ORGANIZATION OF THE PROGRAM

The Graduate Program in Food Science is an interdepartmental program that draws upon the faculty and resources of the Departments of Nutrition and Food Science, Animal and Avian Sciences, Cell Biology and Molecular Genetics, and Plant Science and Landscape Architecture. Opportunities exist for collaborative research with scientists at the Food and Drug Administration through the Joint Institute in Food Safety and Applied Nutrition. A Director selected from amongst its faculty on a term basis administers the Program. Presently, Dr. Y. Martin Lo, Assoc. Professor in the Department of Nutrition & Food Science, is the Director. The list of Food Science Graduate Faculty can be found on the Graduate Catalog website http://www.gradschool.umd.edu/catalog/faculty/fdsc.htm.

ADMISSIONS REQUIREMENTS

Applicants should familiarize themselves with the requirements and the policies/procedures of the University of Maryland Graduate School. They may do so by referring to The Graduate School Catalog, which may be obtained, on-line at http://www.gradschool.umd.edu

All applicants must take the Aptitude Test of the Graduate Record Examination (GRE-General Test). Minimum GRE scores of 500 on the verbal and 500 on the quantitative sections, 3.5 on the analytical section of the GRE, are required. A strong background in food science, physical, chemical or biological sciences, or engineering is highly desirable. Acceptance is based upon academic transcripts, three letters of recommendation, and a statement of career objectives and professional experience.

The Office of International Education Services evaluates academic credentials of international applicants before the Graduate Program in Food Science Education Committee may consider international applications. A minimum of a 3.0 undergraduate grade point average is required. International students must take the Test of English as a Foreign Language (TOEFL) and have a score of 575 or above on the paper based test (PBT) or 233 or above on the computer based test (CBT) (with a writing score of 4.0 or above) or a score of 100 and above on the internet based test (IBT) (with a writing score of 25 or above) to be qualified for full admission. International applicants must also submit documentation of adequate financial support for their studies. An additional requirement for admission is identification of a research advisor prepared to accept the applicant as an advisee.
APPLYING FOR ADMISSION

All applications for graduate studies at the University of Maryland are to be submitted to the Graduate School and to the Graduate Program in Food Science for review and recommendations. Applicants wishing to study in this program should mark their application FDSC. To be considered for admission to the Graduate School, each applicant must obtain and complete the application form. An application may be obtained through http://www.gradschool.umd.edu or by email to grschool@deans.umd.edu.

To be qualified for admission consideration, all application materials along with the application fee should be received by the following deadlines:

- Admission to the Fall Semester: December 15.
- Admission to the Spring Semester: June 1.

NOTICE OF ACCEPTANCE

After the receipt of all required application material for admission into the Program, the Graduate Program in Food Science, Graduate Education Committee evaluates each applicant. The Graduate Education Committee makes recommendation regarding admission to the Director of the Graduate Program in Food Science. Official letters of offer of admission (or rejection) are made by the Dean of the Graduate School based on recommendation of the Director of the Graduate Program in Food Science and will be one of the following:

1. Admission to Full Degree (without condition)
2. Provisional Admission or
3. Admission denied with reasons stated.

An informal letter is also sent to each student by the Program Director, outlining any provisions for admission and designating a faculty advisor to assist the student in making decisions pertaining to his/her program of study. The Director assigns a faculty advisor to each student on the basis of mutual interests. The faculty advisor guides the student in the choice of course work for the first semester and the selection of a Faculty Advisory Committee.

The advisor submits the names of the faculty members on the Faculty Advisory Committee to the Director who in turn forwards the same to the Graduate Education Committee for approval. Once approved, the Faculty Advisory Committee guides the student and also serves as the committee for the thesis/dissertation proposal, the final examination, and approval of the thesis/dissertation of the student.

