and the application of cost information to pricing and operating decisions; (3) promote an understanding of the use of economic theory in the evaluation of capital investment projects. The teaching methods consist of lectures and cases. Students are evaluated on the basis of exams.

AEM 2210 Financial Accounting

Fall or Summer. 3 credits. Priority given to CALS majors.
Comprehensive introduction to financial accounting concepts and techniques, intended to provide a basic understanding of the accounting cycle, elements of financial statements, underlying theory of GAAP, and financial statement interpretation. Topics include methods of recording inventory, receivables, depreciation, bonds, and equity. Requires two evening prelims and a comprehensive final; weekly homework assignments.

HADM 2223 Financial Accounting Principles

Fall or Spring. 3 credits. Prerequisite: non–Hotel undergraduates.
This course serves as an in-depth introduction to the principles of financial accounting, involving transaction analysis, flow of accounting data to the financial statements, and careful consideration of accounting for revenues, expenses, assets, liabilities, and owner's equity.

Any of these courses is perfectly satisfactory. I recommend the JGSM courses primarily because they will be taken mostly by older students and will have a smaller class-size. As the name and description implies, NCC 5500 focuses entirely on accounting, whereas the other JGSM courses includes some topics relevant to investment analysis. The AEM course is very good, but it is a very large enrollment course in the Fall. Accounting is very amenable to a summer format. Thus, if the timing works for you, taking AEM 2210 in the Summer can be a very nice way to get the material in an intense but short period of time. Summer enrollment is small.

<u>Marketing</u>

Food Science students who plan a career in product or process development or perhaps in quality assurance may find it advantageous to understand the process of marketing and sales and to be better able to interact with marketing personnel.

Students who think they might be interested in a later career move to marketing will find that it will likely require a detour to an MBA program at some point, but a marketing course now will help you develop a perspective on this as a future field of work. Of course, a basic understanding of marketing is a sensible component of a minor for someone with a general management interest as well.

Specific courses in marketing that I recommend include:

NCC 5530 Marketing Management

Fall or Spring. 3 credits. Prerequisite: non–Johnson School students.
Addresses controllable and uncontrollable marketing variables that managers in multi-product firms face in today's business environment. Topics include customer behavior, product planning, distribution, advertising and promotion, pricing, and competitive strategy.

AEM 2400 Marketing

Fall or Summer. 3 credits.
Provides a broad introduction to the fundamentals of marketing. Explores the components of an organization's strategic marketing program, including how to price, promote, and distribute goods and services. Industry guest lectures and current marketing applications from various companies are presented and analyzed.

These courses have a very similar content but a remarkably different context. The JGSM course will be much smaller in size and will have more upper division and graduate students than the AEM version.

Beyond the basic principles of marketing, this subject has two distinct branches. Quantitative marketing draws primarily on the disciplines of economics and statistics. Qualitative marketing draws primarily on the discipline of psychology. Food Science students who are interested in a social science perspective on consumer attitudes and choices with respect to product attributes that are subject to manipulation by food science may find a course in consumer behavior interesting. These courses typically list introductory marketing as a prerequisite, but it is conceivable that an instructor would allow a graduate student to take his/her course without it. You should visit with the instructor first, if you do not have the prerequisite.

Two specific courses on campus are:

AEM 3440 Consumer Behavior

Fall. 3 credits. Prerequisites: AEM 2400 or equivalent. Preference given to AEM majors.
Develops a useful, conceptual understanding of the problems and strategies associated with psychology behind consumer behavior. In doing so, the course provides frameworks that enable students to address these issues responsibly, systematically, and creatively.

HADM 6647 Consumer Behavior (also NBA 6260)

Fall. 3 credits. Elective. Limited to 25 graduate students.
This course helps students become better at understanding, predicting, and influencing consumer behavior. Topics include motivation, perception, learning, decision-making, attitudes, nonverbal communication, persuasion, compliance, geo-demographics, and psychographics. The practical implications of psychological principles will be emphasized. Specific applications will involve such areas as guest frequency programs, menu design, promotional strategy, personal selling, sales and marketing planning, and marketing research. Class time is used for discussions and application exercises as well as for the presentation of relevant information.

There are a few other marketing electives that may be of interest to certain students.

Students who have the time to devote to a one-year course, might find Dr. Wansink's lab course interesting. Dr. Wansink has an extensive lab based program in which he generally examines how people make food choices. He is especially interested in dietary, menu, and food choices as they relate to nutrition and health.

AEM 4020/4021 Food and Brand Lab Workshop

Fall and Spring. 6 credits total. Prerequisite: permission of instructor. B. Wansink
The purpose of the Food and Brand Lab Workshop is to provide students with an advanced opportunity to develop an advanced understanding of consumers by involving them in collaborative, theory-based research related to food. This course is focused on asking and answering the "why" questions behind consumer behavior. Fall-semester students will receive an "R" grade and then receive their grade for course in the spring semester.

Students who are interested in retail food markets may find the following course to be of particular interest.

AEM 4480 Food Merchandising

Spring. 3 credits. Prerequisite: junior or senior standing; AEM 2400. D. J. Perosio.

