

**MICHIGAN STATE UNIVERSITY**  
**SCHOOL OF PACKAGING**  
  
**GRADUATE PROGRAMS**  
**STUDENT HANDBOOK**

**2021-2022**  
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# HANDBOOK FOR GRADUATE STUDENTS

## 1. PROGRAM OVERVIEW

The School of Packaging offers graduate programs leading to the degrees of Master of Science in Packaging and Ph.D. in Packaging. The M.S. program offers both Plan A (with thesis) and Plan B (without thesis) options. The on-campus M.S. program concentrates on the thesis option, though the non-thesis program is available. The on-line M.S. program offers the non-thesis option only. For the Ph.D. and thesis M.S. programs, all or most of the coursework and research will be carried out on-campus.

From the moment of manufacture through final use by a consumer, packaging makes a product convenient to transport, protects the product from physical, chemical, and biological hazards, and conveys instructions that are easy to understand. It is a goal of packaging to use the most effective and economical materials to accomplish these functions.

Packaging materials and systems are constantly changing to meet today's needs. Packaging professionals use modern technology and innovative approaches to develop or modify packaging.

### School of Packaging Mission Statement

The mission of the School of Packaging at Michigan State University is to educate packaging professionals and to create innovative solutions that enhance or maintain product quality, increase efficiency, and reduce waste. In doing so, we contribute to the economic development and quality of life of citizens within the State of Michigan and across the world through highly relevant educational experiences and cutting-edge research.

The graduate student population is characterized by diversity. There is a substantial representation of international students from a variety of countries in Asia, Europe, Africa, and the Americas. Many students, both international and domestic, have completed undergraduate degrees in a discipline other than packaging. Engineering and science-related degrees are most prevalent, but business degrees are not uncommon, and other degrees have included printing technology, product design, and many more. Special courses are provided for graduate students without packaging B.S. degrees to acquire the core undergraduate-level knowledge of packaging.

Graduates of the MSU School of Packaging are sought after by employers in the United States and internationally. Few graduate students leave the program without at least one job offer in hand. Graduates with advanced degrees are more likely to go into education, research, or management positions than those with B.S. degrees, and less likely to go into production positions. A wide variety of types of companies employ graduates with advanced degrees, as well as those with bachelor's degrees.

Facilities and instrumentation are available for advanced study and research in the following areas: product and/or package damage in the physical distribution environment, barrier characteristics of packaging systems and materials, quality preservation and storage stability of packaged products, mechanical properties of packaging materials and systems, distribution packaging, packaging systems development and optimization, medical/pharmaceutical packaging, human factors in packaging, various aspects of packaging in business and marketing, recycling, environmental impacts of packaging, and related areas.

Students engage in a combination of formal coursework as well as independent efforts that result in a thesis or dissertation. At the MS level, a coursework-only plus exam (Plan B) program is available. Programs of study and research are flexible and are designed to meet the needs of individual students.

Emphasis is placed on a broad education in packaging and specialized training in one of the above areas of study.

All on-campus graduate students are expected to attend the School of Packaging orientation program during fall semester. The orientation program includes an overview of the graduate program and of department policies and procedures. The major goal is to familiarize students with the program and provide an opportunity for them to meet their fellow graduate students. The orientation program also focuses on an introduction to the School's faculty and an overview of their research interests and activities, as well as any special research opportunities that currently exist. The major goal is to assist students in choosing a major professor. The time and date of the orientation is announced to students in late summer.

Near the end of each spring semester, typically March 31<sup>st</sup>, all graduate students must submit a report on their progress in the program to their major professor (or to the Graduate Director if they do not yet have a major professor). This form is available on the Packaging website - select Progress Reports for Doctoral Students, Progress Report for Masters Plan A, or Progress Report for Masters Plan B, as appropriate). The next step is a discussion with the major professor (or Graduate Director). Both parties then sign the evaluation form, which is submitted to the Graduate Secretary who will forward to the Graduate Director for approval. Copies are provided to the student and major professor as well as placed in the student file. Students who wish to challenge the accuracy of their academic files may do so by submitting a letter to the Graduate Secretary to be placed in the file.

In order to be certified to graduate, students must apply for graduation. The Graduation Application is now available at <https://reg.msu.edu/StuForms/GradApp/gradapp.aspx> or at [student.msu.edu](https://student.msu.edu). After clicking on the Academic Progress tile, you will see a link to Apply for Graduation in the left-hand navigation under the Graduation heading. If the student does not graduate during the intended semester, a new application must be submitted for the new semester of intended graduation.

All on-campus graduate students are required to attend and participate in the School's seminar program. In addition to the seminar program itself, which has invited speakers presenting on various topics several times each fall and spring semester, this includes oral examination seminars, in which fellow packaging students present results of their thesis or dissertation research, and comprehensive examination seminars, in which packaging Ph.D. students present their dissertation proposals and/or preliminary results. Participation in these seminars and in the teaching program, where appropriate, is designed to broaden the student's background for future career activities.

The final presentation and defense of the dissertation or thesis constitutes the student's final oral examination for Ph.D. and thesis (Plan A) M.S. students. It consists of a public presentation to the students and faculty of the School, along with others who are interested, followed by a closed door oral defense meeting with the guidance committee. Students in the Ph.D. or thesis M.S. programs will also submit a formal dissertation or thesis to the University documenting their work, which will become part of the University library collection. Students are to contact the MSU library for information for all available resources. The final examination for Plan B non-thesis M.S. students is addressed in section 4.3.3.3.

By School policy, the student's guidance committee functions as the examination committee for the final oral examination and for the Ph.D. comprehensive; there is no separate examination committee.

Students in the Ph.D. program must also pass a comprehensive examination. Details about the comprehensive examination are in section 4.2.3.

All students should be familiar with the documents *Graduate Students Rights and Responsibilities* and *Student Rights and Responsibilities at Michigan State University*. These documents address both the rights and the responsibilities of Michigan State University students. They are available at <http://splife.studentlife.msu.edu/>, [Graduate Students Rights and Responsibilities \(GSRR\)](http://splife.studentlife.msu.edu/graduate-students-rights-and-responsibilities-gsrr) and <http://splife.studentlife.msu.edu/student-rights-and-responsibilities-at-michigan-state-university>. The Graduate Student Rights and Responsibilities document was revised in 2014.

Graduate students can join the Packaging Graduate Association, PGA. PGA elects' members to serve on the School's governance committees: Curriculum Committee, Graduate Committee, and Advisory Committee. Student membership on these committees is designed to facilitate student input into School programs and policies.

Various University policies included in the following documents override any inconsistent provisions that might be stated in this handbook:

Academic Programs: [Academic Programs Catalog](#)

MSU/GEU Contract: [MSU-GEU Contract](#)

Guidelines for Graduate Student Advising and Mentoring Relationships: [MSU Guidelines for Graduate Student Mentoring and Advising](#)

Guidelines for Integrity in Research and Creative Activities: [Guidelines for Integrity in Research and Creative Activities](#)

Policy on Relationship Violence and Sexual Misconduct: [Policy on Relationship Violence and Sexual Misconduct](#)

Anti-Discrimination Policy (ADP): [Anti-Discrimination Policy \(ADP\)](#)

Graduate assistants (RAs, TAs, and TEs) are both students and employees. They are thus eligible for disability accommodations in both of these roles, and these accommodations are provided through distinct documents coordinated by RCPD: Students receive VISAs (Verified Individualized Services and Accommodations) or VISTAs (Verified Individualized Services and Temporary Accommodations) and employees receive SEADs (Statements of Employee Accommodation Determination). Graduate assistants can register for both situations using [RCPD's MyProfile portal](#).

Other:

[Code of Teaching Responsibility](#)

[Disability and Reasonable Accommodation Policy](#)

[General Student Regulations](#)

[Integrity of Scholarship & Grades](#)

[Law Student Rights and Responsibilities \(LSRR\)](#)

[Medical Student Rights and Responsibilities \(MSRR\)](#)



## **2. PROGRAM COMPONENTS AND PLAN OPTIONS**

### **2.1 Ph.D.**

The official program of study leading to a Ph.D. consists of completing required course work and credits, passing of a comprehensive examination, completion of a research program and a satisfactory written dissertation based on the research, and successful defense of the dissertation, which includes a public seminar and a final oral examination. These elements of the program are described below, along with other requirements that must be met to successfully complete the program of study.

Study in the Ph.D. program generally focuses on material science applications in packaging, food packaging, medical packaging, mass transport applications, the dynamics and physical distribution aspects of packaging, human factors in packaging, and sustainability of packaging systems.

Completion of the Ph.D. degree normally requires about three years of full-time study after the M.S. degree, culminating in completion and defense of a Ph.D. dissertation. Course requirements (see Section 4.2.5 for minimum requirements) are flexible. The student's guidance committee will set specific course requirements for each individual student based on the student's background, interests, and career goals. These course requirements must be completed and approved by the guidance committee electronically through GradPlan, and must be submitted by the end of the student's first year in the program. It outlines the general dissertation topic and specifies course requirements.

The student must pass a comprehensive examination to demonstrate depth of knowledge in the research area, and a sound research plan that is reasonable in scope. The examination must be taken by the beginning of the student's third year in the program. The comprehensive examination is described further in Section 4.2.4.

The Ph.D. dissertation is intended to make a significant contribution to packaging-related knowledge, and to demonstrate the student's ability to plan, carry out, and report on a significant body of independent research. Ph.D. students are expected to have at least 1 article submitted to a refereed journal prior to scheduling their dissertation defense.

Students must attend research and project presentations given by their fellow students, as well as the School's regular seminar program.

### **BS to Ph.D.**

Admission is offered to students who hold (1) a master's degree in packaging or in a related science or engineering area, for which a thesis was required, or (2) a bachelor's degree in packaging or in a related science or engineering area with significant intensive research experience such as having a peer-review publications as main author, and/or demonstrating the outcome of any research work carried and completed by the candidate.

### **2.2 M.S.**

The official program of study leading to an M.S. consists of completing required course work and credits. Additionally, an M.S. with thesis requires completion of a research program and a satisfactory written thesis based on the research, and successful defense of the thesis, which includes a public seminar and a final oral examination. A non-thesis M.S. requires completion of coursework and a Capstone paper.

These elements of the program are described below, along with other requirements that must be met to successfully complete the program of study.

Areas of study in the M.S. program include those listed in Section 2.1 for the Ph.D. program, as well as packaging systems development and optimization, marketing, and business aspects of packaging, and other areas.

Completion of the M.S. degree normally requires about 2 years of full-time study, longer if collateral courses must be taken (see Section 3.2.2, M.S. Admission Criteria). All students must complete a minimum of 30 credits, not including collateral courses. Both Plan A (thesis) and Plan B (non-thesis) programs are available. The on-campus program offers both Plan A and Plan B, while the on-line program offers Plan B only.

Students selecting Plan A will complete 6 to 8 credits of PKG 899, thesis research, and must submit and defend a master's thesis, in addition to coursework.

Students selecting Plan B will complete additional required courses and are required to pass a final Capstone paper .

Specific requirements for the individual student will be set by the student's guidance committee, based on the student's background, goals, and interests. **The completed GradPlan must be submitted and approved by the guidance committee by the time the student completes 13 program credits or before completing the second semester.** It outlines the general thesis topic, when applicable, and specifies course requirements.

General course requirements are listed in Section 4.3. Students must attend research presentations given by their fellow students, as well as the School's regular seminar program.

### **2.3 M.S. On-line**

The School also offers an on-line Plan B M.S. program. On-line students usually study on a part-time basis, and a somewhat more limited selection of classes is available, but it is possible to complete the degree without coming to the campus.

The on-line M.S. program is intended primarily for professionals working in the field of packaging. General areas of study are identical to the on-campus program.

Program requirements for the on-line M.S. program are identical to those for the on-campus non-thesis M.S. program, with the exception that on-line students are excused from attendance at seminars.

Specific requirements for the individual student will be set by the student's guidance committee, based on the student's background, goals, and interests. The completed GradPlan must be submitted and approved by the guidance committee by the time the student completes 13 program credits and must specify course requirements.

### **2.4 Specializations**

Michigan State University offers the opportunity for students to formally specialize in a multidisciplinary area, primarily through completion of a set of courses, in addition to meeting the requirements for the degree in the student's major. Completion of a specialization is noted on the student's transcript. One

specialization that is of particular interest to Packaging students is that in Food Safety. Specializations are discussed further in Section 4.4.

### 3. APPLICATION INFORMATION AND ADMISSION CRITERIA

#### 3.1 Ph.D.

##### 3.1.1 Ph.D. Application Procedure (Program Code 0486)

The applicant for admission at the graduate level must:

1. Complete the Online Application for Admission to Graduate Study, submit it with a credit card number or by electronic check or money order to cover the application fee. The application can be found at <https://explore.msu.edu/apply>. The deadline is October 15<sup>th</sup> for the following fall semester. A graduate student previously enrolled at MSU who wishes to pursue a degree or program other than the one originally sought, and who has not been enrolled for three consecutive semesters, including the summer Sessions, or who has completed prior courses of study, must file a new graduate application. Current graduate students at MSU are advised to contact the Graduate Director, School of Packaging, for discussion of the optimal procedure for their specific situations.

Note: Graduate students whose enrollment at MSU is interrupted for any reason so that they have not been enrolled for three consecutive semesters, including the summer Sessions, must apply for readmission via the link above.

2. A PhD applicant must find a faculty member willing to serve as their major advisor before admission can be offered. Faculty information can be found at <https://www.canr.msu.edu/packaging/our-team/>
3. Complete the School of Packaging Supplemental Application for PhD in Packaging and return it to the Graduate Secretary, School of Packaging.
4. Request the registrar of **each** college or university attended to send an official copy of any previous schooling (mark sheets, transcripts, diplomas, certificates, etc.) directly to the Graduate Secretary, School of Packaging, in a sealed envelope that shows the school seal or stamp. Official translations must be provided when originals are not in English. These will be recorded and forwarded to the Admissions Office. A transcript of work taken at Michigan State University need not be requested. These documents must arrive in an envelope sealed by the university. Documents issued to students and opened are not acceptable. If the transcript does not indicate that the degree has been awarded, a copy of the diploma is also required.

Note: If the college or university is using an electronic transcript service such as AVOW or eScrip-Safe, the transcripts must instead be sent directly to the MSU Office of Admissions. Please note that electronic transcripts are not accepted from international colleges or universities.

5. Three (3) letters of recommendation
6. Take the Graduate Record Examination (GRE) and have official results sent to the University. MSU code is 1465 and there is no subject code for Packaging; use the code for “other.”

**International students** must also submit:

Note: The MSU Office of Admissions has June 1<sup>st</sup> deadline for international admissions. If we are unable to forward our recommendation of admission to the MSU Office of Admissions for lack of requirements, or if Admissions disapproves the application for any reason, the offer of admission is automatically rescinded. If this happens, you may be able to defer to a future semester, but this is not always possible depending on the circumstances. For Summer and Spring admission, the admit deadline is 3 months before the start of the semester.

It is vital that international students apply and submit all requirements at least by the October 15<sup>th</sup> deadlines. Applications submitted after these deadlines may not be reviewed. y both the School of Packaging and the MSU Office of admissions.

7. International students whose native language is not English are also required to demonstrate proficiency in English before admission (see International Students, Section 3.5, for details). [English-Language Scores \(IELTS, TOEFL, etc.\). For automatic waiver information, contact Susan Barnaby, Graduate Secretary, at \[barnaby@msu.edu\]\(mailto:barnaby@msu.edu\).](#)
8. The student must provide evidence of financial ability to pursue a graduate program at MSU **before the certificate of acceptance to the University will be mailed.** Details of the procedures and amount required, as well as the Affidavit of Support for Graduate International Students, can be found at The Graduate School website at <https://grad.msu.edu/internationalapplicants>.

To ensure full consideration, all documentation should be received by the School by **October 15** for the following fall semester. Applications arriving after this deadline will be considered if space and resources are available. Admission will generally be made only for fall semester unless under unusual circumstances. Admission decisions will be made as soon as possible after the October 15 date. Students who do not enroll as scheduled will not be guaranteed admission at a later date.

Students in need of financial assistance should go to the Office of Financial Aid for information, <http://www.finaid.msu.edu/grad.asp>. Note that international students are not eligible for funding through this office unless offered funding by their major professor

Applicants can check on the status (completeness) of their applications by contacting the Graduate Secretary, Susan Barnaby, School of Packaging, Michigan State University, East Lansing, MI 48824-1223, telephone (517) 884-9566, e-mail [barnaby@msu.edu](mailto:barnaby@msu.edu), or the Graduate Director, Dr. Maria Rubino, Professor, School of Packaging, Michigan State University, East Lansing, MI 48824-1223, telephone (517) 355-0172, fax (517) 355-8999, e-mail [mariar@msu.edu](mailto:mariar@msu.edu).

### 3.1.2 Ph.D. Admission Criteria

Acceptance of an applicant is determined by the University Admissions Office, on recommendation of the School of Packaging, with the approval of the Dean of the College of Agriculture and Natural Resources, after consideration of the applicant's academic record, Graduate Record Examination scores, experience, personal qualifications, and objectives. Applicants who are admitted are classified as **regular**, for students who are fully qualified to undertake the degree program; or **provisional**, for students who have some remediable inadequacy of qualifications.

Admission to the Ph.D. program is highly selective.

Admission is offered to students who hold (1) a master's degree in packaging or in a related science or engineering area, for which a thesis was required, or (2) a bachelor's degree in packaging or in a related science or engineering area with significant intensive research experience such as having a peer-review publications as main author, and/or demonstrating the outcome of any research work carried and completed by the candidate.

A grade-point average of at least 3.40 (4-point scale) is required. (Admission may be granted to an applicant who does not meet the above requirements but shows outstanding potential.)

Admission is contingent on acceptance of the applicant by a faculty member willing to serve as the applicant's major professor. The major professor will do an assessment of the applicants' credentials, research experience, publications from their previous degrees, work experience, and any other credential that the major professors chooses. Applicants are encouraged to correspond with faculty working in their areas of interest who they would like to have as their major professor, to let faculty know of their interest and qualifications. The Graduate Director can assist applicants in identifying appropriate faculty members.

Acceptance by a major professor **does not** guarantee admission. A limited number of students are admitted each year. Thus, unfortunately, the School may be unable to offer admission to several highly qualified students.

### 3.2 M.S.

#### 3.2.1 Application Procedure for Plan A and Plan B Master's

1. Complete the Michigan State University Application for Graduate Study at <https://explore.msu.edu/apply/> . The deadline is January 15<sup>th</sup> for the following Fall semester. Be sure to include the Personal and Academic Statements. A graduate student previously enrolled at MSU who wishes to pursue a degree or program other than the one originally sought, and who has not been enrolled for three consecutive semesters, including the summer Sessions, or who has completed prior courses of study, must file a new graduate application. Current graduate students at MSU are advised to contact the Graduate Director, School of Packaging, for discussion of the optimal procedure for their specific situations.

Note: Graduate students whose enrollment at MSU is interrupted for any reason so that they have not been enrolled for three consecutive semesters, including the summer Sessions, must apply for readmission via the Web at the link above.

2. Request the registrar of **each** college or university attended to send an official copy of any previous schooling (mark sheets, transcripts, diplomas, certificates, etc.) directly to the Graduate

Secretary, School of Packaging, in a sealed envelope that shows the school seal or stamp. Official translations must be furnished when originals are not in English. These will be recorded and forwarded to the Admissions Office. A transcript of work taken at Michigan State University need not be requested. These documents must arrive in an envelope sealed by the university. Documents issued to students and opened are not acceptable. If the transcript does not indicate that the degree has been awarded, a copy of the diploma is also required.

Note: If the college or university is using an electronic transcript service such as AVOW or eScrip-Safe, the transcripts must instead be sent directly to the MSU Office of Admissions. Please note that electronic transcripts are not accepted from international colleges or universities.

3. Three (3) letters of recommendation.
4. Take the Graduate Record Examination (GRE) and have official results sent to the University. MSU code is 1465 and there is no subject code for Packaging; use the code for “other.”

**International students** must also submit:

Note: The MSU Office of Admissions has June 1<sup>st</sup> deadline for international admissions. If we are unable to forward our recommendation of admission, or if Admissions disapproves the application for any reason, the offer of admission is automatically rescinded. If this happens, you may be able to defer to a future semester, but this is not always possible depending on the circumstances. For Summer and Spring admission, the admit deadline is 3 months before the start of the semester.

It is vital that international students apply and submit all requirements at least by the January 15<sup>th</sup> deadlines. Any applications submitted after these deadlines may not be reviewed by both the School of Packaging and the MSU Office of admissions.

5. International students whose native language is not English are also required to demonstrate proficiency in English before admission (see International Students, Section 3.5, for details). [English-Language Scores \(IELTS, TOEFL, etc.\)](#)
6. Financial Proof is required; the Affidavit of Support can be found at <https://grad.msu.edu/internationalapplicants>.
  - a. Financial proof is not required for MS On-line applicants.

### **3.2.1.1 On-Campus MS Program for Plan A or Plan B (Program Code 0409)**

To ensure full consideration, the application for admission and all requirements listed above should be received by the School by **January 15** for the following fall semester. International students are encouraged to apply by or before this deadline. The materials need not be submitted all at the same time; the application form may be submitted prior to other materials becoming available. Applications arriving after this deadline will be considered if space and resources are available. Admission will generally be made only for fall semester, although spring admission is possible in unusual circumstances. For students who have a non-Packaging background and need collateral courses, Fall is especially preferred. Admission decisions for completed application will be made as soon as possible or by mid-March. Admitted students who do not enroll as scheduled will not be guaranteed admission at a later date.

Students in need of financial assistance should go to the Office of Financial Aid for information, <http://www.finaid.msu.edu/grad.asp>. Note that international students are not eligible for funding through this office.

Applicants can check on the status (completeness) of their applications by contacting the Graduate Secretary, Susan Barnaby, School of Packaging, Michigan State University, East Lansing, MI 48824-1223, telephone (517) 884-9566, e-mail [barnaby@msu.edu](mailto:barnaby@msu.edu), or the Graduate Director, Dr. Maria Rubino, Professor, School of Packaging, Michigan State University, East Lansing, MI 48824-1223, telephone (517) 35355-0172, fax (517) 355-8999, e-mail: [mariar@msu.edu](mailto:mariar@msu.edu).

### **3.2.1.2 On-Line MS Program for Plan B (Program Code 0527)**

To ensure full consideration, the application for admission and **all** requirements must be received by the School at least two (2) months prior (for U.S. citizens) or three (3) months prior for international students to the anticipated first semester of enrollment. The materials need not be submitted all at the same time; the application form may be submitted prior to other materials becoming available. While applicants may be admitted for any semester (fall, spring, summer), fall admission is preferred, especially for students who do not have a Packaging background and will need collateral courses.

Financial aid from the University is generally not available for students in the on-line MS program.

Applications will be valid for one year (measured from the first semester of chosen enrollment). Once granted, admission usually is good for one year. Admitted graduate students who wish to change their first semester of enrollment should contact the School of Packaging Graduate Secretary to initiate the process for a change in admit date.

Applicants can check on the status (completeness) of their applications by contacting the Graduate Secretary, Susan Barnaby, School of Packaging, Michigan State University, East Lansing, MI 48824-1223, telephone (517) 884-9566, e-mail [barnaby@msu.edu](mailto:barnaby@msu.edu), or the Graduate Director, Dr. Maria Rubino, Professor, School of Packaging, Michigan State University, East Lansing, MI 48824-1223, telephone (517) 355-0172, fax (517) 355-8999, e-mail: [mariar@msu.edu](mailto:mariar@msu.edu).

## **STUDENT RESIDENCY**

*Michigan State University **will not be offering certain online programs** to students based on their residence at the time of application for admission to Michigan State University - see State-By-State Summary <https://esp.msu.edu/StateSummary.pdf>*

### **3.2.2 Admission Criteria for Plan A and Plan B Master's**

Acceptance of an applicant is determined by the University Admissions Office, on recommendation of the School of Packaging, with the approval of the Dean of the College of Agriculture and Natural Resources, after consideration of the applicant's academic record, Graduate Record Examination scores, experience, personal qualifications, and objectives. Applicants who are admitted are classified as **regular**, for students who are fully qualified to undertake the master's degree program; or **provisional**, for students who have some remediable inadequacy of qualifications.

Basic admission criteria are the same for the on-campus and on-line M.S. programs. However, enrollment in the on-campus program is limited, and not all qualified students can be accepted. Students must

indicate on the application form whether they wish to enroll in the on-campus program (program code 0409) or the on-line program (program code 0527).

A Bachelor of Science degree in packaging or a related undergraduate field (e.g., food science, engineering, business, physics, chemistry, agriculture, etc.) is required for admission to the Master of Science program. Students lacking the equivalent of a bachelor's degree in packaging will be required to complete collateral courses to make up any deficiencies, in addition to the normal program requirements.

Specific criteria include:

1. Grade Point Average: For the last two years of the undergraduate program (approximately 85-90 term hours or 60 semester hours), an average of 3.0 (B) or higher is normally required.
2. Academic and Personal Statements: The Academic Statement should include interest areas and a brief plan of study, if possible. If a thesis is planned, the subject of the thesis study must be within the capabilities of and consistent with the goals of the School at the time of application. (See application form for guidelines for Academic Statement, stating your plans for graduate study and your professional career. See also, the attached list of faculty and research interests in Appendix 2.) The separate Personal Statement should include those aspects of your background and experiences that motivate your desire to pursue the degree, as well as any factors that you feel make you worthy of special consideration for admission.
3. Three letters of recommendation in support of the application.
4. Graduate Record Examination: Scores will be used to aid in admission decisions. No minimum required score has been established
5. Completion of the equivalent of the undergraduate program. A graduate student admitted with deficiencies in academic background will be required to take courses to remediate these deficiencies, in addition to regular program requirements.
  - (a) Applicants to the graduate program are expected to have a year of college level chemistry (including introductory organic chemistry), a year of college level physics, and a semester of calculus. Prospective students who do not have this background are encouraged to take equivalent courses at a community college or university in their locale prior to coming to Michigan State University, as completion of these courses is ordinarily required before admission to the M.S. program.
  - (b) Students who do not have an undergraduate degree in packaging are required to complete the equivalent of the following basic packaging courses: PKG 221, 322, 323, and 432, with a minimum GPA of 3.00. A student may also fulfill a course requirement by demonstrating knowledge in the course areas (see Waiver Policy, Section 11.3). Credits earned in these collateral courses do not count toward the minimum credit requirements for the M.S. degree. See 5 (d) below for substitutions.
  - (c) Students must also have the equivalent of PKG 410. Students who have not completed or waived this course will be required to complete it as part of their M.S. program. Credits earned in this course do count towards the minimum credit requirements for the M.S. degree.
  - (d) Three special courses for graduate students have been designed to facilitate completion of the collateral requirements. PKG 801 can be substituted for PKG 221, 322, and 323. PKG 803 can be substituted for PKG 410. PKG 804 can be substituted for 432. PKG 801 is offered fall semester and PKG 803 and 804 are offered spring semester. All three courses are offered on-line only, but are available to on-campus students. None of these courses can be applied to the 30 credits required for the M.S. degree.



### 3.3 Dual Enrollment by Undergraduates

Dual enrollment provides an opportunity for academically talented undergraduate students to enroll in graduate courses and conduct research towards a graduate degree while completing the last two years of their bachelor's degree(s) programs.

To be considered for dual enrollment, the student must first file an Application for Admission to Graduate Study as early as their Junior year. Subsequent to admission to a graduate program, in regular status, the student must complete a Request for Dual Enrollment Status form, available from the Office of the Registrar. A student who is accepted for dual enrollment can be admitted to both the undergraduate and graduate degree program upon reaching junior standing. Dual enrollment courses should be declared within the beginning of junior year.

Within the first semester of dual enrollment, the student's graduate degree program the graduate director will help the student to identify an advisor must be identified and/or the appropriate graduate degree guidance committee established. The advisor and/or committee assist the student in developing a program of study for the graduate degree. Admission to graduate study and the Request for Dual Enrollment Status form must both be approved before work to apply toward a graduate degree program is undertaken. Credits completed prior to admission to graduate study *cannot* be applied toward a graduate degree program.

A student will be classified as an undergraduate until the minimum number of credits required for a first bachelor's degree is completed. When the student is classified as a graduate student, eligibility begins for graduate assistantships, other forms of graduate student financial aid, or those services and prerogatives normally reserved for graduate students.

A student pays undergraduate tuition up to the total number of credits required for a first bachelor's degree(s) in his/her major(s), at which point graduate tuition is applicable and students are eligible for graduate fellowships and assistantships. If approved by the graduate program, a maximum of nine credits, at the 400-level or higher, from the undergraduate degree program can be applied toward the requirements for the graduate degree program for credits completed after admission to graduate study. Course credits cannot be separated and total credits must be nine or lower. See your Advisor for additional details. Credits applied to a master's degree are not eligible to be applied to any other degree program.

In semesters when the student is dually enrolled, federal financial aid designated for the first bachelor's degree (Federal Pell Grant and Federal Supplemental Educational Opportunity Grant (SEOG)) will be determined based upon the number of undergraduate credits only. Awards will be manually adjusted as necessary once the student is registered. Students are not eligible for financial aid as a graduate student until the semester after the minimum number of credits required for the first bachelor's degree has been earned.

The policy in full can be found at <http://www.reg.msu.edu/AcademicPrograms/Print.asp?Section=328>.

### 3.4 Readmission

A packaging graduate student seeking re-enrollment after an absence should follow the [Office of the Registrar](#) instructions for Graduate Education – Readmission to Original Program or Readmission with Change of Program, where an on-line application is available. Readmission is required if more than 12 months will elapse between enrollments. A student who has not been enrolled for less than 12 months is not required to request readmission, and can simply enroll in

classes. International students should contact the Office for International Students and Scholars, as special requirements may apply. PhD students should check with their former major professor to be sure that the professor is still willing to serve as the student's major professor, and discuss funding if this was offered before the student left MSU.

### 3.5 International Students

#### **On-campus Programs:**

Applications from prospective international students must be received by or before the deadlines indicated in the earlier sections.

If the application for admission is approved, a certificate of acceptance to the University and a U.S. Department of Justice I-20 form will be mailed by either the MSU Office of Admissions or the MSU OISS. The School of Packaging does not handle I-20s. **No prospective international student should plan to enter the United States before receiving both a certificate of acceptance and an I-20.** It will be necessary to present the certificate upon application for a student visa, and again upon arrival at the University. The Office for International Students and Scholars issues these documents, following recommendation by the Office of Admissions, and will remain in direct contact with each applicant. For students entering the on-line program, no visa documents are needed and none will be issued.

As of spring 2017, if students are admitted on a provisional basis because of language proficiency requirements, they can be issued an I-20 for language studies only. This I-20 is limited to a maximum of two (2) years. The student would need to be tested at the English Language Center upon arrival and begin studying in the English level determined by that test. Once the student meets the departmental requirements for language, the student may be issued a degree-seeking I-20. If the student has not met the stated language proficiency requirement for department/program admission at the end of two years, the student cannot continue to enroll for courses.

The international student must provide evidence of financial ability to pursue a graduate program at MSU before the certificate of acceptance to the University will be mailed. Details of the procedures and amount required, as well as the Affidavit of Support for Graduate International Students, can be found at The Graduate School website at <https://grad.msu.edu/internationalapplicants> under "financial proof". M.S. students should not expect financial aid from the University. Financial proof is not required for on-line students.

International students who enroll in the University are required to buy the University student insurance, or to demonstrate that they have equivalent coverage. Details about requirements can be obtained from the Office for International Students and Scholars. Information about the student insurance program can be obtained from the [MSU Human Resources Office](https://www.hr.msu.edu/benefits/students/health/), or <https://www.hr.msu.edu/benefits/students/health/>. This requirement does not apply to students in the on-line program.

All applicants without full native fluency in English must demonstrate proficiency by submitting scores from either the Test of English as a Foreign Language (TOEFL), Michigan English Language Assessment Battery (MELAB), MSU English Language Test (MSUFLT), or International English Language Testing System (IELTS).

For up to date information on minimum scores for both regular and provisionally admission, go to <https://grad.msu.edu/english-language-competency>

Applicants who do not meet the minimum requirements for provisional admission will not be admitted to academic programs. They may apply directly to the English Language Center for study of English only. Any questions about these requirements should be directed to the English Language Center at <http://elc.msu.edu/>.

Note: **Hardcopies of official IELTS scores, in official envelopes, must be mailed by the testing agency directly to the School of Packaging OR to the Office of Admission.** Uploaded copies will be treated as unofficial; we must have official hardcopies.

### **On-line (MS only) Program:**

Applications and requirements from prospective international students must be received by the deadlines (or before) indicated in the earlier sections. Online program application requirements are the same as the on-campus program with the following exceptions:

1. Financial proof is not required
2. An I-20 will not be sent
3. International students can request Health Insurance waivers under certain circumstances; go to <https://oiss.isp.msu.edu/health-wellness-and-safety/us-health-care-insurance/> for the full instructions and information.

## **4. DEGREE REQUIREMENTS**

### **4.1 All Programs**

All students must meet the University and College requirements as stated in the current *Academic Programs* publication. Such regulations appear in the section on University Graduate Degree Programs and in the section devoted to the regulations of the College of Agriculture and Natural Resources, as well as in the section for the School of Packaging. Each student is responsible for understanding these regulations. Some of these, along with the School of Packaging requirements, are outlined below.

International students admitted provisionally due to English Language deficiencies must correct that deficiency within two consecutive semesters. Such students will be required to take courses at the English Language Center and will be restricted in the number (if any) of academic courses they will be allowed to take.

Students admitted provisionally for other reasons will be required to meet the conditions specified in the student's admission letter.

Residency requirements and time limits shall be as published in the current issue of the *Academic Programs* catalog. Currently, the time limit for a master's degree is 5 years, and for a doctoral degree is 8 years. Application for extension of the time limit shall be submitted to the School and transmitted for approval by the Dean of the College and the Dean of the Graduate School. The M.S. program requires a minimum of 6 credits to be earned in residence on campus. MSU on-line courses are considered on-campus courses. For the Ph.D., one year of residence is required after first enrollment for doctoral degree credit. One year consists of two consecutive semesters involving the completion of at least 6 credits of graduate work each semester.

All course work must be completed with a minimum GPA of 3.0. Students must be enrolled in the University during the semesters in which comprehensive and final oral examinations are completed. Exceptions may be granted by the Dean of the Graduate School for M.S. final oral examinations or for Ph.D. comprehensive examinations conducting during summer semester, provided the student was enrolled the previous spring semester or the following fall semester.

In order to be considered full-time for academic purposes, students must carry the minimum number of credits per semester or summer session as defined below:

- Master's without assistantship: 9 credits minimum per semester
- Master's with assistantship: 6 credits minimum per semester
- Doctoral without assistantship: 6 credits minimum per semester
- Doctoral with assistantship: 3 credits per semester
- Doctoral student who have passed all required comprehensive exams: 1 credit per semester
- All graduate assistants are classified as full-time students during the semester (s) of their appointments as long as they are enrolled for the minimum required credits for the assistantship.

International Students online course regulations U.S. Immigration Regulations require that only one online or distance learning class per semester can be used to count toward the minimum number of credits needed for full-time enrollment as an F-1 student. If the total number of credits of all the in-person classes and one of the online classes are more than the required full-time credits, it is possible to enroll in as many online classes as the student wishes. For full information regarding F-1 and J-1 students visa, go to the OISS site at <https://oiss.isp.msu.edu/immigration1/visa-and-immigration-overview/>

If the major professor should leave the School of Packaging after the graduate program is planned and approved, the student has the right to continue the approved program under the supervision of a new major professor. The program may be changed only if it is the student's wish to do so.

When policies are changed, students who have been admitted before the change in policy have the right to choose to comply with the new policy or to complete the requirements following the policy that was in force when they were admitted.

Ph.D. students should have at least 1 article submitted to a refereed journal prior to scheduling their dissertation defense. Masters' students are also strongly encouraged to submit their research for publication.

In order to be certified to graduate, students must apply for graduation during the semester they anticipate graduating. The applicable form is available on-line, through the student's portal [student.msu.edu](http://student.msu.edu). If the student does not graduate during the intended semester, a new application must be submitted for the new semester of intended graduation.

## **Exit Survey**

We strongly urge all graduating students to complete a short on-line exit survey. This survey, for all students graduating with a Plan A or Plan B masters or with a Doctoral degree, was first introduced in May 2011. Only students who have applied for graduation have access. The survey asks questions about educational experiences in MSU graduate programs, as well as about

immediate professional plans. The Graduate School uses data from this survey when reviewing graduate programs and to guide decisions about services and initiatives for graduate students.

**The identity of all respondents will be kept confidential and only aggregate (group) information will be made available to faculty and administrators. Beginning Spring 2021, graduating master's students will receive their exit survey from MSU's license with 12Twenty, not from egr.msu.edu.**

- For master's exit surveys, direct questions to [CareerServices@csp.msu.edu](mailto:CareerServices@csp.msu.edu)
- For doctoral exit surveys, direct questions to [ExitSurvey@grd.msu.edu](mailto:ExitSurvey@grd.msu.edu)

The students will receive an e-mail message from the dean of the graduate school with a link to the survey. However, students do not need to wait for that e-mail message to complete the survey after applying for graduation. It takes about 5-10 minutes to complete the on-line survey. Below are the instructions for completing the survey and they are also available from <https://grad.msu.edu/etd/required-paperwork-and-surveys>

#### SED Survey (Doctoral Students ONLY)

PhD students are also asked to complete the SED Survey. Go to <https://grad.msu.edu/etd/required-paperwork-and-surveys> to log in and for information.

## 4.2 Ph.D. Program

### 4.2.1 Guidance Committee

Each student must, with the approval and assistance of their major professor, form a guidance committee consisting of at least four regular faculty members (including the major professor), three must be School of Packaging faculty, and one must be **from another department within MSU or from outside the MSU community with special approval**. The guidance committee must be formed within the first two semesters of doctoral study. It will meet periodically as needed during the student's course of study, preferably twice per year, including for administration of the comprehensive examination, and the final dissertation defense.

See sections 5 and 6 for additional information on selecting or changing the major professor and guidance committee. The student may make changes in the membership of the guidance committee, including the choice of major professor, with the concurrence of the Director of the School, in accordance with University, College, and School policies. The Director may similarly make changes in the committee, as needed, with the concurrence of the student, and in accordance with University, College, and School policies. [GSRR, section 2.4.2](#)

### 4.2.2 GradPlan

After the initial meeting of the guidance committee, the Ph.D. student is to complete their program electronically in GradPlan. The University has moved to electronic submission and approval for all doctoral student program planning and reporting, as well as dissertation submission. It is the responsibility of the Ph.D. student to initiate the filing of the program plan at <https://grad.msu.edu/gradplan>.

GradPlan **must be completed by the end of the student's second semester**. It identifies the guidance committee and tentative dissertation topic, in addition to the course work the student is

required to complete, and whether any transfer credits will be included in the program. Once the student submits the plan (and any subsequent changes) for approval, electronic circulation is provided for any needed checking and approvals. Individuals who need to approve are notified by e-mail.

Modifications to the program (including the composition of the guidance committee) require approval of the student and the committee members, and approval of the Director and the Dean, through submission of an official modification to the program using GradPlan. If the student should choose to enroll in courses not on the program, he/she should be aware that the course will not count toward graduate program requirements. Courses may not be added to or subtracted from a previously approved program after a final grade has been awarded. All courses taken before completion of the initial GradPlan are considered part of the student's academic program.

### **4.2.3 Comprehensive Examination**

The purpose of the comprehensive examination is for the student to demonstrate both depth of knowledge in the research area and a sound research plan that is reasonable in scope.

All Ph.D. students must take the comprehensive examination by the beginning of their third year in the program, unless the student's guidance committee requests an extension due to special circumstances, and the Graduate Committee approves that extension. The comprehensive will include a written document and an oral presentation as follows:

#### *Written Document*

1. A critical review of relevant literature which includes findings, a summary, and an evaluation of information that is relevant to the packaging related problem at hand.
2. The proposed research, with preliminary results if available, will be presented in the form of a grant proposal. The student will identify a potential granting source in consultation with the guidance committee. The student's guidance committee must approve the selected funding agency and the guidelines to be followed for writing the proposal.
3. The written comprehensive examination document will be electronically distributed by the student to the guidance committee, faculty, and Packaging Ph.D. students at least two weeks before the oral presentation.
4. Where intellectual property is a concern, the student will consult with the guidance committee to determine the appropriate level of detail to include in the document and oral presentation.

#### *Oral Presentation:*

1. The student will present the literature review and research plan to the faculty and graduate students of the School, in an open seminar to be scheduled by the student at least one month in advance for a two-hour block of time during fall or spring semester.
2. The first hour will consist of an approximately 45-minute presentation by the student, followed by open questions from the students in the audience.

3. At the end of the open question period, the graduate student audience will be excused, and there will be a period of questions to the graduate student from the members of the student's guidance committee and other School of Packaging faculty.

### **Evaluation:**

At the end of the questions, the student will be excused and the guidance committee and School of Packaging faculty will discuss the student's performance and research plan. The guidance committee will then vote by open ballot to determine whether the student has passed the examination.

A passing grade will require not more than one dissenting vote from among MSU regular faculty members of the guidance committee. A student who fails the comprehensive examination will be allowed to retake the examination the subsequent semester. Students who fail for a second time will be dismissed from the program.

## **4.2.4 Ph.D. Course Requirements**

### **Requirements for the Doctor of Philosophy Degree in Packaging**

The student must complete:

1. One of the following courses (3 credits):  
PKG 805 Advanced Packaging Dynamics, or 3  
PKG 815 Permeability Shelf Life 3
2. Both of the following courses (7 credits):  
PKG 825 Polymeric Packaging Materials 4  
PKG 860 Research Methods 3
3. An additional 3 credits of 800-level Packaging courses excluding PKG 890.
4. Complete 24 to 36 credits in PKG 999 Doctoral Dissertation Research.
5. Pass both a written and an oral comprehensive examination.
6. Complete a dissertation in one of the following areas of packaging: material science applications in packaging, food packaging, healthcare packaging, mass transport applications, or the dynamics and physical distribution aspects or human factors in packaging.
7. Successfully defend the dissertation.

Additional courses, beyond PKG 860 and PKG 985, must be completed as specified by the student's guidance committee and indicated in GradPlan.

It is expected that the program will consist of a minimum of 45 credits.

Students may not enroll for more than 36 credits of PKG 999. Full time status for a graduate student without an assistantship requires enrollment for 6 credits until the comprehensive examination is completed; it then drops to 1 credit. Therefore, to stay under the 36-credit limit, it is essential for students to complete their comprehensive examination in a timely manner.

#### **4.2.5 Transfer Credits**

On the recommendation of the guidance committee, up to 9 graduate credits can be transferred from other recognized graduate education institutions, provided at least a 3.0 grade using a 4-point scale is earned in each course transferred, and the courses were completed within the time limits for the degree.

#### **4.2.6 Research Seminars**

As part of the dissertation defense, each graduate student must present a seminar about their research to the faculty and students of the School, as well as to interested members of the public who wish to attend. Graduate students are also required to attend seminars presented by their fellow students, as well as seminars that are part of the School of Packaging Seminar Series.

#### **4.2.7 Dissertation**

The student must submit an acceptable doctoral dissertation. These must be submitted electronically via ProQuest after final approval by the major professor and the guidance committee.

Instructions for electronic submission of theses and dissertations are available at The Graduate School website through <https://grad.msu.edu/etd>. Deadlines for approval of the dissertation submission for graduation in particular semesters are as specified by the Graduate School. It should be noted that submission of the dissertation is not the same as approval. There is an interactive review process, and final approval can take anywhere from a few hours to weeks, depending upon the extent of the necessary revisions and the diligence of the student in completing the changes. The review by the Graduate School focuses on requirements for proper formatting and completion of all required forms. It is not a content review of the dissertation.

Deferred grades are given for all PKG 999 enrollments until the dissertation is completed. On successful completion, these grades are changed to pass; no numerical grade is given.

Students must provide an electronic copy of their final approved dissertation to their major professor. Students must also provide copies of all data and other relevant materials to their major professor.

#### **4.2.8 Final Oral Examination**

The final oral examination consists of a presentation to the faculty and graduate students of the School, as well as interested members of the public who wish to attend, followed by a defense of the dissertation with the guidance committee. The oral examination must be scheduled at least one week in advance. A complete copy of the dissertation must be provided to the members of the guidance committee at least two weeks prior to the scheduled final examination. When the Ph.D. final examination is completed, the major professor and members of the guidance committee will sign the appropriate form, indicating the examination results. The student's performance on the dissertation and the oral examination must be approved by a three-fourths vote of the guidance committee, with not more than one dissenting vote from among the Michigan State University regular faculty members of the committee, for a pass to be awarded.