Officially, the graduate student's dean is the Dean of Graduate Studies and Research, but responsibility for supervising graduate research and training is delegated to the Program.
The Director is assisted by a three-member Graduate Education Committee. Individual members of the program faculty serve a 3-year, staggered appointment on this committee. It has the following functions:

1. Develop curriculum and policy, obtain approval of the faculty and implement the same
2. Serve as the admissions committee to screen completed graduate applications and recommend candidates to the Director for admission
3. Approve the Faculty Advisory Committees of the students
4. Review the progress of the students individually on an annual basis; approve all matters of academic nature, e.g., change of advisor or a member of the Faculty Advisory Committee, attendance of seminars, and any matters of disciplinary nature.

The Program is housed within the Department of Nutrition and Food Science in Skinner Building, Room 0112.

The Program maintains equipment for conducting both basic and applied research through the individual participating faculty members. The facilities are located in the Departments of Animal and Avian Sciences, Cell Biology & Molecular Genetics, Plant Science and Landscape Architecture, and Nutrition and Food Science. There are also collaborative arrangements with the National Institutes of Health, Food and Drug Administration, and U.S. Department of Agriculture. The library facilities and resources are extensive. The resources of several national libraries, viz., the National Archives, the National Agriculture Library, the Library of Congress, and the National Library of Medicine, which are within ten miles from the campus, are also available to the students.

Teaching Assistants (TA's) in the Department of Nutrition and Food Science are assigned a desk in Room 3205 Marie Mount Hall as well as a mailbox in Room 0123 Skinner Building. Graduate students, who are not TA's, should discuss with their advisor whether desk space is available in the advisor's laboratory. Also, McKeldin Library offers a limited number of study carrels with desks, for which students may apply.

All students are expected to establish a University of Maryland email account through the University of Maryland Office of Information Technology at www.oit.umd.edu. This service is provided free of charge to the students. Email will be the primary means by which the Director communicates with the students in the program.
It is the responsibility of the graduate student to update their personal information (change of address, telephone number or email address). This may be done on-line at www.testudo.umd.edu/apps/saddr/. In addition to the update on Testudo, please notify the Academic Program Specialist in Skinner, Room 0112, of changes to personal information. Technical support for University email is available at www.helpdesk.umd.edu or 301-314-1500.

**FINANCIAL ASSISTANCE**

Financial support for graduate students is available on a competitive basis. The Department of Nutrition and Food Science offers a number of graduate teaching assistantships. A limited number of research assistantships are also available, which support students in the Graduate Program in Food Science.

Applications for teaching assistantships for the Fall semester are due by January 10 in the Department of Nutrition and Food Science Office for continuing students.

New student applicants who are interested in a teaching assistant position should complete the Merit-Based Award Form and return to the Graduate Program in Food Science office by January 10 to be considered.

All new International Teaching Assistants (ITAs) who are not native speakers of English are required by the University of Maryland to take part in the ITA Evaluation. This includes ITAs who may have been educated entirely in English and those with Bachelor and Master’s degrees from universities in English-speaking countries.

Decisions regarding teaching assistant positions are usually acted upon by March 31. Graduate Assistants receive a stipend plus health insurance. Tuition fees (up to 10 credits per semester) for teaching assistants are waived by the University. Programs in Biochemistry, Chemistry, and Cellular Biology and Molecular Genetics administered in the corresponding departments, also offer teaching assistantships to qualified FDSC students, and students are encouraged to submit applications for TA position to those programs.

A limited number of research assistantships are available from grant funds with the student assisting in the research supported under the grant. The research often may be applicable to the thesis or dissertation. The tuition for graduate research assistants is charged at the in-state rate; it often is paid directly by the supporting grant. Research assistantships generally are not awarded until after students have attended classes and are known to faculty.

The University offers a number of special support mechanisms for qualified minority students. Other types of financial aid are also available, including a work-study program, grants, fellowships, and loans. For more information regarding financial support please refer to the Graduate School website (www.gradschool.umd.edu).
PROGRAM REQUIREMENTS

Master of Science

Background Requirements:

Proficiency in Food Science must be demonstrated by satisfactory completion of course work in the following areas: food chemistry, food microbiology, food processing, and biochemistry. Background course requirements will normally be satisfied with completion of a BS degree in Food Science from an accredited institution. Students deficient in any of these areas will be required to complete coursework to fulfill these background course requirements.

Course Requirements:

1) A minimum of 30 semester hours of course work toward a graduate degree is required. This includes:
   • 6 hours of thesis-research credit (NFSC 799)
   • A minimum of 24 credit hours of course work exclusive of thesis research
   • At least 12 hours must be in course work designated for graduate students only (600-level courses).

2) Required courses (600-level courses):
   • 3 credit hours of statistics BIOM 601, or equivalent.
   • 2 credit hours of seminar (NFSC 699), only one seminar credit should focus on the thesis results.
   • 7 credit hours of advanced level courses in Food Science.

3) Additional course requirements for each student are decided by the student's Faculty Advisory Committee.

4) Attendance at the Food Science seminars each semester is required. Attendance at the Distinguished Speakers Seminar Series and Thesis Seminars are strongly recommended.

5) A minimum grade point average of 3.0 is required to maintain good standing and for graduation.

6) A residence of at least 2 semesters or their equivalent (4 semesters at half time) is required.

Thesis Requirements:

1) The thesis must demonstrate the student's ability to do independent and scholarly research and writing. An oral exam to defend the thesis research is held the semester that the student intends to graduate.

2) Thesis Proposal:
The student must present a written proposal for his/her research to his/her Faculty Advisory Committee. This proposal should be submitted to and approved by the Faculty Advisory Committee by the end of the student’s second semester in the Program. A suggested guideline of thesis proposal is available in Appendix A. The final written proposal will then be reviewed and approved by the Graduate Education Committee before the start of the student’s second year in the program. The Program Director will be notified in writing by the student’s advisor about the outcome of the thesis proposal presentation.

3) The thesis format of the student’s completed research should conform to The Thesis & Dissertation Manual of the University of Maryland. This manual contains the instructions for preparation of theses and dissertations and is available on www.gradschool.umd.edu.

4) Defense:
   • The student must also orally defend the completed thesis before his/her Faculty Advisory Committee.
   • The decision to accept the examination as satisfactory must be unanimous.
   • The student may present himself/herself for this oral examination only twice.
   • The report of the committee, signed by each member, must be submitted to the Dean of Graduate Studies and Research no later than the appropriate date as announced by the Graduate School, if the student is to receive a diploma at the Commencement ceremony for the semester in which the examination is held.

5) Presentation and Publication:
   • It is highly recommended that students present their thesis research results at least at one national scientific meeting.
   • The student must prepare a draft of a manuscript for submission to a refereed journal such as the Journal of Food Science. The draft should be reviewed by the advisor prior to clearing the student for graduation.

6) The Faculty Advisory Committee:
   • The Committee is comprised of a minimum of three members of the University of Maryland Graduate Faculty, two of whom must be members of the Graduate Program in Food Science Faculty.
   • The student’s advisor is the chairperson of the committee, and the remaining members are members of the graduate or adjunct faculty who are familiar with the student’s program of study.
   • Ideally this committee should be appointed by the end of the student’s first semester in the Program.
   • The Faculty Advisory Committee is also the thesis examining committee. The committee membership is approved by the Dean of Graduate Studies and Research, based on the recommendation of the Graduate Program Director and the student’s advisor.
   • The student must submit the form for the Nomination of Thesis Committee by the Graduate School to the Program Director at least 3 months prior to the thesis defense date.
Doctor of Philosophy

Background Requirements:

Students entering the doctoral program generally hold an MS and/or have met the course requirements for the Master's degree in Food Science. Students without an MS degree in Food Science are required to take at least three out of the five core-food science courses in order to meet the background requirements: NFSC 421 Food Chemistry, NFSC 450 Food and Nutrient Analysis, NFSC 430 Food Microbiology, NFSC 412 Food Processing Technology, and NFSC 414 Mechanics of Food Processing.

General Requirements:

1) Courses are chosen in consultation with the student's advisor and/or Faculty Advisory Committee. Supporting courses should provide the student with background work in relevant disciplines. Students who lack basic background courses in supporting areas will be required to take these courses at the University of Maryland.

2) A minimum of three seminar credits (NFSC 699) are required. One seminar will be related to the proposed research area, and another seminar on the dissertation results. In addition, all students are required to attend all seminars.

3) Doctoral students are required to take at least 9 credits of advanced Food Science coursework or their equivalents, of which 6 credits must be 600-level.

4) Twelve credits of Doctoral Dissertation Research (NFSC 898 pre-candidacy and NFSC 899 post-candidacy). Doctoral students are encouraged to present their results at least at one national scientific meeting. It is highly recommended that doctoral students submit at least one research publication to a peer-reviewed journal prior to the oral defense of his/her doctoral dissertation.

5) Teaching experience: Each student will assist in teaching of at least one course regardless of the source of financial support. International students must meet the English proficiency requirement of the Graduate School in order to be eligible for teaching. See the following site for ITA Evaluation details: http://www.international.umd.edu/mei/572.

Advancement to Candidacy:

A student must pass the candidacy qualifying exam in order to be a Ph.D. candidate. A student must have the initial proposal meeting within two years in the program with inputs from committee members on research design and be admitted to candidacy for the doctorate within five years after admission to the doctoral program and at least six months before the date on which the degree will be confirmed. Most students in Food Science advance to candidacy within three years after admission to the program.
Candidacy Qualifying Exam:

1) Submission of a written dissertation proposal of the student’s dissertation research to the committee at least 3 weeks before taking the oral candidacy exam. The format for the written proposal should follow that of a proposal for competitive external funding such as USDA, NIH or NSF. Please check with the current Request for Proposals (RFP) announced by the agencies for detailed information.

2) The candidacy qualifying exam consists of two consecutive parts:
   • An oral presentation of the dissertation proposal at the presence of the entire Faculty Advisory Committee.
   • A comprehensive exam that includes questions on the student’s core-food science related knowledge.

3) A second candidacy qualifying exam requires the approval of the Director of the Graduate Program in Food Science and the Dean of the Graduate School. If the student fails this second defense, or the second defense is not permitted, the student’s admission to the graduate program is terminated.

4) The Program Director will be notified in writing by the student’s advisor about the results of the proposal defense.

Dissertation Requirements:

1) Each doctoral candidate is required to orally defend his/her doctoral dissertation as a requirement in partial fulfillment of the doctoral degree.

2) The written format of the dissertation is to conform to The Thesis & Dissertation Manual of UMCP. This manual contains the instructions for preparation of theses and dissertations and is available online. Download the most current edition of Thesis and Dissertation Style Guide from the Graduate School. Submit your Completed Thesis Online.

Defense:

1) The student must orally defend the completed dissertation before his/her Faculty Advisory Committee.

2) A draft of the dissertation must be submitted to the Faculty Advisory Committee at least one week prior to the intended date of defense.

3) Two or more negative votes of the members of the examining committee constitute a failure of the candidate to meet the dissertation requirement. In cases of failure, it is required that the examining committee specify in detail and in writing to the Program Director, the Dean of Graduate Studies and Research, and the student, the exact nature of the deficiencies in the
dissertation and/or the oral performance that led to failure.

4) A second defense is permitted based on the committee’s recommendation, which results in termination of the student's admitted status if it is failed.

5) The report of the committee, signed by each member, must be submitted to the Director of the Graduate Program in Food Science and the Dean of Graduate Studies and Research no later than the appropriate date as announced by the Graduate School, if the student is to receive a diploma at the Commencement ceremony for the semester in which the examination is held.

Composition of Committee:

1) The doctoral candidacy examining committee and dissertation examining committee must consist of a minimum of five members, at least three of whom must be regular members of the University of Maryland at College Park Graduate Faculty, two of whom must be members of the Graduate Program in Food Science Faculty.

2) Individuals from outside the University system may serve on dissertation committees provided that their credentials warrant this service and they have been appointed as special or adjunct members of the UMCP Graduate Faculty. These individuals must be in addition to the minimum required number of regular members of the College Park Graduate Faculty.

3) Each committee shall have a representative of the Dean of Graduate Studies and Research. This individual, who is recommended by the Program Director, must be a regular member of the Graduate Faculty at the University of Maryland at College Park, and from outside the Graduate Program in Food Science.

4) At least three of the members of the doctoral candidacy examining committee for a student must continue to serve on the dissertation examining committee. Students are encouraged to have all five members continue service, if possible. In the event that three of the five members cannot continue service, the Director of the Graduate Program, in consultation with the Faculty Advisory Committee and the student's advisor, will recommend replacement committee members.

5) The form for the approval of Doctoral Candidacy Examining Committee by the Graduate Program in Food Science must be submitted to and approved by the Program Director four weeks prior to the candidacy exam.

6) The form for the Nomination of Thesis or Dissertation Committee by the Graduate School must be submitted at least four months prior to the dissertation defense and oral exam date.

7) The policy of the Graduate School for any extensions will be strictly adhered to.
ADVISING/MENTORING

1) Each student is assigned an advisor upon admission and is encouraged to meet with his/her advisor as soon as possible. The student and advisor are encouraged to explore mutual research interests and identify a research topic during the first two semesters. Every attempt is made to match student and faculty interests in the initial assignment of an advisor, however, students may find that their research interests do not match their initial advisor and may select another advisor with the approval of the newly selected faculty advisor and the Director of the Program.

2) Master's students are well advised to finalize their advisor and research topic within their first semester for a timely completion of their research and degree, and doctoral students are well-advised to finalize their selected completion of a research topic and advisor within the first three semesters for a timely completion of their research and degrees. All students should be advised that the research process always takes longer than they initially anticipate and should plan accordingly.

3) Graduate Student Annual Reviews (Appendix B) are required at the end of each year to ensure proper progress of the student’s research project.

4) Although there are few irreducible requirements of the Graduate Program in Food Science, the Program is intended to be flexible enough to accommodate many different areas of concentration in both course work and research. Consequently, each student's graduate experience will be tailored to best serve the intellectual and career goals of that student. This tailoring of the graduate program will be done in close consultation with the student's committee. The student should meet with the committee to plan course work, discuss thesis proposal, discuss research results, exams, and final defense of the research.

SEMINAR POLICIES AND REQUIREMENTS

M.S. Degree

A minimum of two credits of seminar (NFSC 699) is required and only one seminar should focus on the student's thesis research results. NFSC 699 will be offered in the spring semester. Students unable to give his/her seminar during the Spring semester should register, but an "I" will be given and then during the Fall semester a special seminar will be arranged; upon successful completion of the seminar the “I” grade will be changed to the appropriate letter grade.

Ph.D. Degree

A minimum of three seminar credits (NFSC 699) are required. One seminar will focus on the research proposal and one seminar on the dissertation research results. One seminar must be on a topic different from the dissertation.
The grading method for seminar (NFSC 699) is an "S" (Satisfactory), "I" (Incomplete) or "F" (Failure). If a student presents a seminar that is not satisfactory, the student could receive an "I" and then repeat the seminar. If it is still not satisfactory, an "F" would be given.

**IMPORTANT GRADUATE SCHOOL FORMS AND DEADLINES INFORMATION**

It is the responsibility of the individual graduate student to ensure that he/she meets all the appropriate Graduate Program in Food Science and Graduate School deadlines. It is a good idea to check these deadlines at the beginning of the academic year.

Please refer to the Graduate School website (www.gradschool.umd.edu) for information on:
- Graduate School deadlines
- Graduate School policies and procedures
- Graduate School Academics/Campus/Finances/Research/Academic Calendar
- Policies regarding degree time limits

If you need assistance in regard to a Graduate School Form, please contact the Academic Program Specialist in 0112 Skinner Bldg. or at (301) 405-4521.

All forms require the appropriate signatures from the Graduate Program in Food Science; therefore, please do not submit forms directly to the Graduate School.

The Graduate Program is responsible for maintaining an accurate graduate student file and must retain copies of all forms submitted to the Graduate School (this includes the Application for Graduation).

The following forms need to be filed with the Graduate Program in Food Science and the Graduate School in order to meet appropriate deadlines and adhere to the policies and procedures of the Graduate School:

**All Masters and Doctoral Students:**

- Application for Graduation is generally due by the 2nd week of classes in order to graduate for that semester.

**Masters Thesis Students:**

- Campus and Federal requirements stipulate very clearly that the appropriate Campus committees PRIOR to the initiation of the research must approve any research project using humans or animals. Please consult your faculty advisor for guidelines and appropriate department and university forms.
- Approved Program Form for Master of Food Science Program
- Nomination of Thesis Committee Form must be filed at least two months prior to the scheduled oral examination. (Please note: “Special Members” must be nominated by your committee chair and requires a separate procedure and longer approval time).
- Report of Examining Committee Form and two copies of thesis
Doctoral Students:

- Campus and Federal requirements stipulate very clearly that the appropriate Campus committees PRIOR to the initiation of the research must approve any research project using humans or animals. Please consult your faculty advisor for guidelines and appropriate department and university forms.

- Nomination of Dissertation Committee Form must be filed at least three months prior to the scheduled date of the oral examination. (Please note: “Special Members” must be nominated by your committee chair and requires a separate procedure and longer approval time).

- Application for Admission to Candidacy
Appendix A:

**Suggested Format for Research Proposal**

*Note: The research proposal must be done in consultation with the student’s advisor. All page numbers are approximate. Please double space (except for the references).*

**Title page** (1 page). Tentative title of research project. Student’s name Advisor and graduate committee members.

**Introduction** (1 page). Briefly state the situation that has lead you to choose this area of research and some key findings that others have found. State your overall objective or the main goal of your project (but do not include methods).

**Literature Review** (5-10 pages). Discuss the principal studies related to your project. Include headings for the various subtopics you discuss. If appropriate, consider including a graph, figure, or table to highlight key findings. Indicate how your study will build on what others have found. Include a 1-paragraph summary at the end of your literature review.

**Research Question(s)** (½ page). What do you intend to learn or to find out as a result of the research that you will conduct? State in the form of a question or list several questions. (Optional: you can also state a hypothesis pertaining to what you think your research results will show).

**Methods** (2-5 pages). Describe your study design, including what you intend to do, and how you will do it. For example, who will be the subjects? How will they be recruited? What surveys or assays will be used? How will you analyze your data?

**Expected results and limitations** (1 page). List with bullets.

**References** (at least 1 page). Single space each citation, but separate with a double space.

**Attachments** (optional). If you have a draft of a survey instrument that you are developing, or other documents relevant to your project, include them as attachments.

*Note: This proposal will become the foundation for the student’s thesis or dissertation.*
Appendix B:

Graduate Program in Food Science Annual Review of Student Progress Toward MS/PhD Degree

To be submitted by March 31 of each academic year

1. Student______________________________
2. Current GPA__________  (To remain in good standing a GPA of 3.0 must be maintained)
3. Courses completed towards the degree and the semester taken:
4. Courses currently enrolled in this Spring semester:
5. Course work that remain to be taken after the current Spring semester:
6. Members of my committee are: Advisor and Chair ________________________________
7. Has your committee met this academic year?  
   _____Yes 
   _____No
8. Has your committee approved your thesis proposal?  
   _____Yes 
   _____No If Yes, date of approval______________
9. Describe the progress that has been made in your thesis research over this academic year.
10. What are your research plans for the coming academic year?
11. Advisor’s recommendation and comments:

(Continue onto next page) (Annual review page 2 of 2)