Covers merchandising principles and practices as they apply to food industry situations. Examines the various elements of merchandising such as buying, pricing, advertising, promotion, display, store layout, profit planning and control, and merchandising strategy. Considers the consequences of food industry trends and initiatives for other industry members, public policy makers, and consumers.

Students who plan to work in the dairy industry may find this course to be of interest,

AEM 3460 Dairy Markets and Policy

Spring. 3 credits. Prerequisites: junior, senior, or graduate standing. ECON 1110 or equivalent. S–U or letter grades. A. Novakovic.
Survey of topics related to the structure and performance of U.S. dairy markets and federal and state policies that regulate market activities.

Management

Various general management courses may be useful to students who think they might be interested in moving into a management position, or who might be interested in starting their own business.

One of the most basic management tools is human resource (or personnel) management. Appropriate courses are taught in JGSM, ILR and Hotel.

NCC 5540 Management and Leading in Organizations

Spring. 3 credits.
Ultimately, the goal of managers and leaders is to get things done in organizations. Most of that work is accomplished by effectively managing other people. Using text-based cases, video cases, audio cases, exercises, and readings, we will focus on the skills managers need to be successful. An important course goal is to help you hone your critical thinking and problem-solving skills. To this end, our case analyses will require you to take problems apart into their component parts, to uncover their root causes, and to develop workable solutions. I will introduce frameworks and models that will help you analyze organizational problems and generate appropriate solutions. Major content themes focus on motivating employees, understanding organizational design and organizational culture, persuading and influencing others, and managing change. The course is particularly relevant for students who (1) plan to work in corporations; or (2) intend to manage and lead firms; or (3) plan to work in the consulting industry; or (4) think about founding and/or owning start-up companies.

ILRHR 5600 Human Resource Management

Fall or Spring. 3 credits. Prerequisite: graduate standing.
Survey course designed to provide an introduction to concepts and topics in human resource management. Consideration is given to theories and applications involved in effectively managing people in organizations. Topics include recruitment, staffing, training, performance management, retention, compensation, international human resource management, and the legal environment. Emphasis is placed on exploring these issues from both strategic and tactical levels to increase organizational effectiveness.

HADM 2210 The Management of Human Resources

Fall. 3 credits. Elective. Prerequisite: non–Hotel students. Not open to freshmen.
Students engage in a practically oriented examination of the role of human resources management (HRM), starting with an introduction to the HR function and an analysis of the social, legal, international, and competitive factors influencing HRM. The course examines recruitment, selection, training, motivation, development, compensation, performance appraisal, and labor relations. The course assumes a managerial perspective and emphasizes class discussion and case analysis.

If managing a food processing facility is something you might be interested in, or if understanding physical facility management is something that might help you in a product or process development position, then an operations management course could be useful. Typically, such courses rely on statistics and some engineering principles and should not be taken unless you have some foundation in these areas.

NCC 5580 Managing Operations

Spring. 3 credits.
Operations Management is the design and management of the processes that transform inputs into finished goods or services. This course provides a foundation for understanding the operations of a firm. Our objective by the end of the course is to provide you with the basic skills necessary to critically analyze a firm's operating performance and practices. We will focus on how the "physics" of material, work and information flows, and the design and management of a firm's processes interact to determine a firm's cost structure and its ability to compete effectively in terms of non-cost measures such as quality, variety, and speed.

<u>Entrepreneurship</u>

A wide variety of courses are offered across campus that are designed for or appropriate to students who think they would like to start their own business. One that is especially oriented to science and engineering students is taught in JGSM.

NBA 5070 Entrepreneurship for Scientists and Engineers

Fall or Spring. 3 credits. Prerequisite: M.Eng., PhD, and MS students; priority given to seniors as undergraduates. G. Schneider.
Specifically designed for mentored independent study, this course is customized using streaming video, guest speakers, distance learning, and special lectures/tutorial sessions. Work is focused on a single project: students form a start-up team and follow a technical business idea of their own choosing through the process of developing and founding a business that can attract venture investors. Learn how high-technology ideas are converted into world-class businesses in venture-backed start-up companies as well as in new business development in existing companies. Tutorial sessions with professors apply lessons to the team business plan.

Selecting a Minor Adviser

AEM faculty who have a food or agricultural orientation are far more likely to be receptive to working with Food Science students than AEM business faculty. Because AEM faculty tend to have above average teaching and advising loads, the number of professors who are willing to take on a minor student from an unrelated field is going to be small. If you have a research plan that includes a business or economics component, you will garner more interest, but that is far more the exception than the rule.

Hotel may have more interest than I know about, but their faculty is VERY focused on hospitality industry issues, so a thesis topic that lends itself to that kind of application might be necessary to capture their interest. It is highly unlikely that a JGSM or ILR faculty member would be interested in serving as a minor member of a Food Science committee. If you have a very narrow interest, that matches a faculty member's very narrow interest, then a match is more likely.

n.b.
*Course descriptions are copied from the 2009-10 Courses of Study. It is always advisable to check the current course roster to make sure that a specific course will be taught in a given semeste*r.

NOTES: