

# **GRADUATE PROGRAM HANDBOOK**

**Department of Food Science**

**The Pennsylvania State University**

**Academic Procedures**

**Academic Year 2023-2024**



Department of Food Science  
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The Pennsylvania State University  
University Park, PA 16802

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## **INTRODUCTION**

**Welcome to the Department of Food Science!** Our strategic plan specifically states that the Department will be recognized internationally for innovative research in the context of graduate education, making you an integral part of our program.

This **Graduate Program Handbook** presents information important to students enrolled in the M.S. and Ph.D. programs in the Department. The Graduate School of The Pennsylvania State University has general requirements that every Penn State graduate student must satisfy for admission and the awarding of a M.S. or Ph.D. degree. In addition, each graduate major has specific coursework requirements, thesis research criteria, and established policies that are appropriate to the program. Procedures and rules have the goal of assuring uniform and high standards of performance, and it is the responsibility of each graduate student to become familiar with them.

Graduate education involves more than satisfactory completion of coursework and thesis requirements. Informal and frequent contact with the entire faculty and other graduate students is highly recommended. There are several opportunities for graduate students to get actively involved with the Department, College, and the University while they are in graduate school through participation on Departmental and University committees, the Food Science Club, Institute of Food Technologists, Graduate Students' Association, etc.

This handbook is intended to serve as a guide as you navigate through your graduate program. Your graduate advisor, committee, and I are here to guide your progress, but the ultimate responsibility for that program resides with you. Please let me know if you have any suggestions on this handbook.

I wish you much success as you embark on your graduate degree program.

Greg Ziegler  
Director of Graduate Studies

## DEPARTMENTAL EXPECTATIONS OF GRADUATE STUDENTS

### M.S. STUDENTS

A student in the M.S. degree program will be knowledgeable about the field of food science in general. This knowledge will be acquired primarily through satisfactory completion of required coursework and attendance at Departmental seminars. Additionally, our students will develop the ability to learn independently by determining, finding, and using necessary resources. Our students will also develop the ability to make decisions and judgments based on their knowledge. Furthermore, the student will be capable of addressing a research problem through a series of sustained, logical experiments and bring his or her work to a satisfactory conclusion in the form of a M.S. thesis. Finally, it is expected that the thesis research will be of publishable quality and, as a minimum, will be communicated through at least one oral presentation or poster session at a scientific meeting.

The learning outcomes for the M.S. degree in Food Science are:

1. **Know.** Graduates will develop a deep conceptual understanding of food chemistry, microbiology, engineering, nutrition.
2. **Critical thinking.** Graduates will be able to solve practical problems in the Food Science field.
3. **Research.** Graduates will demonstrate the ability to design scientific approaches to solve practical problems and to select appropriate methods of data analysis.
4. **Communicate.** Graduates will be able to accurately report the results of research data in field of food science through written and oral presentations.
5. **Professional practice.** Graduates will conduct themselves in an ethical and professional manner.

### Ph.D. STUDENTS

In addition to the expectations described above for our M.S. students, a student in the Ph.D. degree program will develop the ability to determine and conceptualize a research problem, design the scientific approaches and experiments to address it, and bring his or her work to a satisfactory conclusion in the form of a Ph.D. dissertation. Finally, it is expected that the dissertation research will be of publishable quality and, as a minimum, will be communicated through an oral presentation or poster session at a regional or national scientific meeting and through at least one publication in a peer-reviewed journal.

The learning outcomes for the Ph.D. degree in Food Science are:

1. **Know.** Graduates will develop a deep conceptual understanding of food chemistry, microbiology, engineering, nutrition.
2. **Critical thinking.** Graduates will be able to apply their knowledge to independently identify and define original research problems.
3. **Research.** Graduates will demonstrate the ability to design scientific approaches to solve unanswered questions and to select appropriate methods of data analysis.
4. **Communicate.** Graduates will be able to accurately report the results of research data in the field of food science through written and oral presentations.
5. **Professional practice.** Graduates will conduct themselves in an ethical and professional manner.

## REQUIREMENTS FOR A DEGREE IN FOOD SCIENCE

### GENERAL DEGREE REQUIREMENTS

**General Coursework Requirements:** Students receiving a M.S. or Ph.D. in Food Science must have satisfactorily completed (Grade C or above) FD SC 500A, FD SC 500B, FD SC 500C, FD SC 500D, and FD SC 501.

**Teaching Experience:** All Food Science graduate students have an academic requirement of obtaining teaching experience for their graduate degree. Non-Food Science graduate students advised by Food Science faculty members are expected to serve as TA's as if they were Food Science graduate students.

***It is the responsibility of all international graduate students to take the Penn State American English Oral Communicative Proficiency Test (AEOCPT) prior to their first semester in the program:*** <https://aplnq.la.psu.edu/programs/about-the-aeocpt/>. ***The Graduate Program Assistant (GPA) will register you for this exam.***

Graduate students in their first year are expected to register for FD SC 602, Supervised Experience in College Teaching, in preparation for a Teaching Assistant (TA) assignment beginning in year two. From the second year on, a graduate student can expect to TA once per year. Therefore, M.S. students completing the degree in two years would TA once during their degree program and a Ph.D. student completing the degree in three years would TA twice during their program.

During each Spring semester the GPA informs the Director of Graduate Studies (DGS) of the students eligible for a TA assignment. The DGS then solicits students' preferences for the courses they would like to assist with and faculty preferences for the students they would like to assist them. The DGS then makes tentative assignments based on the following criteria. Required courses with lab sections take priority. Both student and faculty preferences are considered accounting for our obligation to provide a quality experience to the undergraduates, hence your qualifications (research area) and past TA experience are important. Also considered is your anticipated graduation date to avoid a TA assignment in the last semester. If made aware of them, we try to avoid course conflicts and prefer you not TA for your research advisor(s). If you are unfamiliar with the courses, we suggest you start with the Undergraduate Bulletin at <https://bulletins.psu.edu/university-course-descriptions/undergraduate/fdsc/>. For information beyond that available in the Bulletin, e.g. a course syllabus, contact the course instructor or ask a colleague that has assisted with the course in the past. The DGS then discusses the tentative assignments with the Department Head to arrive at the final TA assignments for the coming academic year.

**Assistantships/Time Limitations:** Departmental Assistantship appointments are normally ½ time (20 hours/week, plus 9-12 credits) and made on an annual basis. Renewal of the assistantship is contingent on satisfactory academic progress.

**Grade-Point Average:** A minimum grade-point average of 3.0 for work done at the University is required for graduation (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-400/gcac-404-satisfactory-scholarship/>).

**Annual Review:** Each spring there will be a formal review of all students to ascertain progress through the program. The student will fill out the **Annual Graduate Student Evaluation Form (page 37)** and provide it to their advisor to complete, sign, and submit to the DGS.

**Thesis Research Seminar:** All Food Science graduate students are required to present a seminar on their completed research before their final defense. The presentation is to be 30-45 minutes in length with an abstract and bibliography made available to the audience. This presentation is viewed as a professional obligation to the Department and is considered a general FD SC graduate degree requirement. The seminar should be scheduled preferably during the weekly Departmental Seminar Series if possible. ***The scheduling of this seminar is administered by the student's advisor in conjunction with the Seminar Committee and the Graduate Program Assistant. Provide the GPA with an abstract at least two weeks prior to the scheduled seminar.*** The thesis research seminar will be evaluated by several members of the Graduate Faculty in Food Science using the rubric detailed in the **Defense Seminar Review Form (page 36)**. The

student and advisor should ask three faculty who are not on the student's committee to serve as evaluators. One evaluator may be a post-doc. The completed evaluations will be given to the GPA who will share them with the student. This evaluation is part of the on-going assessment of the Graduate Program in Food Science by the Graduate Program Committee (GPC) and is not part of the thesis defense.

**Electronic Submission of Dissertation and Thesis (ETD):** Electronic submission of the final dissertation (eTD) is a requirement for all graduate doctoral candidates at Penn State. Master's candidates must also submit the final thesis as an electronic document. Both should be submitted for formatting review and final submission by the Thesis Office deadlines (<https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/thesis-dissertation-performance-and-oral-presentation-deadlines-calendar/>). For information on formatting requirements and the submission process visit the eTD Web site (<https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/about-etds/>).

### **DUAL-TITLE DEGREE PROGRAMS**

For general information on Dual-Title Degree Programs: <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-208-dual-titles/>.

### **Clinical and Translational Science**

The Food Science Department participates in the Clinical and Translational Science Dual Title program. You can find the handbook with requirements of the program at <https://ctsi.psu.edu/education/dual-title-phd/handbook/>. ***A CTS graduate faculty member must be included on the doctoral committee and must participate in all doctoral milestones (qualifying exam, oral comp, defense).***

### **International Agriculture and Development**

The Food Science Department participates in the International Agriculture and Development (INTAD) Dual Title program. You can find the handbook with requirements of the program at <https://agsci.psu.edu/international/intad/degree-requirements>. ***An INTAD graduate faculty member must be included on the master's or doctoral committee and participate in all milestones (qualifying exam, oral comp, defense).***

## **GRADUATE SCHOOL POLICIES**

**Residency Requirement:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-601-residency-requirement-research-doctorate/>

**Credit Load:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-500/gcac-501-credit-load/>

**Credit Load for International Students:** <https://gradschool.psu.edu/graduate-education-policies/gsad/gsad-500/gsad-502-credit-loads-for-international-students/>

**Graduate Assistants:** <https://gradschool.psu.edu/graduate-education-policies/gsad/gsad-900/gsad-901-graduate-assistants/> & <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-800/gcac-804-termination-assistantships-inadequate-performance/>

**Continuity of Registration and Resume Study:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-500/gcac-514-continuity-registration-resume-study/>

**Leave of Absence:** <https://gradschool.psu.edu/graduate-education-policies/gsad/gsad-900/gsad-906-graduate-student-leave-of-absence/>

**Registration Requirements When Course Work Has Been Completed:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-500/gcac-515-registration-course-work-completed/>

**Time Limitations:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-610-time-limitation-research-doctorate/> & <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-632-time-limitation-research-masters/>

**Student Conduct and Performance Policies:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-800/gcac-801-conduct/>; <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-800/gcac-802-procedures-for-resolution-of-problems/>; <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-800/gcac-803-procedures-termination-unsatisfactory-scholarship/>  
<https://studentaffairs.psu.edu/support-safety-conduct/student-conduct/code-conduct>

**Transfer Credits:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-300/gcac-309-transfer-credit/> Not necessary for Ph.D. Program.

**Forms:** [https://gradschool.psu.edu/graduate-program-resources/graduate-school-documents-and-forms/graduate-enrollment-services-documents-and-forms/#Student\\_Forms](https://gradschool.psu.edu/graduate-program-resources/graduate-school-documents-and-forms/graduate-enrollment-services-documents-and-forms/#Student_Forms)

## **M.S. DEGREE REQUIREMENTS**

The graduate school requirements for the M.S. degree are described in detail in the Graduate Bulletin (<https://bulletins.psu.edu/graduate/programs/majors/food-science/>). The Food Science Faculty has determined additional general and specific requirements and recommendations. ***An overview of these requirements is presented on page 9.***

**Graduate Committee:** Any R or Q member of the Penn State Food Science graduate faculty may advise a master's student. In addition, the Department of Food Science requires an M.S. committee of at least three members, to include one additional member of the Food Science Graduate Faculty other than the adviser. If a minor has been selected, a faculty member representing the minor field must be appointed to the committee. ***Please complete the Master's Committee Appointment Signature Form (page 11) to appoint or revise the Master's Thesis Committee and provide to the GPA.*** M.S. students in consultation with their advisor shall establish a thesis committee by the end of their second semester in the graduate program. All graduate students shall have a minimum of 1 formal thesis committee meeting annually. This meeting will be reported as part of the ***Annual Graduate Student Evaluation (page 33)*** and will be a factor in determining if adequate progress to degree is being made.

**Thesis Seminar:** On completion of your thesis research and prior to the Final Thesis Defense, you will present a seminar to the Department. ***Arrange the date/time with the Seminar Committee/GPA and submit an abstract to the GPA via email at least two weeks prior to the seminar.*** The thesis seminar must be scheduled so that the student's committee can attend. ***(see page 4 for further details)***

**Thesis Defense:** A copy of your thesis must be given to each member of your committee two weeks prior to the scheduled Thesis Defense and a majority of the committee members must agree to proceed with the defense one week prior to the scheduled Thesis Defense. The thesis must be in the format acceptable for submission to the Graduate School. ***Confirm the date/time/room with the GPA at least two weeks in advance.***

***The M.S. Requirements Worksheet will be used as a guideline to ascertain if all requirements for the M.S. degree have been fulfilled and must be completed and submitted to the Graduate Program Assistant before the Thesis Defense can be scheduled. It is the responsibility of the student to ensure that all appropriate requirements for a degree have been met.***

**Electronic Submission of the Thesis (eTD):** ***Master's candidates must submit the thesis for formatting review and the final thesis as an electronic document by the Thesis Office deadlines:*** (<https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/thesis-dissertation-performance-and-oral-presentation-deadlines-calendar/>). For information on formatting requirements and the submission process visit the eTD Web site (<https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/about-etds/>).

**Graduation:** ***Students must apply for graduation via LionPATH by the Registrar's deadline.*** Students are required to schedule an exit interview with the Department Head via his Assistant (***exit interview questions page 37***) and complete the tasks on the ***Graduate Student Graduation Checkout Sheet (page 40)*** prior to departure from campus.

**Continuing onto Ph.D. Program after the M.S. Degree:** Students may consider continuing onto the Ph.D. program upon completion of their M.S. degree. To activate their application for the Ph.D. program a student must complete the *Resume Study/Change of Graduate Degree or Major application* in the online GRADS application system including an updated Statement of Purpose and a letter of recommendation from the student's advisor. ***Successful completion of the M.S. degree does not guarantee admission to the Ph.D. program (see page 22 for further details).***

## Department of Food Science M.S. Graduate Program Checklist

### Year 1

- \_\_\_\_\_ Obtain ID card, set up access/email account, complete pre-registration activities, obtain keys, attend orientation
- \_\_\_\_\_ Take AEOCPT Exam- *for international students only*, (prior to 1<sup>st</sup> semester; GPA will register you)  
<https://aplng.la.psu.edu/programs/about-the-aeocpt/>
- \_\_\_\_\_ Take Laboratory Safety and Laboratory Hazard Communication – University Park Laboratory Safety @ <https://ehs.psu.edu/training>
- \_\_\_\_\_ Schedule FDSC 500 A, B, C, and D, and FDSC 501
- \_\_\_\_\_ Schedule other 400 and 500 level courses in consultation with advisor
- \_\_\_\_\_ Schedule FDSC 600: Thesis Research (GPA will register you)
- \_\_\_\_\_ Appoint thesis committee (Submit Master’s Committee Appointment Form to GPA)
- \_\_\_\_\_ Annual Evaluation
- \_\_\_\_\_ Develop a coursework plan in consultation with thesis committee
- \_\_\_\_\_ Develop thesis proposal & present to thesis committee
- \_\_\_\_\_ Complete SARI (as part of FDSC 501 & RISE 500L)
- \_\_\_\_\_ Schedule FDSC 602

### Year 2

- \_\_\_\_\_ Serve as TA
- \_\_\_\_\_ Schedule other 400 and 500 level courses per your coursework plan
- \_\_\_\_\_ Schedule FDSC 600: Thesis Research (GPA will register you)
- \_\_\_\_\_ Write thesis & manuscript(s)
- \_\_\_\_\_ Activate “Intent to Graduate” the semester you plan to graduate (via LionPATH by deadline)
- \_\_\_\_\_ Submit Thesis for format review with Graduate School Thesis Office by deadline
- \_\_\_\_\_ Schedule Thesis Seminar with Seminar Committee/GPA (provide GPA with seminar abstract/zoom link & names of evaluators at least a week in advance)
- \_\_\_\_\_ Schedule Thesis Defense & submit MS Requirements Worksheet to GPA (inform GPA of date & time no later than one month prior to defense)
- \_\_\_\_\_ Submit thesis online for Committee, Department Head, & Thesis Office approval. (Due to the Department Head’s travel obligations, we recommend you inquire about his schedule prior to submitting thesis.)
- \_\_\_\_\_ Schedule Exit Interview with Department Head’s assistant
- \_\_\_\_\_ Complete Graduation Checkout List
- \_\_\_\_\_ Return keys, purchase card, and equipment. Complete ERS reports, vacate office

## WORKSHEET DESCRIBING HOW M.S. REQUIREMENTS WERE SATISFIED

*This form must be submitted to the Graduate Program Assistant, 217 Food Science Building, before Thesis Defense can be scheduled.*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Requirements listed here are in addition to Graduate Council policies listed under [GCAC-600 Research Degree Policies](#).

A minimum of 30 credits at the 400, 500, 600 or 800 level is required, with at least 18 credits in the 500 and 600 series, combined. There are 24 credits required in the following core courses:

Required Courses		Credits	Complete? List 400/500 courses taken
FDSC 500A	Fundamentals of Food Science - Microbiology	1	
FDSC 500B	Fundamentals of Food Science - Engineering	1	
FDSC 500C	Fundamentals of Food Science - Chemistry	1	
FDSC 500D	Fundamentals of Food Science - Nutrition	1	
FDSC 501	Research Methods in Food Science	2	
6 credits of other 500-level FDSC courses (3 credits of the requirement can be satisfied by 400-level Food Science courses with permission of the adviser.)		6	
6 credits of 400- or 500-level courses – must include Statistics (STAT 500 or equivalent)		6	
<b>Electives</b>			
The remaining 6 credits may be chosen from a list of approved electives maintained by the program.		6	
<b>Culminating Experience</b>			
FDSC 600	Thesis Research	6	
<b>Total Credits</b>		<b>30</b>	

**In addition, M.S. students are required to complete 1 credit of FDSC 602: Supervised Experience in College Teaching prior to the TA experience; however, this 1 credit cannot be counted towards the minimum 30 credits required.**

The M.S. degree also requires the formation of a master's committee, the writing of a satisfactory thesis accepted by the master's committee, the head of the graduate program, and the Graduate School, and the passing of a final oral examination.

Please also list the following:

- Date of MS Thesis Defense:
- Publications resulting from your thesis work (please list complete citation for articles published and also list titles and authorship of manuscripts planned or in preparation).
- Presentations at scientific meetings based on your thesis work (please list title and authorship on presentations, both oral and poster sessions, at regional or national scientific meetings).
- Awards (please list awards received at professional meetings and all scholarships and fellowships awarded during your graduate studies at Penn State).
- Please provide title and location of your employment after graduation.

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

**MASTERS COMMITTEE APPOINTMENT AND SIGNATURE FORM**

**Student Name:** \_\_\_\_\_

**Advisor(s):** \_\_\_\_\_

**Committee Chair**

\_\_\_\_\_  
Name Signature Date

**Committee Members**

\_\_\_\_\_  
Name Signature Date

\_\_\_\_\_  
Name Signature Date

\_\_\_\_\_  
Name Signature Date \_\_\_\_\_ (Optional)

**Please submit form to Graduate Program Assistant.**

## **Ph.D. DEGREE REQUIREMENTS**

The graduate school requirements for the Ph.D. degree are described in detail in the Graduate Bulletin (<https://bulletins.psu.edu/graduate/programs/majors/food-science/>). The Food Science Faculty has determined additional general and specific requirements and recommendations. ***An overview of these requirements is presented on page 18.***

The Doctor of Philosophy degree is the highest mark of achievement of the University for creative scholarship and research. Doctoral study develops the student's capacity to make significant contributions to knowledge. Except in special cases, a M.S. degree in Food Science is earned before pursuing a Ph.D. degree.

**English Competence:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-605-english-competence-research-doctorate/> ***Scheduled with the DGS during the first semester.***

All Ph.D. students must pass the English Competency Examination. The Food Science Department defines the level of speaking competency as the ability to convey scientific and general information in an understandable manner, and the level of writing competency as the ability to relate scientific information in clear and easy-to-understand language that uses correct English grammar, syntax, spelling, and punctuation. All Ph.D. students must take this exam, including domestic and international students.

The Director of Graduate Studies (DGS) will conduct the assessment of speaking and writing competency at the beginning of Fall and Spring semesters. Within the first month of their first semester in residence in the Food Science program, all new Ph.D. candidates will be asked to:

1. Write a one-page summary on a subject within Food Science in one hour to test writing competency. The Director of Graduate Studies will determine the topic and supervise the administration of this writing exercise. The writing will be evaluated by the Director of Graduate Studies.
2. Complete a half-hour oral interview with the Director of Graduate Studies to test speaking competency.

The Director of Graduate Studies will evaluate each candidate's performance within two weeks and report the outcome to the candidate.

### **Improvement of English Competency by Students with Deficiencies**

A Ph.D. candidate must satisfactorily complete both parts of the English competency examination. In case of unsatisfactory performance in one or more parts, a recommendation to take appropriate remedial course(s) will be made. Those students whose writing is judged below acceptable standards will be required to take one or more appropriate technical writing courses. Those students whose speaking is judged below acceptable standards will be required to take ESL 115G, 117G or 118G or other appropriate courses.

### **Attainment of Competency**

For candidates who performed unsatisfactorily during one or both parts of the English competency examination, assurance of acceptable writing and/or speaking competency will be based on a second evaluation of his/her performance on the written and oral portions of the Comprehensive Examination.

### **Request for Exemption from English Competency Examination**

The student must submit a one-page petition justifying the exemption to the Director of Graduate Studies along with evidence for speaking competency and writing competency. For example, the student may have published a research paper (in English) as primary author, and the student may have recently presented an oral presentation (in English) at a scientific meeting. A copy of the manuscript and presentation abstract should be attached to the petition. Furthermore, the student's major advisor will also be required to sign the petition. By signing the petition, the advisor is attesting to the fact that the student has attained a level of speaking and writing competency in English.

**Qualifying Examination:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-604-qualifying-exam/>. ***Must be scheduled with the Qualifying Exam Committee within 3 semesters of beginning the doctoral program.*** The primary purpose of the Qualifying Examination is to provide an early

assessment of whether the student has the potential to develop the knowledge, skills, and attributes the program has defined in its formal Learning Objectives, including evidence of critical thinking skills, necessary for a successful researcher in the disciplinary field.

### **Qualifying Examination Committee Composition**

The Ph.D. Qualifying Examination Committee (Committee) will be composed of four Food Science faculty members representing the diversity of disciplines within Food Science. Members will be appointed by the Head for a period of four years and will become Chair of the Committee in their fourth year. All Committee members will have equal rights and voting privileges. When a member of the Committee has a conflict of interest (e.g. advisor of the Ph.D. student being evaluated) that member will be responsible for finding a substitute within the Food Science Faculty in the field they represent and notifying the Committee and the student of the change. In the event the Chair of the Committee has a conflict of interest, the next senior member of the Committee will act as Chair.

### **Protocol and Evaluation**

***The Qualifying Examination must be taken within three semesters of entry into the doctoral program.***

All Ph.D. students must have a M.S. degree or have completed at least 18 credits of graduate coursework beyond a Baccalaureate degree, prior to taking the Qualifying Examination. Approximately two months before conducting the Qualifying Examination, the Chair of the Qualifying Examination Committee will ask all Food Science graduate students to inform the Chair of their intent to take the Qualifying Examination. Approximately one month prior to the Qualifying Examination, the Chair of the Qualifying Examination Committee will meet collectively with those students scheduled to take the Qualifying Examination to clarify the protocol and evaluation criteria.

The Qualifying Examination will be administered consistent with the policy of the Graduate School above.

What follows is a description of the specific evaluation criteria as developed by the Graduate Faculty in Food Science and administered by the Qualifying Committee under the direction of the Department Head, who is also Head of the Food Science Graduate Program.

The Qualifying Examination will be administered during January and May, preferably when classes are NOT in session. The chair of the Qualifying Committee will meet with the students in December and April to explain the procedures and expectations for the exam.

Before taking the Qualifying Examination, students should have knowledge of the following areas with an emphasis on principles/concepts rather than details:

1. The scientific method, including hypothesis development, basic experimental design, and methods of data analysis.
2. Scientific ethics and academic integrity.
3. How to effectively communicate scientific research information to a wide variety of audiences.
4. Principles of chemistry and biochemistry of foods, including food ingredients and food systems from raw materials to during and after processing.
5. Principles of food microbiology, including beneficial and detrimental aspects of microorganisms in foods, as well as methods used for detection, enumeration, and control of microorganisms important in foods.
6. Principles of nutrition with emphasis on aspects of human physiology and metabolism, nutrient intake and utilization, nutrition surveillance and dietary recommendations, and the impact of food intake patterns on health.
7. Principles of food engineering, including fluid flow and heat transfer, as applied to unit operations in food processing and manufacture.

Two weeks before the Qualifying Examination, the student shall submit to the Graduate Program Assistant the following:

1. A copy of the master's thesis and any relevant published work.
2. Transcripts of undergraduate and graduate course work.
3. Statement of purpose for Ph.D. studies (professional goals, major research interests and plan for completing Ph.D.).

4. A list of courses taken and to be taken at Penn State.

The materials will be made available for review by the Qualifying Examination Committee prior to the Qualifying Examination.

The Qualifying Examination will consist of an oral examination. The Qualifying Examination is used to evaluate a student's potential for Ph.D. research, including the student's ability to think critically, analyze research problems, and communicate means to approach and examine these problems. This examination serves to validate the transformation in the student's status from graduate student accepted to work toward the Ph.D. to graduate student recognized as a candidate for the Ph.D. in the Food Science Graduate Program. In general, as administered in the Food Science Graduate Program, this examination is designed to test two things: 1) the student's ability to engage in critical thinking within the field of food science, and 2) the student's knowledge in broad areas of the field, with an emphasis on understanding central principles and concepts rather than specific factual detail.

Two weeks prior to the Qualifying examination, the student will be given a research paper of broad relevance to Food Science. This paper will be selected by the Qualifying Examination Committee. An ideal research paper will describe food science research and be published in a core food science journal (e.g. *Journal of Food Science*, *Journal of Agricultural & Food Chemistry*, *Food Microbiology*, *Journal of Food Engineering*, *American Journal of Clinical Nutrition*). The research paper should be broadly comprehensible to all members of the Committee and should have some flaws that the student can identify and critique.

The exam will begin with the student presenting a **30-minute** critique of the research paper. The student shall share a copy of the presentation with the Qualifying Committee members. Students may use visual aids and notes, but a written draft that could be read from will not be permitted. After the presentation, the Committee will have the opportunity to ask questions regarding information presented in the paper, primarily to evaluate overall understanding of the work and how it is related to other areas in Food Science. The aim of these questions is to determine the student's ability to show a clear understanding of the data presented and to demonstrate competency in explaining research data to a scientific group in a logical and precise manner. It is expected that the student will have a thorough understanding of all aspects of the research paper including background literature and all methodology used.

#### **Decision of the Qualifying Examination Committee and Communication of Results**

The primary outcome of the examination is either pass, fail with an opportunity for a re-examination, or fail. To pass, the student must receive at least 3 out of 4 positive votes from the Committee. If the decision is to fail the student (less than 3 of 4 positive votes from the Committee) the Committee will then vote to determine whether the student may retake the Qualifying Examination. At least 3 out of 4 positive votes are required to allow a retake and, they must take the Qualifying Examination the following January or May. Students will only be given one opportunity to retake the Qualifying Examination. The result of the Qualifying Examination (pass, fail with the opportunity to retake, or fail with no opportunity to retake) will be communicated to each student immediately after their Qualifying Examination. Within a week after all the Qualifying Examinations are finished, each student taking the Qualifying Exam, their advisor(s), all members of the Qualifying Examination Committee, the Department Head and the Director of Graduate Studies will be notified in writing as to the outcome of the Qualifying Examination, whether the Qualifying Examination Committee perceived any specific deficiencies and what coursework and/or other work are recommended to remedy the perceived deficiencies.

Specifically, the Qualifying Committee will assess the following student abilities with the goal of determining the student's potential to successfully conduct independent research and complete a doctoral degree in food science:

1. Ability to identify the hypothesis, objectives, and major experiments in a peer-reviewed scientific publication.
2. Ability to identify the strengths and weaknesses related to the hypothesis, experimental approaches, and data interpretation.
3. Ability to place a particular study into the broader context of the scientific literature in terms of its significance to food and related science (the extent to which it advances the field, answers important long-standing questions, raises new questions), and industry and public health stakeholders (is the topic important to industry, public health, is it translatable beyond the laboratory).

4. Ability to outline experiments to extent or improve the studies reported in a particular peer-reviewed publication.
5. Ability to answer questions rooted in, but peripheral to, a particular peer-reviewed scientific study. The answers should demonstrate critical thinking, a broad knowledge of food science and related disciplines, and the ability to formulate an answer with incomplete information/expertise, and intellectual honesty (i.e. student is aware and forthcoming about what they know and what they do not know, and are willing to share that information with the committee).
6. Ability to summarize and effectively communicate study design, key findings, implications, and strengths and weaknesses of a particular study.

The Qualifying Committee will evaluate each student in terms of each of the above abilities and score them as Outstanding, Very Good, Acceptable, Marginal or Not acceptable. For the student to pass the examination, he or she should be Acceptable or greater in 5 of the 6 abilities.

Ability	Ability Description	Outstanding	Very Good	Acceptable	Marginal	Not acceptable
1	Structure of a study					
2	Strengths & weaknesses					
3	Significance & implications					
4	Future Studies					
5	Speculating/Hypothesizing					
6	Scientific Communication					

**Formation of Doctoral Committee:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-602-phd-committee-formation/> PhD students in consultation with their advisor shall establish a thesis committee within 1 month of completing the Qualifying Examination. **Please complete the Doctoral Committee Appointment Signature Form (page 20) to appoint and/or revise the Doctoral Committee and provide to the GPA for processing. This must be completed prior to scheduling the Oral Comprehensive Examination.** All graduate students shall have a minimum of 1 formal thesis committee meeting annually. This meeting will be reported as part of the **Annual Graduate Student Evaluation (page 33)** and will be a factor in determining if adequate progress to degree is being made.

**Oral Comprehensive Examination:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-606-comprehensive-examination-research-doctorate/> The examination is officially scheduled and announced by the Office of Graduate Enrollment Services following recommendation by the doctoral committee chair through the Department Head. **Confirm the date/time/room with GPA at least 3 weeks in advance for processing.**

The Ph.D. Comprehensive Exam is a thorough test of the student's knowledge and intellectual capability. The student is expected to demonstrate a mastery of Food Science and be able to utilize that knowledge to interpret research and creatively solve problems. **It should be noted by all students admitted into the Ph.D. program that according to the Graduate School, the graduate student has no official status as a doctoral candidate until the Oral Comprehensive Examination has been passed.**

The examination shall consist of both a written and oral section. The written portion will consist of a research proposal not to exceed 20 pages in length. The format and topic of the written proposal will be determined by the thesis advisor(s), in consultation with the committee and the candidate. The proposal will be distributed to each member of the student's committee at least two weeks prior to the oral portion of the examination.

The comprehensive examination is held in-person. The student, adviser, and all regular Ph.D. committee members (major field, outside field, outside unit, minor field) must be physically present for the examination. Special committee members are encouraged to be physically present but may participate remotely.

If a fully in-person examination is not possible due to extenuating circumstances, the Graduate Program Head may approve at their discretion the remote participation of the student and/or members of the committee. If the Graduate Program Head does not approve the request for remote participation, either the student or adviser may appeal to the Associate Dean for Research and Graduate Education of the College of Agricultural Sciences.

The oral examination should be comprehensive in nature and not merely focus on the student's thesis research (questions are not limited to the narrow subject matter under investigation). A favorable vote of at

least two-thirds of the members of the committee is required for passing. Based on the student's performance, the committee may recommend to the Dean of the Graduate School one of the following actions:

1. That the candidate be passed,
2. That the candidate be re-examined at a later date,
3. That the candidate be failed and dropped from the Ph.D. program.

Students who pass their comprehensive exam can register for FD SC 601 (Ph.D. dissertation full time) for zero credits. Tuition is not charged for this course but there is a Ph.D. Dissertation Fee.

**Thesis Seminar:** On completion of your thesis research and prior to the Final Oral Exam/Defense, you will present a seminar to the Department. **Arrange the date/time with the Seminar Committee/GPA and submit an abstract to the GPA via email at least two weeks prior to the seminar.** The thesis seminar must be scheduled so that the student's committee can attend. **(see page 4 for further details)**

**Final Oral Examination/Defense:** <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-608-final-oral-examination-research-doctorate/> The examination is officially scheduled and announced by the Office of Graduate Enrollment Services following recommendation by the doctoral committee chair through the Department Head. **Confirm the date/time/room with GPA at least 3 weeks in advance for processing.**

The final oral examination (dissertation defense) is held in-person. The student, adviser, and all regular Ph.D. committee members (major field, outside field, outside unit, minor field) must be physically present for the examination. Special committee members are encouraged to be physically present but may participate remotely.

If a fully in-person examination is not possible due to extenuating circumstances, the Graduate Program Head may approve at their discretion the remote participation of the student and/or members of the committee. If the Graduate Program Head does not approve the request for remote participation, either the student or adviser may appeal to the Associate Dean for Research and Graduate Education of the College of Agricultural Sciences.

**The Ph.D. Requirements Worksheet will be used as a guideline to ascertain if all requirements for the Ph.D. degree have been fulfilled and must be completed and submitted to the Graduate Program Assistant before the Final Oral Examination/Defense can be scheduled. It is the responsibility of the student to ensure that all appropriate requirements for a degree have been met.**

**Electronic Submission of Dissertation and Thesis (eTD):** Electronic submission of the final dissertation (eTD) is a requirement for all doctoral candidates at Penn State. The dissertation should be submitted for formatting review and for final submission for approval by the Thesis Office deadlines: (<https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/thesis-dissertation-performance-and-oral-presentation-deadlines-calendar/>). For information on formatting requirements and the submission process visit the eTD Web site (<https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/about-etds/>).

**Graduation:** **Students must apply for graduation via LionPATH by the Registrar's deadline.** Students are required to schedule an exit interview with the Department Head via his Assistant (**exit interview questions page 37**) and complete the tasks on the **Graduate Student Graduation Checkout Sheet (page 40)** prior to departure from campus.

## Department of Food Science Ph.D. Graduate Program Checklist

### Year 1

- Obtain ID card, set up access/email account, complete pre-registration activities, obtain keys, attend orientation
- Take AEOCPT Exam- *for international students only*, (prior to 1<sup>st</sup> semester; GPA will register you)  
<https://aplmg.la.psu.edu/programs/about-the-aeocpt/>
- Take Laboratory Safety and Laboratory Hazard Communication – University Park Laboratory Safety @  
<https://ehs.psu.edu/training>
- Schedule FDSC 500 A, B, C, D and FDSC 501
- Schedule other 400 and 500 level courses in consultation with advisor
- Schedule FDSC 600: Thesis Research if entering PhD without MS degree or if additional credits are needed to maintain fulltime status (GPA will register you)
- Develop a coursework plan in consultation with advisor
- Schedule Qualifying Exam/English Competency with DGS during first semester
- Schedule Qualifying Exam/Science Competency with Qualifying Exam Committee within 3 semesters (not including summer) of entry into the doctoral program
- Complete SARI (as part of FDSC 501 & RISE 500L)
- Schedule FDSC 602
- Annual Evaluation

### Year 2

- Serve as TA
- Schedule other courses per your coursework plan
- Schedule FDSC 600: Thesis Research if entering PhD without MS degree or if additional credits are needed to maintain fulltime status (GPA will register you)
- Appoint Doctoral Committee (Give form to GPA for processing; *must be submitted before oral comp exam can be scheduled*)
- Develop thesis proposal & present to committee
- Schedule Oral Comprehensive Exam with committee (Must inform GPA at least 3 weeks in advance for processing)

### Year 3

- Serve as TA
- Schedule FDSC 601:Dissertation (full time) if passed Oral Comp Exam (GPA will register you)
- Write thesis & manuscript(s)
- Activate "Intent to Graduate" the semester you plan to graduate (via LionPATH by deadline)
- Schedule Thesis Seminar with Seminar Committee/GPA (provide GPA with seminar abstract/zoom link & names of evaluators at least a week in advance)
- Schedule Thesis Defense (inform the GPA of date, time, and location one month prior to defense for processing)
- Submit thesis online for Committee, Department Head, & Thesis Office approval. (Due to the Department Head's travel obligations, we recommend you inquire about his schedule prior to submitting thesis.)
- Schedule Exit Interview with Department Head's assistant
- Complete Graduation Checkout List
- Return keys, purchase card, and equipment. Complete ERS reports, vacate office.

**WORKSHEET DESCRIBING HOW PH.D. COURSEWORK REQUIREMENTS WERE SATISFIED FOR STUDENTS ENTERING PH.D. PROGRAM WITH AN M.S. DEGREE**

*This form must be submitted to the Graduate Program Assistant before the Final Oral Exam/Dissertation Defense can be scheduled.*

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Requirements listed here are in addition to Graduate Council policies listed under [GCAC-600 Research Degree Policies](#).

Required Courses		Credits	Complete? List 400/500 courses taken
FDSC 500A	Fundamentals of Food Science - Microbiology <sup>1</sup>	1	
FDSC 500B	Fundamentals of Food Science - Engineering <sup>1</sup>	1	
FDSC 500C	Fundamentals of Food Science - Chemistry <sup>1</sup>	1	
FDSC 500D	Fundamentals of Food Science - Nutrition <sup>1</sup>	1	
FDSC 501	Research Methods in Food Science <sup>1</sup>	2	
6 credits of other 500-level FDSC courses (3 credits of the requirement can be satisfied by 400 level Food Science courses with permission of the adviser.)		6	
Students must have satisfactorily completed at least one 400 or 500-level course in statistics (i.e., STAT 500 Applied Statistics or equivalent), during their undergraduate or graduate program			
<b>Total Credits</b>		<b>12</b>	

<sup>1</sup> Not needed if student received credit for these courses during master's degree program at Penn State.

**In addition, Ph.D. students are required to complete 1 credit of FDSC 602: Supervised Experience in College Teaching prior to the TA experience; however, this 1 credit cannot be counted towards the minimum credits required for the degree.**

All doctoral students must pass a qualifying examination, a comprehensive written and oral examination, and a final oral examination (the dissertation defense). To earn the Ph.D. degree, doctoral students must also write a dissertation that is accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School. In addition, all Food Science Ph.D. candidates are assessed for English competency. International students who plan to be teaching assistants must also take the American English Oral Communicative Proficiency Test (AEOCPT).

Please also provide the following information:

- Date of Qualifying Exam
- Date of Oral Comprehensive Exam
- Date of Final Oral Exam/Dissertation Defense
  
- Publications resulting from your thesis work (please list complete citation for articles published and also list titles and authorship of manuscripts planned or in preparation).
  
- Presentations at scientific meetings based on your thesis work (please list title and authorship on presentations, both oral and poster sessions, at regional or national scientific meetings).
  
- Awards (please list all scholarships and fellowships awarded during your graduate studies at Penn State).
  
- Please provide title and location of your employment after graduation.

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

## Doctoral Committee Appointment Form Worksheet

**Student Name:** \_\_\_\_\_

**Advisor(s):** \_\_\_\_\_

**Committee Chair/Co-Chair\***

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

**Dissertation Advisor/Co-Advisor\***

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

**Major Program Members\***

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

**Outside Field/Unit Member(s)\***

\_\_\_\_\_  
Name

\_\_\_\_\_  
Program/Department

\_\_\_\_\_  
Name

\_\_\_\_\_  
Program/Department

**Minor Field Member(s)**

\_\_\_\_\_  
Name

\_\_\_\_\_  
Program

\_\_\_\_\_  
Name

\_\_\_\_\_  
Program

**Special Member:** A person who is not a member of PSU Graduate Faculty (and may not be affiliated with Penn State), but who is otherwise qualified and has particular expertise in the student's research area (**CV & statement explaining how this member's work will be beneficial to the student's research are required**).

\_\_\_\_\_  
Name

\_\_\_\_\_  
Program

\*Required Field

**Please submit form to Graduate Program Assistant who will obtain signatures & submit for processing.**

## **ENTRY INTO THE Ph.D. PROGRAM WITHOUT FIRST OBTAINING A M.S. DEGREE**

### **General Policy Statement**

Although most applicants to the Ph.D. program have already obtained a Master's degree in Food Science or a related program, the M.S. degree is not a prerequisite for entrance into the doctorate program. The Graduate Program Committee (GPC) will consider requests from exceptionally qualified students who have received or anticipate receiving a B.S. degree, and from students currently enrolled in the Food Science M.S. program who wish to transfer into the Ph.D. program without first completing the M.S. requirements. Final approval of all applications will be made by the Department Head upon recommendation of the GPC.

New applicants with only a B.S. degree or equivalent who are not accepted into the Ph.D. program may apply for entrance into the M.S. program. Accepted students who subsequently fail the Qualifying Examination with no opportunity for retake or who fail the exam twice, may transfer to the M.S. program. In this case, credits earned while enrolled in the Ph.D. program may apply to course requirements for the M.S. degree.

Current M.S. students who are not approved for transfer into the Ph.D. program may continue their M.S. studies without penalty. Accepted transfer students who subsequently fail the Qualifying Examination with no opportunity for retake or who fail the exam twice, may return to the M.S. program. In this case, credits earned while enrolled in the Ph.D. program may apply to course requirements for the M.S. degree.

### **Application Procedures**

New applicants who wish to enter the Ph.D. program with only a B.S. degree or equivalent must submit the following via the GRADS online application system:

- All information, test scores, and fees currently required for M.S. to Ph.D. applicants
- A section within the personal statement that describes his/her justification for bypassing the M.S. degree

Current M.S. students who wish to transfer into the Ph.D. program without first completing all M.S. requirements must complete the ***Resume Study/Change of Graduate Degree or Major application*** in the online GRADS application system and submit the following:

- Their original complete M.S. application file
- A letter written by the student that describes his/her justification for bypassing the M.S. degree
- A letter from the student's advisor

The student's advisor must provide a letter to the Graduate Program Committee recommending transfer. This letter would generally be submitted within two semesters after admission of the student into the M.S. program. A second letter of recommendation must also be provided by another faculty member from Penn State supporting the student's transfer into the Ph.D. program. This letter must be submitted to the GPC at the same time that the advisor's letter is submitted. It is suggested that this second letter be provided by a faculty member who has had the student in at least one graduate level course (400 level or above).

### **Recommendations**

It is strongly advised that applicants be informed of the procedural requirements and evaluation criteria necessary for passing the Qualifying Examination. <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-604-qualifying-exam/> These include taking the exam at the next available opportunity after official entry or transfer into the Ph.D. program (summer sessions do not count towards this requirement) and after having earned at least 18 credits earned in graduate courses beyond the baccalaureate.

**Note that according to the Penn State Graduate School, "the student has no official status as a doctoral student and no assurance of acceptance as a doctoral candidate until the Oral Comprehensive Examination has been passed."**

**WORKSHEET DESCRIBING HOW PH.D. COURSEWORK REQUIREMENTS  
WERE SATISFIED FOR STUDENTS ENTERING PH.D. PROGRAM  
WITHOUT AN M.S. DEGREE**

*This form must be submitted to the Graduate Program Assistant before the Final Oral Exam/Dissertation Defense can be scheduled.*

**Name:** \_\_\_\_\_ **Date:** \_\_\_\_\_

Requirements listed here are in addition to Graduate Council policies listed under [GCAC-600 Research Degree Policies](#).

Except in special cases, an M.S. in Food Science is earned before pursuing a Ph.D. degree. Although most applicants to the Ph.D. program have already obtained a master's degree in Food Science or a related program, the M.S. degree is not a prerequisite for entrance into the doctoral program. For students entering the Ph.D. program **without** having earned an M.S. degree in Food Science or related field, 12 additional credits are required:

Required Courses		Credits	Complete? List 400/500 courses taken
FDSC 500A	Fundamentals of Food Science - Microbiology	1	
FDSC 500B	Fundamentals of Food Science - Engineering	1	
FDSC 500C	Fundamentals of Food Science - Chemistry	1	
FDSC 500D	Fundamentals of Food Science - Nutrition	1	
FDSC 501	Research Methods in Food Science	2	
6 credits of other 500-level FDSC courses (3 credits of the requirement can be satisfied by 400 level Food Science courses with permission of the adviser.)		6	
Students must have satisfactorily completed at least one 400 or 500-level course in statistics (i.e., STAT 500 Applied Statistics or equivalent), during their undergraduate or graduate program			
<b>Additional Credits</b>			
FDSC 600		6	
Additional 400 or 500-level FDSC Courses		6	
<b>Total Credits</b>		<b>24</b>	

**In addition, Ph.D. students are required to complete 1 credit of FDSC 602: Supervised Experience in College Teaching prior to the TA experience; however, this 1 credit cannot be counted towards the minimum credits required for the degree.**

All doctoral students must pass a qualifying examination, a comprehensive written and oral examination, and a final oral examination (the dissertation defense). To earn the Ph.D. degree, doctoral students must also write a dissertation that is accepted by the Ph.D. committee, the head of the graduate program, and the Graduate School. In addition, all Food Science Ph.D. candidates are assessed for English competency. International students who plan to be teaching assistants must also take the American English Oral Communicative Proficiency Test (AEOCPT).

Please also provide the following information:

- Date of Qualifying Exam
- Date of Oral Comprehensive Exam
- Date of Final Oral Exam/Dissertation Defense
- Publications resulting from your thesis work (please list complete citation for articles published and also list titles and authorship of manuscripts planned or in preparation).
- Presentations at scientific meetings based on your thesis work (please list title and authorship on presentations, both oral and poster sessions, at regional or national scientific meetings).
- Awards (please list all scholarships and fellowships awarded during your graduate studies at Penn State).
- Please provide title and location of your employment after graduation.

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

## **FELLOWSHIPS AND SCHOLARSHIPS**

Each year the Department awards a significant amount of supplemental funding in the form of fellowships and scholarships to graduate students in food science. In the past only a few have taken advantage of this by applying via the College of Agricultural Sciences website at <https://agsci.psu.edu/students/scholarships>. All students in the College are encouraged to apply for scholarships. **You must complete the College of Agricultural Sciences Scholarship Application and for those scholarships requiring documented financial need you must complete the Free Application for Federal Student Aid (FAFSA) annually to be considered.**

### **Fellowships**

#### PMCA Graduate Fellowship

PMCA and the Pennsylvania State University seek students interested in conducting confectionery research while earning a graduate degree in food science at the Pennsylvania State University. Preferably the candidates will have some experience in confectionery manufacture. Individuals that have earned an undergraduate degree, have some confectionery experience and are interested in furthering their education should complete the formal application for admission (<https://pmca.com/research/penn-state-fellowship-in-confectionery-research/>) per the instructions provided.

#### Skip and Marilyn Rosskam Graduate Fellowship in Food Science

Consideration for this fellowship is given to full-time graduate students exhibiting academic excellence who have been admitted to the Graduate School at the University as candidates for a graduate degree offered in the Department of Food Science in the College of Agricultural Sciences, or successor department/academic unit. Each fellowship shall be awarded for one academic year and may be renewed for subsequent years providing the recipient continues to meet the conditions of eligibility.

### **Scholarships**

#### Donald V. Josephson and Stuart Patton Mentorship Award in Dairy and Food Science

This award is for graduate students and faculty members and will be awarded by the Head, Department of Animal Science and the Head, Department of Food Science on an alternating basis. Consideration for this award shall be given to all graduate students enrolled in the College of Agricultural Sciences and studying Dairy or Food Science

#### Earl and Veronica Casida Graduate Fellowship in Microbial Food Safety

Consideration for this fellowship shall be given to all full-time graduate students exhibiting academic excellence who have been admitted as candidates for a graduate degree in the Department of Food Science with a focus on microbial food safety. Endowed by Earl and Veronica Casida.

#### Edith and William B. Rosskam, II Memorial Scholarship in Food Science

Consideration for this scholarship shall be given to full-time graduate students enrolled or planning to enroll in a degree offered by the Department of Food Science, or successor department, in the College of Agricultural Sciences, or successor academic unit, who have achieved superior academic records or who manifest promise of outstanding academic success. Financial need may be a consideration but is not a requirement for eligibility of this scholarship.

#### Frank S. and Nina Cobb Grant-in-Aid

Consideration shall be given to all students currently enrolled or planning to enroll in the Department of Food Science who have achieved positive academic records or show promise of academic success and have documented financial need. Endowed by Frank S. and Nina Cobb. **\*\* DOCUMENTED FINANCIAL NEED REQUIRED**

#### Fred and Florence Jacobson Food Science Graduate Scholarships

Consideration shall be given to all full-time graduate students enrolled or planning to enroll in the Food Science major who are active participants in the Food Science Club, demonstrate superior academic achievement, and have documented financial need. Preference shall be given to students studying chocolate and confectionery. Endowed by Fred and Florence Jacobson. **\*\* DOCUMENTED FINANCIAL NEED REQUIRED**

Ira W. Minter Memorial Award

Consideration for this award shall be given to all full-time graduate students currently enrolled in the Department of Food Science who have demonstrated exemplary progress in the previous academic year. Preference shall be given to students whose studies relate to chocolate and confectionery science and technology.

Janet G. and Frank J. Dudek Graduate Scholarship in Food Science

Consideration for this scholarship shall be given to all full-time graduate students enrolled or planning to enroll in the Department of Food Science, College of Agricultural Sciences, who have achieved superior academic records or who manifest promise of academic success.

John and Jane Ziegler Graduate Award in Sensory Science

Consideration for this award shall be given to all candidates for a graduate degree in a program offered in the College of Agricultural Sciences, or successor academic unit, who have demonstrated excellence in scholarly achievement to research or creative accomplishment in the discipline of sensory science.

Professor Arun Kilara Memorial Graduate Student Award in Food Science

Consideration for this award shall be given to a graduate student pursuing a degree within the Department of Food Science who has demonstrated excellence in outreach teaching or who has assisted with dairy foods-related courses through outreach teaching events offered by the Department of Food Science in the College of Agricultural Sciences

Robert D. and Jeanne L. McCarthy Graduate Teaching Award and Graduate Scholarship

Consideration for the teaching award shall be given to all full-time graduate students who are currently enrolled in a degree program offered by the Department of Food Science, or successor department, and who have achieved superior teaching success. Consideration for the graduate scholarship shall be given to all full-time graduate students who are enrolled in a degree program by the Department of Food Science, or successor department, who have achieved superior academic records. For the scholarship, financial need may be a consideration but is not a requirement for eligibility.

### **Graduate Student Travel Award**

The Department Scholarships Committee is pleased to announce the Department's new Graduate Student Travel Awards program. The guidelines are as follows:

- Travel awards are limited to \$500 for domestic or international travel.
- Travel awards can be given once during their career for MS and twice for Ph.D.
- Travel awards can be given in addition to other support (i.e., on top of a travel award from the College, University, and/or external travel grant).
- The total amount of the award should not exceed the total cost of attending the meeting (including registration, travel, lodging, meal per diem, etc).
- Students who receive a travel award may be asked to present their talk or poster at a department-sponsored research event (e.g., seminar, internal poster session, etc).
- Travel award recipients are required to write a Thank You Note to the endowment donor(s) who generously provided the funds for your travel.
- The following application must be completed and submitted at least 30 days prior to travel.
- Travel award recipients must submit their expense report within 14 days of returning from travel otherwise the award is forfeited.

The online application is available here: <https://forms.office.com/r/BU4XUx211P>  
If awarded, students will receive email notification of the award with instructions.

**500 LEVEL FOOD SCIENCE COURSES BY SEMESTER****Even Years (2020, 2022, 2024)****Fall Semester**

- **FDSC 500A (1)** Fundamentals of FDSC-Micro (Dudley)
- **FDSC 500B (1)** Fundamentals of FDSC-Eng (Anantheswaran)
- **FDSC 521 (3)** Food Defense (Wee online)
- **FDSC 534 (1)** Readings in Ingestive Behavior (Hayes)
- **FDSC 555 (3)** Food Rheology (Harte)

**Spring Semester**

- **FDSC 500C (1)** Fundamentals of FDSC-Chem (Cockburn)
- **FDSC 500D (1)** Fundamentals of FDSC-Nutr (Keller)
- **FDSC 501 (2)** Research Methods in FDSC (Lambert)
- **FDSC 515 (3)** Sensometrics (Hopfer online)
- **FDSC 517 (3)** Microbial Genomic Epidemiology (Kovac)
- **FDSC 534 (1)** Readings in Ingestive Behavior (Hayes)
- **FDSC 525 (3)** Culture-Based Analysis of Microorganisms (Cockburn)

**Odd Years (2019, 2021, 2023)****Fall Semester**

- **FDSC 500A (1)** Fundamentals of FDSC-Micro (Dudley)
- **FDSC 500B (1)** Fundamentals of FDSC-Eng (Anantheswaran)
- **FDSC 521 (3)** Food Defense (Wee online)
- **FDSC 534 (1)** Readings in Ingestive Behavior (Hayes)

**Spring Semester**

- **FDSC 500C (1)** Fundamentals of FDSC-Chem (Cockburn)
- **FDSC 500D (1)** Fundamentals of FDSC-Nutr (Keller)
- **FDSC 501(2)** Research Methods in FDSC (Lambert)
- **FDSC 514 (3)** Food Physical Chemistry (Coupland)
- **FDSC 515 (3)** Sensometrics (Hopfer online)
- **FDSC 517 (3)** Microbial Genomic Epidemiology (Kovac)
- **FDSC 526 (3)** Microbial Physiology of Foodborne Organisms (Dudley)
- **FDSC 534 (1)** Readings in Ingestive Behavior (Hayes)
- **FDSC 511 (3)** Food Enzymes (Cockburn)

## FOOD SCIENCE GRADUATE COURSE DESCRIPTIONS

- 400. FOOD CHEMISTRY (4)** Chemical properties of food constituents as influenced by processing and storage. Selected experiments and demonstrations to illustrate chemical reactions of importance in foods. Prerequisite or concurrent: CHEM 202, BMB 211, BMB 212  
Coupland
- 404. SENSORY EVALUATION OF FOODS (3)** Sensory evaluation of food, methods of test analysis, panel selection and training, taste sensation theory, consumer testing methods. Prerequisite: STAT 250. Junior standing. Hayes
- 405. FOOD ENGINEERING PRINCIPLES (3)** Engineering principles of importance to food manufacturing, including units, dimensions, mass and energy balance, fluid flow, rheology, heat transfer, and psychrometrics. Prerequisites: MATH 110, PHYS 250  
Anantheswaran
- 406W. PHYSIOLOGY OF NUTRITION (3)** Physiological mechanisms involved in thirst and appetite, digestion, absorption, utilization of nutrients, respiration, and body temperature regulation. Prerequisite: B M B 211; Lambert & Keller
- 407. Food Toxins (2)** Microbiological and chemical aspects of food poisoning; toxicological principles; case histories and prevention of problems. Prerequisite: Senior standing in food science or related majors. Lambert
- 408. FOOD MICROBIOLOGY (3)** Significance of microorganisms in food commodities, microbial spoilage, food-borne infections, and intoxications; methods of preservation, processing, and control. Prerequisite: MICRB 201, 202. Dudley
- 409. FOOD MICROBIOLOGY LABORATORY (2)** Methods of isolation and detection of spoilage and pathogenic microorganisms in foods; effects of processing and preservation on survival of food microorganisms. Prerequisite: MICRB 202. Prerequisite or concurrent: FD SC 408. Kovac
- 410. CHEMICAL METHODS OF FOOD ANALYSIS (3)** Qualitative and quantitative determination of food constituents. Prerequisite: BMB 212, FD SC 400. Hopfer
- 411. MANAGING FOOD QUALITY (3)** Statistical tools for the control and improvement of food quality. Prerequisite: STAT 250. Ziegler
- 413. SCIENCE AND TECHNOLOGY OF PLANT FOODS (3)** Physical and chemical behavior of plant-based raw materials and ingredients, with emphasis on parameters influencing finished product quality. Prerequisite: FD SC 400, 405, 408, 410. Elias
- 414. SCIENCE AND TECHNOLOGY OF DAIRY FOODS (3)** Physical and chemical behavior of dairy-based raw materials and ingredients, with emphasis on parameters influencing finished product specifications. Prerequisite: FD SC 400, 405, 408, 410. Harte
- 415. SCIENCE AND TECHNOLOGY OF MUSCLE FOODS (3)** Physical and chemical behavior of muscle food commodities, with emphasis on muscle-based ingredients in formulated foods. Prerequisite: FD SC 400, 405, 408, 410. Mills
- 417. FOOD LAWS AND REGULATIONS (3)** Study of the laws, regulations, and policies that govern food regulation in the United States as they affect the work of food scientists and food companies. The emphasis is on federal laws and in particular regulation by the U.S. Food and Drug Administration, but also includes an overview of food regulation by other agencies. Wee
- 450. NEW PRODUCT DESIGN (3)** This course provides upper-level undergraduate students in the Food Science major with a formal learning experience in new product design (NPD). Azzara/Anantheswaran/Wee
- 460. FOOD SYSTEMS IN ITALY (1-3).** Food Science Study tour in Northern Italy. Course will compare food and agricultural systems between the US and Italy. Hopfer/Kovac
- 497. SPECIAL TOPICS (1-9)** Formal courses given infrequently to explore, in depth, a comparatively narrow subject which may be topical or of special interest. Several different topics may be taught in one year or semester. A specific title may be used in each instance and will be entered on the student's transcript.
- 500A. FUNDAMENTALS OF FOOD SCIENCE – MICROBIOLOGY (1)** Intensive overview of the field of Food Science with the focus on microbiology. Dudley
- 500B. FUNDAMENTALS OF FOOD SCIENCE - ENGINEERING (1)** Intensive overview of the field of Food Science with the focus on Food Engineering. Anantheswaran

- 500C. FUNDAMENTALS OF FOOD SCIENCE – CHEMISTRY (1)** Intensive overview of the field of Food Science with the focus on chemistry. Cockburn
- 500D. FUNDAMENTALS OF FOOD SCIENCE - NUTRITION (1)** Intensive overview of the field of Food Science with the focus on nutrition. Keller
- 501. RESEARCH METHODS IN FOOD SCIENCE (2)** Planning and conducting research in food science including: problem definition, experimental design, collecting and recording data, and effective communication. Lambert
- 511. ENZYMES IN FOOD (3)** In this course students will learn about the use and manipulation of enzymes in the food industry during processing and fermentation as well as those enzymes naturally present in food and present in spoilage organisms and food borne pathogens. Students will come away from this course with knowledge about the chemistry catalyzed by these enzymes and how they can be exploited and controlled in the food industry to achieve the desired food quality and stability. This will include deeper investigations into both key enzymes in food processing and those of particular relevance to the students; research through paper discussions and student-led discussions of relevant enzymes. Thus, students will finish this course better prepared not only to tackle enzyme-related challenges in the food industry, but also aspects of their own research projects that involve enzymes. Cockburn
- 514. FOOD PHYSICAL CHEMISTRY (3)** Physical principles underlying food structure and quality. Prerequisite: FD SC 400 or FD SC 500C Coupland
- 515. SENSOMETRICS (3)** Students in this course will familiarize themselves with different data analysis methods for analyzing uni- and multivariate data sets from the Sensory & Consumer Sciences. Hopfer
- 517. Microbial Genomic Epidemiology (3)** This course gives students an overview of the sequencing technologies and genomic sequence data analyses (e.g., sequence pre-processing, assembly) and demonstrates their application in the context of epidemiology (e.g., identification of single nucleotide polymorphisms and genes of interest). The course covers the concepts necessary to carry out comparative genomics analyses and interpret the results in the context of an outbreak investigation. These concepts are then applied in a practical sequence-analyses case study focused on the development of prokaryotic whole-genome sequence data analysis skills. Lastly, students are guided in the application of gained knowledge and skills through final projects. Kovac
- 521. FOOD DEFENSE: PREVENTION PLANNING FOR FOOD PROCESSORS (3)** Course prepares current and aspiring professionals to learn, recognize and apply measures to prevent intentional contamination of the food supply. Prerequisite: AGBIO 520 Wee
- 525. CULTURE BASED ANALYSIS OF MICROORGANISMS (3)** Students will be engaging in synthesis of knowledge and analytical work through learning about a variety of topics related to microbial culture and applying what they have learned to new systems, both within the course and their own research. Additionally, students will be designing their own microbial culture experiments, based on materials from lectures, labs, and their own research for one of the evaluations in the course. Cockburn
- 526. MICROBIAL PHYSIOLOGY OF FOODBORNE ORGANISMS (3)** A current literature-based course investigating the mechanisms by which foodborne bacteria (beneficial and pathogenic) grow, survive, and react to environments encountered in foods and during food processing. Dudley
- 534. (NUTRN 534) READINGS IN INGESTIVE BEHAVIOR (1)** Students lead discussion of original research in the field of ingestive behavior with a focus on food intake in particular. Hayes
- 555. FOOD RHEOLOGY (3)** This course provides a broad exploration of rheology in the context of food materials. Harte
- 596. INDEPENDENT STUDIES (1-9)** Creative projects, including nonthesis research, that are supervised on individual basis and fall outside the scope of formal courses. A specific title may be used in each instance and will be entered on the student's transcript. Multiple offerings may be accommodated by the use of suffixes a, b, etc. ***The student must have a GPA greater than or equal to 3.0 in order to register for FDSC 596 and should submit a CONTRACT FOR FOOD SCIENCE INDEPENDENT STUDIES COURSES (FDSC 596) FORM to the GPA (form on page 30).***
- 597. SPECIAL TOPICS (1-6)** Formal courses given on a special interest subject which may be offered infrequently; several different topics may be taught in one year or semester. A specific title may be used in each instance and will be entered on the student's transcript.
- 600. THESIS RESEARCH (on campus) (1-15)** *FDSC 600 cannot be taken for a letter grade. Contact GPA for registration.*  
A master's candidate is not required to register for the final semester to graduate or to make minor revisions to the thesis and/or to take a final examination for the degree, unless required to do so by the program. However, international students should be registered each semester to meet F-1 Visa requirement, including the semester they defend.

**601. Ph.D. DISSERTATION (full time) (0 credits)– Contact GPA for registration**Registration requirements for FDSC 601

## International Students

1. Ph.D. students who have passed their qualifying exam must be continually registered until the semester that they defend their thesis.
2. Students who need to be registered after they have passed their comprehensive exam, should register for FDSC 601.
3. To remain in the U.S. on a legal status after the defense, the student should apply for OPT/CPT. Students are urged to contact DISSA for appropriate guidance.
4. International students must retain their health insurance to retain their F-1 Visa status. If they would like to purchase insurance elsewhere, they must work with the Student Insurance Office to get approval.

## Domestic Students

1. Ph.D. students who have passed their qualifying exam must be continually registered until the semester that they defend their thesis.
2. Students who have passed their Comprehensive Exam should register for FDSC 601.
3. Students should be formally registered during the semester (including summer) they intend to defend their thesis.

**602. SUPERVISED EXPERIENCE IN COLLEGE TEACHING (1)**

Supervised and graded experience in the organization and conduct of lectures and/or laboratories at the undergraduate level and the evaluation and counseling of students. Preparation for performing TA duties.

**General Policy** - Enrollment in this course is limited to graduate students in their first year. Registration is limited to one credit per semester. Credit for this course shall be counted as a part of the normal credit load for all students (including those on assistantships). However, credit for this course shall not be counted when calculating the grade-point average or in fulfilling any specific credit requirement for the M.S. and/or Ph.D. degree.

**Teaching Assistant Selection** - The Head of the Department, in consultation with the Director of Graduate Studies and the faculty, is responsible for annual assignment of TAs. Students are asked to indicate their preferences for assignment and encouraged to provide information about their interests, background, and any previous instructional experience. Instructors of the various courses are also asked for their preferences for TAs. After the selection process, the TAs are informed of the assignment in a notification letter.

**Course Requirements** - Enrollment in FDSC 602 implies additional educational activity by the student. Duties carried out in the normal course of TA assignments are not sufficient to fulfill FDSC 602 requirements.

**Grade** - The grade for this course will be assigned by the instructor for FDSC 602.

**610. THESIS RESEARCH (off campus) (1-15)****611. Ph.D. DISSERTATION (part time) (0 credits)**

**Contract for  
Food Science Independent Studies Courses  
FDSC 596**

**Instructions for scheduling an Independent Studies Course:** Complete this form in consultation with the supervising course instructor. Submit completed form, including student and professor's signature, to the Graduate Program Assistant.

Student's Name: \_\_\_\_\_

PSU ID Number: \_\_\_\_\_

Instructor's Name: \_\_\_\_\_

Semester & Year of Registration: \_\_\_\_\_

Course Number & Title: \_\_\_\_\_

Number of Credits: \_\_\_\_\_

\_\_\_\_\_  
Student's Signature

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

Comments:

## SUGGESTED NON-FOOD SCIENCE COURSES THAT MAY BE USED TO FULFILL GRADUATE DEGREE REQUIREMENTS

The list is only a suggestion. Choice of courses is a decision based on input from advisor, committee members and the interests of the students.

### A. ENGINEERING

ABE 513	Applied Finite Element, Finite Difference and Boundary Element Methods
ABE 559	Agricultural and Biological Systems Simulation
ABE 562	Boundary Element Analysis
ABE 568	Food Safety Engineering
CH E 446	Introduction to Transport Phenomena
CH E 544	Transport Phenomena
CH E 545	Transport Phenomena I
CH E 546	Transport Phenomena II
ME 411	Heat-Exchanger Design
ME 420	Compressible Flow I
ME 421	Viscous Flow Analysis and Computation
ME 512	HEAT TRANSFER--Conduction
ME 513	HEAT TRANSFER--Convection
E MCH 560	Finite Element Analysis

### B. BIOCHEMISTRY/CHEMISTRY

BMB 400	Molecular Biology of the Gene
BMB 401	General Biochemistry
BMB 402	General Biochemistry
BMB 443W	Laboratory in Protein Purification and Enzymology
BMB 464	Molecular Medicine
BMMB 525	Proteins and Enzymes
CHEM 410	Inorganic Chemistry
CHEM 452	Physical Chemistry
CHEM 525	Analytical Separations
CHEM 526	Spectroscopic Analysis

### C. MICROBIOLOGY

MICRB 412	Medical Microbiology
MICRB 413	Microbial Diversity
MICRB 416	Microbial Biotechnology
MICRB 421W	Laboratory of General and Applied Microbiology
MICRB 422	Medical Microbiology Laboratory
MICRB 450	Microbial/Molecular Genetics

### D. NUTRITION

NUTR 445	Nutritional Metabolism-I
NUTR 446	Nutritional Metabolism-II
NUTR 451	Nutritional Throughout the Life Cycle
NUTR 452	Nutritional Aspects of Disease
NUTR 453	Diet in Disease
NUTRN 511	Maternal and Infant Nutrition
NUTRN 513	Atherosclerosis and Nutrition
NUTRN 514	Prostaglandins and Leukotrienes
NUTRN 515	Mathematical Modeling in Nutrition

### E. STATISTICS

AG 400	Biometry/Statistics in the Life Sciences
ENT 597G	Applied Statistics Technology
R SOC 573	Survey Data Analysis

STAT 460	Intermediate Applied Statistics
STAT 462	Applied Regression Analysis
STAT 480	Introduction to STATS
STAT 500	Applied Statistics
STAT 501	Regression Methods
STAT 502	Analysis of Variance and Design of Experiments
STAT 503	Design of Experiments

## F. OTHERS

AG BM 460	MANAGING THE FOOD SYSTEM
HORT 412W	Post-harvest Physiology
MAT SE 441	Polymeric Materials I
MAT SE 442	Polymer Synthesis
MAT SE 443	Introduction to Materials Science of Polymers
MAT SE 444	Solid State Properties of Polymeric Materials
MAT SE 501	THERMODYNAMICS OF MATERIALS

### Annual Graduate Student Evaluation Form

**Graduate student:** Please fill in the items below. This form will then go to your advisor(s) for their evaluation after which it will be returned for your signature and then forwarded to the Director of Graduate Studies.

Name of Student:

Advisor:

ID #:

Co-Advisor:

Sem/year started the FDSC program:

Degree Working Toward: MS    PHD

Ethics Training	Yes	No	If no, provide expected date of completion
Did you take & pass FDSC 501?			
Did you take & pass RISE 500L?			
If required, have you completed an IRB/IACUC protocol and was it approved?			Protocol #

Thesis Committee/Qualifying Exam	Semester/year		Result
List the date that you took or plan to take the PhD qualifying exam if applicable.			
Has a thesis committee been established?	Yes	No	Date of most recent meeting:
List members (or anticipated members):			
Have you completed coursework?	Yes	No	

Comprehensive Exam/Thesis Defense	Semester/year		Result
List the date that you took or plan to take the comprehensive exam, if applicable.			
Anticipated date of thesis defense			

**GPA (3.0 minimum) Current GPA:** \_\_\_\_\_

**TA requirement** (please list course(s) and the semester for which you have served as TA):

**List any publications/presentations made as a graduate student at Penn State:**

For publications: Authors. Year. Title. Journal. Volume(issue) pages. Contribution to the work. For presentation: Authors. Title. Meeting title. Meeting Location. Meeting Dates. Poster/Oral. Local/regional/national/international. Peer reviewed/invited?

\_\_\_\_\_  
Student Signature

\_\_\_\_\_  
Date

**Faculty advisor(s):** Please evaluate the progress that the graduate student has made over the past year of study in the following areas.

	Exceeds Expectations	Meets Expectations	Below Expectations
Academic Progress			
Ability to Work Independently			
Ability to Work in a Team			
Ability to Plan and Conduct Research			
Motivation and Effort			
Oral Communication Skills			
Written Communication Skills			

In summary, are you satisfied with this student's progress over the past year? Yes \_\_\_\_\_ No \_\_\_\_\_ If not, please explain:

Additional Comments/Remediation Plan:

\_\_\_\_\_  
Advisor Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Co-Advisor Signature

\_\_\_\_\_  
Date

**Graduate Student:**

I agree \_\_\_\_\_; disagree \_\_\_\_\_ with this evaluation. If not in agreement, the student may explain:



## Defense Seminar Review Form

Presenter:

Date:

The ability to clearly and succinctly present scientific findings in a seminar format is a skill all graduate students must master. Towards the end of their degree program, both M.S. and Ph.D students in Food Science are required to give a public seminar on their research project. During these, three faculty members not on the student's committee will be asked to provide feedback using the form below. One evaluator may be a post-doc. These evaluations will have no impact on the student's completion but will be used as part of the Graduate Program Committee (GPC) assessment to whether we are improving students' presentation skills over the course of their degree programs. These forms will be returned to the student.

- 1) Knowledge of field: The student demonstrated a command of literature in their field.
- 2) Background: Ability to build scientific story leading to statement of hypothesis.
- 3) Statement of hypothesis: Student clearly describes hypotheses to be tested. Alternatively, a clear statement of objectives was provided.
- 4) Critical analysis: Ability to support hypothesis and communicate alternatives; ability to describe experimental design and connect experiments into a complete story
- 5) Presentation skills: Maintains eye contact, speaks in a clear and understandable manner. Keeps appropriate pace and stays within time limits.
- 6) Quality of slides: Good mix of text and figures, free of spelling errors, animations used work properly, size of text is appropriate.
- 7) Communicate strengths and weaknesses: Ability to identify strengths and weaknesses in own arguments, and to propose alternate experiments.
- 8) Questions: Ability to answer questions clearly in understandable manner.

At the end of the Spring semester, the GPC will evaluate all forms completed for seminars given during the academic year and decide whether action is needed.

<b>Ability</b>	<b>Description</b>	<b>Outstanding</b>	<b>Very Good</b>	<b>Acceptable</b>	<b>Marginal</b>	<b>Not acceptable</b>
1	Knowledge of field					
2	Background					
3	Hypothesis/objectives					
4	Critical analysis					
5	Presentation skills					
6	Quality of slides					
7	Strengths and weaknesses					
8	Questions					

(optional): additional comments:

### Questions for exit interview with Department Head:

All questions, except for open-ended ones and simple yes/no, are measured on a 7-point Likert Scale, probing for degree of agreement.

Do you have a job or postdoc offer?  Yes  No

If so, where did the offer(s) come from, and did you accept?

What type of positions are you looking for (academia, government, industry, etc.)?

Academia  Government  Industry  Others (fill in)  \_\_\_\_\_

### Rate how much you agree with the following statements:

1. *In my job search process, I received sufficient support from the department and/or my mentor.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. *For MS graduates: My MS degree prepared me to independently design and conduct experiments that answer practical research questions.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. *For PhD graduates: My PhD degree prepared me to identify knowledge gaps and design experiments to solve unanswered questions.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. *I am confident in my abilities to select appropriate methods of data analysis.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. *There were skills that I did not acquire during my training*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OPEN-ENDED follow-up: *If applicable, elaborate which skills you did not acquire during your degree*

6. *I had access to appropriate facilities to conduct research.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OPEN-ENDED follow-up: *If applicable, elaborate which facilities you did not have access to*

*I had sufficient opportunities to present research in a national and/or international forum.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OPEN-ENDED follow-up: *If applicable, what opportunities would you like to have had?*

*I had sufficient opportunities to present research at group meetings and the Thursday seminar series.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*I feel confident to accurately present research findings in both written and oral formats.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*The graduate-level coursework provided breadth and depth in my graduate training.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*The 500A-D series adequately oriented me to the discipline of food science.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*I feel adequately prepared to enter a professional work place.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OPEN-ENDED follow-up: *If applicable, elaborate how you were not adequately prepared (examples)*

*The atmosphere of the department (e.g., collegiality, collaborative nature, diversity) was beneficial to my professional development.*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*I had an appropriate level of administrative support from the front office*

Disagree Very Strongly	Disagree Strongly	Disagree	Neither agree nor disagree	Agree	Agree Strongly	Agree Very Strongly
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

OPEN-ENDED: *What is your impression of your relationship with your mentor?*

OPEN-ENDED: *What is your impression of your relationship with other graduate students?*

OPEN-ENDED: *Is there anything you would change about your time here?*

OPEN-ENDED: *What are the best and worst aspects of this Department?*

## FOOD SCIENCE GRADUATE STUDENT GRADUATION CHECK-OUT LIST

Food Science graduate students should follow the procedures listed below before leaving the University to ensure that they are in good standing at the time of their departure. Please share this info with the Graduate Program Assistant.

**Student's Name:** \_\_\_\_\_ **Graduation Semester:** \_\_\_\_\_

**Have you activated your intent to graduate through LionPATH by the semester deadline?** \_\_\_\_\_

**Date of Thesis Defense** (schedule with Graduate Program Assistant at least 3 weeks in advance): \_\_\_\_\_

**Thesis/Dissertation Title:**

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**Please complete all obligations below with the assistance of those listed:**

**1. Advisor(s):**

- Complete oral presentation of thesis/dissertation
- Make arrangements for completion of thesis/dissertation
- Submit thesis/dissertation online for approval by deadline
- Complete PSU Transfer/Separation Checklist with advisor when GA terminated

**2. Finance Assistant:**

- Return Purchasing Card
- Submit all paperwork for P-Card, Travel expenses, petty cash, etc.

**3. Facilities:**

- Return all keys to Room 115 Ag. Admin. Bldg.
- Receive key deposit refund

**4. Department Head**

- Schedule Exit interview with Department Head (at least 7 days in advance w/DH's assistant)

**5. Forwarding address:**

**Employer Name & Address:**
