GRADUATE PROGRAM HANDBOOK

Department of Food Science

The Pennsylvania State University

Volume I
Academic Procedures

Academic Year 2014-2015

Department of Food Science
202 Food Science Building
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 and you are an integral part of our program.

This **Graduate Program Handbook** presents information important to students enrolled in the M.S. and Ph.D. programs within 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 objective 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 within the Department, College and the University while they are in graduate school through participation in departmental and university committees, Food Science Club, Institute of Food Technologists, Graduate Students' Association and so on.

This handbook is intended to serve as a guide as you navigate through your graduate program. The ultimate responsibility for the 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!

Swamy Anantheswaran
Graduate Program Coordinator
August 22, 2014

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. 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.

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. We further expect that upon graduation, the Ph.D. student will be an expert in the area of the thesis problem and will be well versed on related issues. 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 publication in at least one peer-reviewed journal.

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. Refer to Tables 1 - 3 for more information.

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 register for the Penn State American English Oral Communicative Proficiency Test (AEOCPT) their first semester. Register by calling the Program in English as a Second Language at 814-865-7365.

Assistantships/Time Limitations: Departmental Assistantship appointments are normally limited to two years (4 semesters + 2 summers) for a M.S. candidate and three years (6 semesters + 3 summers) for a Ph.D. candidate. Continued funding is considered on a case-by-case basis.

Grade-Point Average: A minimum grade-point average of 3.0 for work done at the University is required for graduation.

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. The scheduling of this seminar is administered by the student's advisor in conjunction with Juanita Wolfe or Svend Pedersen.

M.S. DEGREE REQUIREMENTS

The graduate school requirements for the M.S. degree are described in detail in the Graduate Bulletin. The Food Science Faculty has determined additional general and specific requirements and recommendations. An overview of these requirements is presented in Table 1.

Graduate Committee: Any member of the Penn State Food Science graduate faculty with at least assistant professor rank 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 Masters Committee Appointment Signature Form (see back of handbook) to appoint and/or revise the Masters Thesis Committee and file this form with either Juanita Wolfe or Svend Pedersen as soon as the committee is finalized or changed.

Thesis Seminar: Prior to the Final Oral Exam, student will present a seminar to the department. See Svend Pedersen to set up time and room for seminar and submit abstract to him via email (sep14@psu.edu) at least two weeks prior to the seminar. The student's committee should be invited to attend.

Final Oral Examination/Thesis Defense: A copy of your thesis must be given to each member of your committee two weeks prior to the scheduled Final Oral Examination. The thesis must be in the format acceptable for submission to the Graduate School. The majority of the committee members must agree to proceed with the defense, one week prior to the scheduled Final Oral Examination.

Electronic Submission of Dissertation and Thesis (ETD): Electronic submission of the final dissertation (eTD) became a requirement for all doctoral candidates at Penn State starting in fall semester 2006. Master's candidates now have the choice of submitting the final thesis either in the traditional paper format or as an electronic document. (It cannot be submitted as both.) Formatting requirements are essentially the same for a paper copy and an eTD, but the submission process itself is somewhat different . For additional information on the mechanics of eTD preparation, visit the eTD Web site (http://www.etd.psu.edu/).

Time Limitations: A Master's student must complete his/her program requirements within eight years of first enrollment as a Master's student.

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 form along with an updated Statement of Purpose, a letter of recommendation from the student's advisor to Svend Pedersen.

Department of Food Science
M.S. Graduate Program Checklist

Year 1

_____ Attend orientation, Get Keys, Set up Email account

_____ Take AEOCPT Exam for international students only, (during 1st semester)
http://aplng.la.psu.edu/academicPrograms/ita_whatIsAEOCPT.php

_____ Take Chemical and Hazardous Waste Handling Safety Course @ http://www.ehs.psu.edu

_____ Schedule FD SC 500 A, B, C, and D, and FD SC 501

_____ Schedule other 400 and 500 level courses in consultation with advisor

_____ Research

_____ Appoint thesis committee – see Master's Thesis Appointment Form in back of handbook

_____ Develop a coursework plan in consultation with thesis committee

_____ Develop thesis proposal & present to thesis committee

_____ Complete SARI (as part of FD SC 501)

Year 2

_____ Schedule FD SC 602 (along with your TA assignment)/Serve as TA

_____ Schedule other 400 and 500 level courses per your coursework plan

_____ Research

_____ Write thesis & manuscript(s)

_____ Activate "Intent to Graduate" the semester you plan to graduate (through eLion)

_____ Thesis format review with Graduate School Thesis Office

_____ Schedule Thesis Seminar (see Svend Pedersen to reserve room)

_____ Schedule Thesis Defense (inform Svend Pedersen of date, time and location no later than one month prior to defense)

_____ Give thesis to Department Head (allow one week for review & signature). Provide thesis to Svend Pedersen. Due to Department Head's travel obligation, recommend you inquire about schedule prior to submitting thesis.

_____ Schedule Exit Interview with Department Head

_____ Submit one hard bound copy of thesis to Svend Pedersen

_____ Complete Termination/Transfer Checklist (see back of handbook)
Return keys, purchase card, and equipment. Complete ERS reports, vacate office

Notify Svend Pedersen no later than one month prior to your planned departure date

Table 1. MINIMUM REQUIREMENTS for M.S. DEGREE IN FOOD SCIENCE AT PENN STATE
(as approved at the Faculty meeting on 6/7/11, corrected by GPC 10/17/13)

	# Cr
MINIMUM GRADUATE SCHOOL REQUIREMENTS[1]	
Total 400-500-600 level credits needed to graduate	30
Maximum Transfer credits allowed (needs approval)	10
Maximum Non-degree credits allowed (needs approval)	15
Minimum 400-500 level coursework in major	12
Minimum 500-600 level credits required	18
Minimum Thesis research credits	6
Minimum GPA needed to graduate	3.0
Thesis	Yes
Time limit (# years from date of admission)	8
MINIMUM DEPARTMENTAL REQUIREMENTS (which will also fulfill minimum Graduate School Requirements)	
FD SC 500A, FD SC 500B, FD SC 500C, FD SC 500D	4
FD SC 501	2
FD SC 602[2]	1
Other 500-level FD SC courses[3]	6
FD SC 600 credits (minimum needed)	6
Additional 400-500 level courses	6
Statistics (STAT 500 or equivalent)[4]	•
Graduate committee	Yes
Thesis seminar	Yes
Thesis defense	Yes

[1] University Bulletin on Graduate Degree Programs (http://bulletins.psu.edu/bulletins/whitebook)

[2] Beginning with 2nd year, M.S. students are required to assist with one course each academic year as a Teaching Assistant (TA). This 1-credit hour for FD SC 602 does not count toward the Graduate School 18 credit requirement of 500-600 level credits, nor towards the total 30 credits required to graduate.

[3] 3 credits of the requirement can be satisfied by 400 level Food Science courses with permission of the advisor.

[4] Students receiving a M.S. in Food Science must have satisfactorily completed at least one 400-500 level course in each of these areas, during their undergraduate or graduate program. If you have already taken these courses at another institution, please send a memo (countersigned by your advisor) and a copy of the syllabi to the Graduate Program Coordinator.

WORKSHEET DESCRIBING HOW M.S. REQUIREMENTS WERE SATISFIED

This form must be submitted to Svend Pedersen, 207 Food Science Building, before thesis defense date can be scheduled.

Name: _____ Date: _____

GRADUATE SCHOOL REQUIREMENTS **COURSE(S) TAKEN TO MEET REQUIREMENTS**

Total 400-500-600 level credits taken (30)

Transfer credits (maximum 10)
Non-degree credits (maximum 15)

400-500 level coursework in major (minimum 12)
500-600 level credits (minimum 18)
Thesis research credits (minimum 6)

Current GPA (minimum 3.0)
years from date of admission (maximum 8)

DEPARTMENTAL REQUIREMENTS

FD SC 500A (1 cr)
FD SC 500B (1 cr)
FD SC 500C (1 cr)
FD SC 500D (1 cr)
FD SC 501 (2 cr)
FD SC 602 (1 cr)
Other 500-level FD SC courses (6 cr)

FD SC 600 credits (6 cr)

Additional 400-500 level courses (6 cr)
Statistics (STAT 500 or equivalent)

Please also attach the following:

- 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

Ph.D. DEGREE REQUIREMENTS

The graduate school requirements for the Ph.D. degree are described in detail in the Graduate Bulletin. The Food Science Faculty has determined additional general and specific requirements and recommendations. An overview of these requirements is presented in Table 2. 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 student and no assurance of acceptance as a doctoral candidate until the candidacy examination has been passed.

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 Examination: See section *on English Competency Examination*.

Candidacy Examination: See section *on Candidacy Examination Committee and its Activities*.

Graduate Committee: See section on *Doctoral Committee*.

Comprehensive Examination: See section on *Comprehensive Examination.*

Final Oral Examination/Thesis Defense: See section on *Final Oral Examination/Thesis Defense*.

Electronic Submission of Dissertation and Thesis (ETD): Electronic submission of the final dissertation (eTD) became a requirement for all doctoral candidates at Penn State starting in fall semester 2006.. For additional information on the mechanics of eTD preparation, visit the eTD Web site (http://www.etd.psu.edu/).

Residence: There is no required minimum of credits or semesters of study, but over some twelve-month period during the interval between admission to candidacy and completion of the Ph.D. program the candidate must spend at least two consecutive semesters (which may include the semester in which the candidacy examination is taken) as a registered full-time student engaged in academic work at the University Park Campus. Beyond this residency requirement, a student receiving assistantship support must be continuously registered up through the time of the comprehensive examination (e.g. students on half-time assistantships should schedule 9 to 12 credits per semester). If the doctoral candidate is not receiving assistantship support but is using University facilities and/or faculty-time, the student must enroll for a minimum of one credit during that semester or session (enrollment for a minimum of one credit is required during every semester or session until completion of the doctoral defense as long as University facilities and/or faculty time are used). In addition to the above, all students must be registered for a minimum of one credit during the semester or session that the comprehensive examination is held. **Once the comprehensive examination has been successfully passed, the student may enroll for FD SC 601 and will be considered to have "full-time" status (Note, that enrollment for one credit of 600 is also acceptable to the Graduate School after the student successfully passes the comprehensive examination; however, the student will not be considered to have "full-time" status in this case).** After successfully completing the doctoral defense, there is no requirement for the student to be registered, however, all degree requirements (including submission of the final doctoral thesis to the graduate school) must be completed prior to expiration of the statute of limitations (8 years for the doctoral candidate from the date of successful completion of the candidacy examination).

Time Limitations: A student devoting half-time (9 to 12 credits per semester) to graduate studies will normally require about two to three years beyond the Master's degree to earn the Ph.D. degree. In no case may a student take more than eight years to complete the program from the date of acceptance as a Ph.D. candidate.

Department of Food Science
Ph.D. Graduate Program Checklist

Year 1

_____ Attend orientation, Get Keys, Set up Email account

_____ Take AEOCPT Exam for international students only, (during 1st semester)
http://aplng.la.psu.edu/academicPrograms/ita_whatIsAEOCPT.php

_____ Take Chemical Safety Training http://www.ehs.psu.edu

_____ Schedule FD SC 500 A, B, C, D and FD SC 501

_____ Schedule other 400 and 500 level courses in consultation with advisor

_____ Research

_____ Develop a coursework plan in consultation with thesis committee

_____ Schedule Candidacy Exam/English Competency during first semester

_____ Schedule Candidacy Exam/Science Competency

_____ Complete SARI (as part of FD SC 501)

Year 2

_____ Schedule FD SC 602 (along with your TA assignment)/Serve as TA

_____ Schedule other courses per your coursework plan

_____ Research

_____ Appoint Ph.D. thesis committee. See draft form in back of handbook. Do not obtain signatures until form is reviewed and processed by Svend Pedersen

_____ Develop thesis proposal & present to thesis committee

_____ Schedule Comprehensive Exam

Year 3

_____ Schedule FD SC 602 (along with your TA assignment)/Serve as TA

_____ Research

_____ Write thesis & manuscript(s)

_____ Activate "Intent to Graduate" the semester you plan to graduate (through eLion)

_____ Schedule Thesis Seminar (see Svend Pedersen to reserve room)

_____ Schedule Thesis Defense (inform Svend Pedersen of date, time and location one month prior to defense)

_____ Give thesis to Department Head (allow at least one week for review & signature). Please provide thesis to Svend Pedersen. To accommodate Department Head's travel schedule, please confirm with Svend Pedersen prior to submitting thesis

_____ Schedule Exit Interview with Department Head

_____ Submit one hard bound copy of thesis to Svend Pedersen

_____ Complete Termination/Transfer Checklist (see back of handbook)

Return keys, purchase card, and equipment. Complete ERS reports, vacate office

Notify Svend Pedersen no later than one month prior to your planned departure date

Table 2. MINIMUM REQUIREMENTS for Ph.D. DEGREE IN FOOD SCIENCE AT PENN STATE WHEN ENTERING WITH AN M.S. DEGREE OR EQUIVALENT

(as approved at the Faculty meeting on 06/7/2011)

	# Cr
MINIMUM GRADUATE SCHOOL REQUIREMENTS[1]	
Maximum Non-degree credits allowed (needs approval) (Transfer credits are not allowed for the Ph.D. degree)	15
Candidacy exam	Yes
Comprehensive exam	Yes
Thesis	Yes
Residency (# semesters)[2]	2
Minimum GPA needed to graduate	3.0
Time limit (# years from date of passing candidacy exam)	8

The Graduate School has no minimum credit hours requirement for the Ph.D. program. However, the Department of Food Science requires that the following list of courses be completed.

MINIMUM DEPARTMENTAL REQUIREMENTS (which will also fulfill min[m] Graduate School Requirements)	
FD SC 500A, FD SC 500B, FD SC 500C, FD SC 500D[3]	4
FD SC 501[3]	2
FD SC 602[4]	2 semesters of 1 cr. each
Statistics (STAT 500 or equivalent) [5]	•
Additional 500-level courses[6]	6
Candidacy exam	Yes
Doctoral committee	Yes
Comprehensive exam	Yes
Thesis seminar	Yes
Thesis defense	Yes

1 University Bulletin on Graduate Degree Programs (http://bulletins.psu.edu/bulletins/whitebook)

2 Two semesters within a 12-month period; summer session is not considered a semester.

3 Not needed if student received credit for course during masters degree program at Penn State.

4 Beginning with 2nd year, Ph.D. students are required to assist with one course per academic year as a Teaching Assistant (TA).

5 Students receiving a Ph.D. in Food Science must have satisfactorily completed at least one 400-500 level course in each of these areas, during their undergraduate or graduate program.

6 3 credits of the requirement can be satisfied by 400 level Food Science courses with permission of the advisor.

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 Svend Pedersen, 207 Food Science Building, before thesis defense date can be scheduled.

Name: _____ Date: _____

GRADUATE SCHOOL REQUIREMENTS[1]	**COURSE(S) TAKEN TO MEET REQUIREMENTS**
Non-degree credits (maximum 15)	
Candidacy exam	Yes
Comprehensive exam	Yes
Thesis	Yes
Residency (minimum 2 semesters)	
Current GPA (minimum 3.0)	
# years from date of passing candidacy exam (Maximum 8)	

DEPARTMENTAL REQUIREMENTS	
FD SC 500A (1 cr)	
FD SC 500B (1 cr)	
FD SC 500C (1 cr)	
FD SC 500D (1 cr)	
FD SC 501 (2 cr)	
FD SC 602 (2 semesters x 1 cr)	
Statistics (STAT 500 or equivalent)	•
Additional 500-level courses (6 cr)	
Date of Candidacy exam	
Date of Comprehensive exam	

Please also provide the following information:

- 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

ENGLISH COMPETENCY EXAMINATION

All Ph.D. 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. candidates must take this exam, including domestic and international students.

The Graduate Program Coordinator 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 Graduate Program Coordinator will determine the topic and supervise the administration of this writing exercise. The writing will be evaluated by the Graduate Program Coordinator.

2. Complete a half-hour oral interview with the Graduate Program Coordinator to test speaking competency.

The Graduate Program Coordinator 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, recommendation to take an 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 SPCOM 114G, 116G, or other appropriate courses.

Attainment of Competency

For candidates who performed unsatisfactorily during the 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 Candidacy Examination Committee 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.

CANDIDACY EXAMINATION COMMITTEE AND ITS ACTIVITIES

Committee Composition: The Ph.D. Candidacy Examination Committee will be composed of four Food Science faculty members representing the fields of food chemistry, food microbiology, food engineering, and nutrition. 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 Candiacy Examination must be taken within three semesters of entry into the doctoral program http://bulletins.psu.edu/graduate/degreerequirements/). 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 Candidacy Examination. Approximately two months before conducting the Candidacy Examination, the Chair of the Candidacy Examination Committee will ask all Food Science graduate students to inform the Chair of their intent to take the Candidacy Examination. Approximately one month prior to the Candidacy Examination, the Candidacy Examination Committee will meet collectively with those students scheduled to take the Candidacy Examination to clarify the protocol and evaluation criteria.

Students must pass the Candidacy Examination to be considered a Ph.D. candidate. The Candidacy Examination will be administered consistent with the policy of the Graduate School. The general guidelines are described in the Graduate Degree Programs Bulletin (http://bulletins.psu.edu/graduate/degreerequirements/).

All graduate students are required to have a **minimum grade-point average of 3.00** for work done at the University at the time the candidacy examination is given, and may not have deferred or missing grades.

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

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

Before taking the Candidacy 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 Candidacy Examination, the student shall submit to the department's Graduate Programs Staff Assistant the following:

1. A copy of the master's thesis and any relevant published work.
2. Transcripts of undergraduate and graduate course work and GRE scores.
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.

All of the materials will be made available in a file in the main office for review by the Candidacy Examination Committee prior to the Candidacy Examination.

The Candidacy Examination will consist of an oral examination. The Candidacy 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 Candidacy examination, the student will be given a research paper of broad relevance to Food Science. This paper will be selected by the Candidacy 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 criticize.

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 Candidacy Committee members. Students may use visuals 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 Candidacy 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 or not the student may retake the Candidacy Examination. At least 3 out of 4 positive votes are required to allow a retake and, they must take the Candidacy Examination the following January or May. Students will only be given one opportunity to retake the Candidacy Examination. Students will only be given one opportunity to retake the Candidacy Examination.

The result of the Candidacy Examination (pass, fail with the opportunity to retake, or fail with no opportunity to retake) will be communicated to each student immediately after their Candidacy Examination. Within a week after all of the Candidacy Examinations are finished, each student taking the Candidacy Exam, their advisor(s), all members of the Candidacy Examination Committee, the Department Head and the Graduate Program Coordinator will be notified in writing as to the outcome of the Candidacy Examination, whether the Candidacy Examination Committee perceived any specific deficiencies and what coursework and/or other work are recommended to remedy the perceived deficiencies.

DOCTORAL COMMITTEE

After a student has been admitted to candidacy for the Ph.D. degree, the student's advisor in consultation with the candidate will recommend a doctoral supervisory committee to the Department Head. The "Graduate Student Committee Policies and Procedures and Committee Appointment Signature Form" will now be used to appoint and/or revise a doctoral committee (Please see back of handbook). The signature page of the "Graduate School Committee Policies and Procedures and Committee Appointment Signature Form" should be returned to Graduate Enrollment Services soon after the student is admitted to candidacy. If a committee change is necessary, the signature page must be resubmitted but only with the signature(s) of the new committee member (s). A doctoral examination will not be scheduled until the signature page is completed and on file in the Office of Graduate Enrollment Services. The Dean of the Graduate School, upon recommendation of the Department Head, will appoint a doctoral committee consisting of four or more active members of the Graduate Faculty, at least three of whom are members of the Food Science Graduate Faculty. In addition, it is required to have a member from another department of the University on the Committee. If a minor has been selected, a faculty member representing the minor field must be appointed to the Committee. The chairman of the committee generally is a member of the Food Science Graduate Faculty. The committee is responsible for:

1. Approving the broad outline of the student's program of course work and research.

2. Approving the student's communication abilities.
3. Approving the student's plan of research.
4. Administering and evaluating the comprehensive and final examinations, and approving the thesis.

COMPREHENSIVE EXAMINATION

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.
Candidates are required to have a minimum grade-point average of 3.0 for work performed at Penn State and must be registered as a graduate degree student at the time the comprehensive exam is given. 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. The scheduling form is available in 202 Food Science Building, and must be completed at least two weeks prior to the oral examination.
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 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

Prior to the Final Oral Exam, student will present a seminar to the department. See Svend Pedersen to set up time and room for seminar and submit abstract to him via email (sep14@psu.edu) at least two weeks prior to the seminar. The student's committee should be invited to attend.

FINAL ORAL EXAMINATION/THESIS DEFENSE

A copy of your thesis must be given to each member of your committee two weeks prior to the scheduled Final Oral Examination. The thesis must be in the format acceptable for submission to the Graduate School. The majority of the committee members must agree to proceed with the defense, one week prior to the scheduled Final Oral Examination.

The doctoral candidate who has satisfied all other requirements for the degree will be scheduled by the Dean of the Graduate School, on recommendation of the doctoral committee through the Department Head, to take a final examination. The final examination may not be scheduled until at least three months have elapsed after the comprehensive examination was passed, unless permission is granted by the Dean of the Graduate School. The deadline for holding the examination prior to commencement is listed in the Graduate School calendar. The examinations is oral, open to the public, and related in large part to the thesis. The final examination must be scheduled with the Graduate School Office at least two weeks before the examination is to be held.

The final thesis with all of the signatures of the committee members should be submitted to the head of the department, for signature, at least one week prior to submission to the Graduate School

The following page contains a worksheet that can 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 Office of Student Programs, 202 Food Science Building, before the final oral examination can be scheduled. It is the responsibility of the student to insure that all appropriate requirements for a degree have been met.

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 and Admissions committee 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 Graduate Program and Admissions Committee.

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 Candidacy 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 Candidacy 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:

- 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 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 students advisor
  The student's advisor must provide a letter to the Graduate Program and Admissions 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 Graduate Program and Admission Committee 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

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 Candidacy Examination has been passed". Therefore, it is strongly advised that applicants be informed of the procedural requirements and evaluation criteria necessary for passing the Candidacy Examination. These include taking the exam within 3 semesters 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.

Table 3. MINIMUM REQUIREMENTS for PH.D. DEGREE IN FOOD SCIENCE AT PENN STATE WITHOUT FIRST RECEIVING AN M.S. DEGREE

(as approved at the Faculty meeting on 06/7/2011, corrected by GPC 10/17/13)

	# Cr
MINIMUM GRADUATE SCHOOL REQUIREMENTS[1]	
Maximum Non-degree credits allowed (needs approval)	15
(Transfer credits are not allowed for the Ph.D. degree)	
Candidacy exam	Yes
Comprehensive exam	Yes
Thesis	Yes
Residency (# semesters)[2]	2
Minimum GPA needed to graduate	3.0
Time limit (# years from date of passing candidacy exam)	8

The Graduate School has no minimum credit hours requirement for the Ph.D. program. However, the Department of Food Science requires that the following list of courses be completed.

MINIMUM DEPARTMENTAL REQUIREMENTS(which will also fulfill minimum Graduate School requirements)

FD SC 500A, FD SC 500B, FD SC 500C, FD SC 500D	4
FD SC 501	2
FD SC 602[3]	2
Other 500-level FD SC courses[4]	6
FD SC 600 credits (minimum needed)	6
Additional 400-500 level courses	6
Statistics (STAT 500 or equivalent) [5]	•
Candidacy exam	Yes
Doctoral committee	Yes
Comprehensive exam	Yes
Thesis seminar	Yes
Thesis defense	Yes

[1] University Bulletin on Graduate Degree Programs (http://bulletins.psu.edu/bulletins/whitebook)

[2] Two semesters within a 12-month period; summer session is not considered a semester.

[3] Beginning with 2nd year, Ph.D. students are required to assist with one course each academic year as a Teaching Assistant (TA).

[4] 3 credits of this requirement can be satisfied by 400 level Food Science courses with permission of the advisor.

[5] Students receiving a Ph.D. in Food Science must have satisfactorily completed one 400-500 level course in each of these areas, during their undergraduate or graduate program.

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

This form must be submitted to Svend Pedersen, 207 Food Science Building, before thesis defense date can be scheduled.

Name: _____ Date: _____

GRADUATE SCHOOL REQUIREMENTS	**COURSE(S) TAKEN TO MEET REQUIREMENTS**
Non-degree credits (maximum 15)	
Candidacy exam	Yes
Comprehensive exam	Yes
Thesis	Yes
Residency (minimum 2 semesters)	
Current GPA (minimum 3.0)	
# years from date of passing candidacy exam (Maximum 8)	

DEPARTMENTAL REQUIREMENTS

FD SC 500A (1 cr)	
FD SC 500B (1 cr)	
FD SC 500C (1 cr)	
FD SC 500D (1 cr)	
FD SC 501 (2 cr)	
FD SC 602 (2 semesters x 1 cr)	
FD SC 600 (6 cr)	
Other 500-level FD SC courses (6 cr)	
Additional 400-500 level courses (6 cr)	
Statistics (STAT 500 or equivalent)	•
Date of Candidacy exam	
Date of Comprehensive exam	

Please also provide the following information:

- 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

FOOD SCIENCE GRADUATE COURSES OFFERED

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 (2) 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

406. 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

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 (2) Significance of microorganisms in food commodities, microbial spoilage, food-borne infections, and intoxications; methods of preservation, processing, and control. Prerequisite: MICRB 201, 202.
Doores/Dudley

409W. FOOD MICROBIOLOGY LABORATORY (3) 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. Doores

410. CHEMICAL METHODS OF FOOD ANALYSIS (3) Qualitative and quantitative determination of food constituents. Prerequisite: BMB 212, FD SC 400. Vanamala

411. MANAGING FOOD QUALITY (2) Principles and applications of Hazard Analysis Critical Control Points. Statistical tools for the control and improvement of food quality. Prerequisite: FDSC 408, 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

430. UNIT OPERATIONS IN FOOD PROCESSING (3) Thermal processing, refrigeration, freezing, dehydration, and concentration in the food industry, including effects on food quality, food packaging and waste management. Prerequisite: FD SC 400, 405, 408. Anantheswaran

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.

497E. ADVANCED WINE PRODUCTION AND ANALYSIS (3). Laboratory-based course in the processing and analysis of musts and wines. Emphasizes hands-on application and advanced problem solving in enology.
Elias

497F. FOOD SYSTEMS IN ITALY (2). Food Science Study tour in Northern Italy. Course will compare food and agricultural systems between the US and Italy.
Elias

497Z. PRODUCT AND PROCESS DESIGN (2). Ziegler

500A FUNDAMENTALS OF FOOD SCIENCE – MICROBIOLOGY. (1) Intensive overview of the field of Food Science with the focus on microbiology. Knabel

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. Coupland

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. Ziegler

506 FLAVOR CHEMISTRY. (3) Formation, analysis and release of flavors in food systems. Prerequisite(s): FD SC 400.

507 ADVANCED FOOD MICROBIOLOGY. (3) Roles of microorganisms in food preservation, spoilage, health and disease. Recent advances in detection, tracking and control of foodborne pathogens. Prerequisite: FD SC 408 or FD SC 500 , and a 400-level course either biochemistry or molecular biology. Knabel

514 FOOD PHYSICAL CHEMISTRY. (3) Physical principles underlying food structure and quality. Prerequisite: FD SC 400 or FD SC 500C Coupland

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 Cutter

534 (NUTRN 597G) 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

596 INDIVIDUAL 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 FD SC 596 and should submit also CONTRACT FOR FOOD SCIENCE SPECIAL PROBLEMS COURSES (FD SC 596).

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.

597F Microbial Metabolism in Foodborne Organisms (3) Dudley

597K (NUTR 597K /BB H 597K) Food Addiction: Fact or Fiction? (3) Original literature using both human subjects and animal models relevant to the topic of food addiction will be discussed. Hayes

597X (1) Functional Foods and Dietary Supplements (concurrent with FD SC 497A) Lambert

597X (1) Advanced Sensory Science (concurrent with FD SC 404 (3) Hayes

597E (1) Advanced Topics in Food Toxins, Mutagens, and Carcinogens (concurrent with FD SC 407) (1) – Chemical and biochemical aspects of toxic, mutagenic and carcinogenic compounds in foods. Course covers primary literature on the sources, chemistry and human health complications of these compounds Lambert

597X (1-3) Advanced topics in Food Engineering Ziegler

597Z (1) Product and Process Design (concurrent with FD SC 497Z (2) Ziegler

600 THESIS RESEARCH. (on campus). FD SC 600 cannot be taken for a letter grade.

A master's candidate is not required to register for the final semester in order to graduate or in order 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

602 SUPERVISED EXPERIENCE IN COLLEGE TEACHING Milillo

610 THESIS RESEARCH. (off campus)

611 Ph.D. DISSERTATION. (part time)

601. Ph.D. DISSERTATION.

Registration requirements for FD SC 601

International Students

1. Ph.D. students who have passed their candidacy exam must continually be 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 FD SC 601.
3. After the defense, in order to remain in the U.S. on a legal status, the student should apply for OPT/CPT. Students are urged to contact ISS 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 candidacy exam must continually be registered until the semester that they defend their thesis.
2. Students who have passed their Comprehensive Exam should register for FD SC 601.
3. Students should be formally registered during the semester (including summer) they intend to defend their thesis.

602 SUPERVISED EXPERIENCE IN COLLEGE TEACHING

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 serving as a TA in food science. Registration will generally be 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 Graduate Program Coordinator 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 FD SC 602 implies additional educational activity by the student. Duties carried out in the normal course of TA assignments are not sufficient to fulfill FD SC 602 requirements.

Grade - The grade for this course will be assigned jointly by the instructor for FD Sc 602 and the instructor for the course for which the student is the TA.

AEOCPT (American English Oral Communicative Proficiency Test)

All International students who plan to be a teaching assistant must take the AEOCPT exam that is offered through the Department of Applied Linguistics.. You should preregister via this website
http://aplng.la.psu.edu/academicPrograms/aeocpt_register.shtml

The score you receive on this test will determine when you may assume teaching duties as a teaching assistant. Also effective January 1995, an American English Oral Communicative Proficiency Test Score is required for enrollment in ESL 115G, ESL 117G, and ESL 118G. Students who have not taken the oral proficiency test will not be permitted to enroll in these courses.

The American Oral English Communicative Proficiency Test consists of four sections of questions and activities. Your responses to these are evaluated on the way you express your ideas, not the actual ideas.

In the first section, you are asked to explain a common term from your field. You should explain the term, using examples or analogies if appropriate, and its importance. The second section consists of a role play. You will interact with one of the evaluators about a topic that you should be able to discuss easily. In the third section, you are asked to respond to three questions of general interest. One of the evaluators will ask you the questions. They will not be in written form. In the fourth section, you are given information, which you are then asked to "present" to a group of students. You are able to refer to the information printed in the test booklet. You are given time to prepare you answers and should answer as completely as possible.

You will be evaluated on three important aspects of your English language proficiency. These include: pronunciation (the articulation of specific sounds, and the stress and intonation of your speech); fluency (the rate and appropriateness of pauses in your speech); and comprehensibility (how extensive and appropriate is your use of vocabulary and grammar).

You will be tested by two evaluators (trained graduate students in the Department of Applied Linguistics). One of the will give you instructions, but both will be evaluating your English language proficiency. The test will be tape recorded. If there is a test discrepancy, a third rater will listen to the tape to score your test. Tapes are destroyed after six months.

Before the evaluators begin the test, one of them will explain procedures to you and ask you informal questions about yourself. This "warm-up" conversation is meant to help you relax. It is not graded, even if it is recorded.

One of the evaluators will give you a booklet so you can follow the instructions in writing as the evaluator reads them to you. You are allowed to ask questions about the instructors or the content of the test throughout. You will NOT be penalized for asking questions.

The test takes approximately 25 minutes to complete. Within one week of taking the test, you should check with Juanita Wolfe to receive your score. Scores range from 0-300. Effective August 1999, a score of 250 or higher allows an international student to assume teaching responsibilities with no restrictions. Scores under 250 require additional coursework in English. The following scores and interpretations constitute the guidelines followed by the Department of Applied Linguistics.

AEOCPT SCORE	REQUIRED COURSE	PROGNOSIS
250-300	None	Student may assume teaching duties with no restrictions.
230-249	Enroll in **ESL 118G** before assuming teaching duties.	After one semester, student should be able to assume teaching duties with no restrictions. Students enrolled in ESL 118G must receive a grade of "B" before they assume teaching duties with no restrictions.
200-229	Enroll in ESL 117G	Will require at least two semesters before student is recommended to teach. Students enrolled in ESL 117G must receive a grade of "B" before they will be allowed to enroll in ESL 118G.
below 200	Enroll in ESL 115G	Will require at least three semesters before student is recommended to teach. Students enrolled in ESL 115G must receive a grade of "B" before they will be allowed to enroll in ESL 117G.

500 LEVEL FOOD SCIENCE COURSES

Even Years (2014, 2016, 2018)

Fall Semester

- FD SC 500A(1) Fundamentals of FD SC-Micro (Knabel)
- FD SC 500B(1) Fundamentals of FD SC-Eng (Anantheswaran)
- FD SC 521(3) - Food Defense (Cutter, on-line)
- FD SC 597E(1) - Advanced Topics in Food Toxins, Mutagens, and Carcinogens(Lambert) (concurrent with FD SC 407, Food Toxins, 2 Cr.)
- FD SC 597G(1) - Ingestive Behavior (Hayes)
- FD SC 597Z(1) – Product & Process Design (Ziegler) (concurrent with FD SC 497Z, 2 cr.)

Spring Semester

- FD SC 500C(1) Fundamentals of FD SC-Chem(Coupland)
- FD SC 500D(1) Fundamentals of FD SC-Nutr (Keller)
- FD SC 501(2) Research Methods in FD SC (Lambert)
- FD SC 507(3) - Advanced Food Microbiology (Knabel)
- FD SC 597K(3) – Food Addiction (Hayes)
- FD SC 597G(1) – Ingestive Behavior (Hayes)
- FD SC 597(1) – Advanced Sensory Science (Hayes) (concurrent with 404, 3 cr.)

Odd Years (2013, 2015, 2017)

Fall Semester

- FD SC 500A(1) Fundamentals of FD SC-Micro(Knabel)
- FD SC 500B(1) Fundamentals of FD SC-Eng(Anantheswaran)
- FD SC 514(3) - Food Physical Chemistry (Coupland)
- FD SC 521(3) - Food Defense (Cutter on-line)
- FD SC 597F(3) – Microbial Metabolism in Foodborne Organisms (Dudley)
- FD SC 597G(1) - Ingestive Behavior (Hayes)
- FD SC 597E(1) - Advanced Topics in Food Toxins, Mutagens, and Carcinogens(Lambert) (concurrent with FD SC 407, Food Toxins, 2 Cr.)
- FD SC 597Z(1) – Product & Process Design (Ziegler) (concurrent with FD SC 497Z, 2 cr.) Beginning 2012.

Spring Semester

- FD SC 500C(1) Fundamentals of FD SC-Chem(Coupland
- FD SC 500D(1) Fundamentals of FD SC-Nutr(Keller)
- FD SC 501(2) Research Methods in FD SC(Lambert)
- FD SC 597(1) – Advanced Sensory Science (Hayes) (concurrent with 404, 3 cr.)
- FD SC 534G(1) – Ingestive Behavior (Hayes)
- FD SC 597X(1-3) – Advanced topics in Food Engineering

CONTRACT FOR FOOD SCIENCE SPECIAL PROBLEMS COURSES (FD SC 596)

Please complete this form and submit to Svend Pedersen, 207 Food Science Building, to complete registration.

Student's Name _____
(print)

Professor's Name _____
(print)

Semester and Year _____

Course Number and Name _____

Number of Credits _____

_____ _____
Student's Signature Date

_____ _____
Professor's Signature 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 465	Food/Biological Processing Engineering
ABE 513	Applied Finite Element, Finite Difference and Boundary Element Methods
ABE 559	Agricultural and Biological Systems Simulation
ABE 562	Boundary Element Analysis
CH E 446	Introduction to Transport Phenomena
CH E 453	Advanced Chemical Engineering Thermodynamics
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 514	Molecular Biology and Cellular Regulations
BMMB 520	Carbohydrates, Lipids and their Integrated Metabolism
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 512	Nutrition and Aging
NUTRN 513	Atherosclerosis and Nutrition
NUTRN 514	Prostaglandins and Leukotrienes
NUTRN 515	Mathematical Modeling in Nutrition
NUTRN 581	Regulation of Nutrient Metabolism I
NUTRN 582	Regulation of Nutrient Metabolism II

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
PPATH 540	Plant Disease Control
MAT SE 501	THERMODYNAMICS OF MATERIALS
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

MASTERS COMMITTEE APPOINTMENT AND SIGNATURE FORM

Student Name: _____

Advisor: _____

Committee Chair

_____ _____ _____
Name Signature Date

Committee Members

_____ _____ _____
Name Signature Date

_____ _____ _____
Name Signature Date

_____ _____ _____ (Optional)
Name Signature Date

Please return to Svend Pedersen

Doctoral Committee Appointment Form Worksheet

Student Name: _____

Advisor: _____

Committee Chair/Co-Chair*

_____
Name

_____
Name

Dissertation Advisor/Co-Advisor*

_____
Name

_____
Name

Major Program Members*

_____
Name

_____
Name

Outside Field Member(s)*

_____ _____
Name Program

_____ _____
Name Program

Minor Field Member(s)

_____ _____
Name Program

_____ _____
Name Program

Special Field Member(s)

_____ _____
Name Program

_____ _____
Name Program

*Required Field
Please return to Svend Pedersen

Examination Request Worksheet

Student Name: _____

Advisor: _____

Date of Examination: Time: Location:

Committee Chair/Co-Chair*

_____
Name

_____
Name

Major Program Members*

_____
Name

_____
Name

Outside Field Member(s)*

_____ _____
Name Program

_____ _____
Name Program

Minor Field Member(s)

_____ _____
Name Program

_____ _____
Name Program

Special Field Member(s)

_____ _____
Name Program

_____ _____
Name Program

*Required Field
Submit no later than 3 weeks prior to desired examination date.
Please return to Svend Pedersen

Resume Study/Change of Graduate Degree or Major
http://www.gradschool.psu.edu/faculty-and-staff/forms/ges/#Student_Forms

Registration Drop/Add Form
http://www.registrar.psu.edu/student_forms/dropadd.pdf

Concurrent Graduate Degrees
http://www.gradschool.psu.edu/forms-and-documents/ges-owned-forms-and-documents/concurrentgraduatedegreeprogramsplanofstudy/

Transfer of Credit forms
http://www.gradschool.psu.edu/forms-and-documents/ges-owned-forms-and-documents/xfercredit2pdf/

FOOD SCIENCE
GRADUATE STUDENT GRADUATION/TRANSFER
CHECK-OUT SHEET

Food Science graduate students should follow the procedure listed below before leaving the University to ensure that they are in good standing at the time of their departure. The procedure consists of obtaining the signature of the following individuals, ascertaining that the student has fulfilled all obligations in the Food Science Department. This form should be returned to Svend Pedersen.

Student's Name _____ **Today's Date** _____

Thesis/Paper Status: Complete/Incomplete (circle one) Submitted/Not Submitted (circle one)

Thesis Title: _____

_____

Schedule of Thesis Defense (schedule with Juanita or Svend) _____

Have you activated your intent to graduate through eLion? Yes or No Graduation Date:_____

The signatures below confirm the student named above has fulfilled all obligations in the following areas:

	Signature	Date
1. **Advisor:** • Oral presentation of thesis • Name removed from computer accounts • All borrowed equipment returned • Arrangements made for completion of thesis, etc.	_____	_____
2. **Graduate Program Coordinator & Dept. Head** • Certification of all degree requirements and transmission of information to the Graduate School	_____	_____
3. **Accounting Assistant, Beth Tepsic** • Returned Purchasing Card • Submitted all paperwork for P-Card, Travel expenses, petty cash, etc. • Cancelled dept. copier access • Cancelled eBuy Access *(UDBA processed)*	_____	_____
4. **Return Keys, Vacate office** • Return **all** keys to Room 116 Ag. Admin. • Receive key deposit refund	_____	_____
5. **Schedule Exit interview with Department Head:** (Schedule with Svend Pedersen at least 7 days in advance)	_____	_____
6. Submit one hard bound copy of thesis to Svend Pedersen	_____	_____

7. Forwarding address:

_____

_____

Employer Name & Address:

_____

_____

Transfer/Separation Checklist

Covered Individual Information	
Name (Last, First, Middle Initial):	PSU Employee ID #:
Job Title & Appointment Type:	Last Day Employed/Engaged or Date of Transfer:
Work Unit & Department:	Name of Supervisor/University Contact:

Part I – University Property				
Item	*Yes*	*No*	*N/A*	*Comments*
Keys/Access Cards obtained/Card Swipe access disabled (building/department/office/filing cabinets/desk/etc				
Second Factor Authentication Token				
ID Card/Security Badge				
Purchasing Card				
Parking Permit				
Cellular Phone/Phone Card				
Books/Supplies/Training Materials				
Laptop/Tablet/Other Computer Equipment (include devices and other media)				
Any property for which the individual is listed as custodia in the				
Other Dept./Area Specific Items (Please specify & attach additional documentation if necessary)				

Part II – System Access				
Item	*Yes*	*No*	*N/A*	*Comments*
Access Account				
IBIS				
ISIS				
Local IT Accounts and Network Access (including shared drives				
Database Access				
Other Dept./Area Specific Items (Please specify & additional documentation if necessary)				

Part III – Miscellaneous				
Item	*Yes*	*No*	*N/A*	*Comments*
Resignation letter obtained				
Time & attendance verified				
EAP information provided				
Employee Benefits Division contact info provided				
Personal files from computer cleared/personal belongings removed				
Work files moved to a shared drive				
Telephone forwarded /coverage obtained/discontinu				
Email autoreply created/email forwarded/listserv ac				
Departmental email alias(es) removed				
Termination/Transfer Form Processed				
Salary, short-term or travel advances collected				
Long-term advances independently verified and tra to				
ERS travel reports finalized				
Other Dept./Area Specific Items (Please specify & additional documentation if necessary)				

Part IV – Preparer's Signature – (Please Print & Sign)

(Print) **(Sign)**
(Date)