#### **4.2.9 Summary of Ph.D. Requirements with Due Dates**



<b>Requirement</b>	<b>Due Date</b>
Select and be accepted by major professor	Time of admission
Select tentative dissertation topic: in one of the following areas of packaging: material science applications in packaging, food packaging, healthcare packaging, mass transport applications, or the dynamics and physical distribution aspects or human factors in packaging.	End of first year
Select guidance committee	End of first year
Submit GradPlan through the Graduate School	End of first year
Complete Application to Work in SoP Laboratory (Appendix 5)	Before beginning to work in laboratories
Complete EHS safety training and any other required training	Before beginning to work in laboratories
Obtain UCRIHS approval, if applicable (or approval of AUCAUC for work with vertebrate animals, if applicable)	Before beginning research involving human subjects/vertebrates
Attend School of Packaging seminars	As announced
Submit annual progress report to major professor	March 31 each year
Complete SoP responsible conduct of research, scholarship, and creative activities training (see Sec. 9)	End of first year followed by refresher annually
Complete requirements to remove "provisional" status, if applicable	End of first year or date specified
Pass comprehensive examination	First semester of third year
One of the following courses (3 credits): 1. PKG 805 Advanced Packaging Dynamics or PKG 815 Permeability Shelf Life  2. Both of the following courses (7 credits): PKG 825 Polymeric Packaging Materials and PKG 860 Research Methods 3. An additional 3 credits of 800-level Packaging courses excluding PKG 890. 4. Complete 24 to 36 credits in PKG 999 Doctoral Dissertation Research.	
Complete other course requirements specified in GradPlan	Graduation
Complete all course work with GPA at least 3.0	Graduation
Meet residency requirement, 2 consecutive semesters, 6 credits minimum each semester	Graduation
Apply for graduation	Early in semester graduation anticipated
Submit at least one publication to a refereed journal	Before scheduling dissertation defense
Provide "final" copy of dissertation, approved by major professor, to committee, in format specified by Graduate School	At least 2 weeks prior to defense
Schedule oral examination	At least 1 week prior to defense

Provide abstract of dissertation to Graduate Director for announcement of presentation date to graduate students and faculty	At least 1 week prior to defense
Pass oral examination (must be enrolled this semester)	Graduation
Complete dissertation revisions, submit electronic copy of dissertation via ProQuest, complete necessary corrections for acceptance	Graduation
Submit 1 electronic copy of accepted version of dissertation to the School of Packaging	Graduation
Complete all requirements within 8 years	Graduation
Clean out and relinquish desk; turn in keys	Before leaving campus
Clean up laboratory, properly dispose of research materials or pass on to major professor or new user, complete laboratory checkout form	Before leaving campus
Determine with major professor repository for original research data	Before leaving campus
Leave forwarding addresses and telephone numbers, both work and residence	Before leaving campus
Provide salary information for statistical compilation	Optional
Complete exit survey	After applying for graduation, the Dean of the Graduate School will email message the student a link to the survey.
PhD Complete the Survey of Earned Doctorates (SED) online at <a href="https://sed-ncses.org">https://sed-ncses.org</a>	

### 4.3 M.S. Programs

#### 4.3.1 All M.S. Programs

##### 4.3.1.1 Academic Program Plan Form

After the initial meeting of the guidance committee, the Master's student is to complete their program plan electronically in GradPlan. The University has moved to electronic submission and approval for all Graduate student program planning and reporting, as well as thesis submission. It is the responsibility of the MS student to initiate the filing of the program plan at <https://grad.msu.edu/gradplan>. GradPlan must be approved by the major professor and other committee members, **by the time the student completes 13 program credits or before the end of the second semester** towards their M.S. degree. (Note: this excludes collateral credits.) A hold will be put on the academic account of any student who is delinquent in completing GradPlan.

Students will be required to follow their approved programs. Changes in the program may be initiated by either the student or the major professor with the concurrence of the other and approved by submission of the appropriate form (see Appendix 5). If the student should choose to enroll in courses not on the program, he/she should be aware that the course will not count toward graduate program requirements. Courses may not be added to or subtracted from an approved program after a final grade has been awarded. All courses taken before completion of the initial Academic Program Plan form are considered part of the student's academic program.

#### **4.3.1.2 Statistics**

All graduate students must demonstrate an understanding of statistics. This requirement can be met by an appropriate course as part of the M.S. program, or by having taken a basic statistics course as an undergraduate.

#### **4.3.1.3 Overseas Study**

On approval of the guidance committee, one 3-4 credit overseas study program may be used as part of the M.S. program. The policy of the School of Packaging is that a second of such a program may not be used as part of the 30 required MS credits.

#### **4.3.1.4 Transfer Credits**

A maximum of 9 credits of graduate work can be accepted in transfer from another graduate or Lifelong Education program, either at MSU or at another recognized university or college. These credits must be earned within the 5-year time limit for degree completion, and the equivalent of at least a 3.0 (B) grade must have been earned in each course transferred. The MS 5-year time limit for Packaging starts with the first class that is part of the degree credits. The student must provide an original transcript, and a formal request for transfer of the credits must be submitted by the student's major professor.

#### **4.3.1.5 Seminars**

The School of Packaging has a seminar program in which invited speakers present on subjects of interest several times each fall and spring semester. Many of the speakers are experts from industry or other academic institutions. Furthermore, as part of the Ph.D. and Plan A M.S. oral examination defense, each graduate student must present a seminar about his/her thesis research to the faculty and students of the School.

All on-campus graduate students are required to attend these seminars to be able to graduate. Attendance is taken, and students with a legitimate excuse (such as class, work, or illness) should inform the Graduate Director in writing so the absence can be excused. The attendance requirement is waived for students in the on-line program.

#### **4.3.1.6 Annual Evaluation**

Every year submit annual progress report to Major Professor by March 31, using the Annual Progress Report for Ph.D. Students form, for completion and forwarding to Graduate Director.

### **4.3.2 Additional Requirements for M.S. Plan A – Thesis**

#### **4.3.2.1 Major Professor and Thesis Guidance Committee**

Each student will select and be accepted by a major professor from the regular faculty of the School of Packaging, to serve as the student's advisor and guide their thesis work. Dr. Maria Rubino, Graduate Director will serve as the student's advisor for all MS Plan A students until a major professor is chosen. For all MS Plan B students, both on campus and online, Aaron Tucker will serve as the advisor for the length of the program. The major professor must be chosen before completion of 13 program credits.

Each student must, with the approval and assistance of their major professor, form a guidance committee consisting of at least three regular faculty members (including the major professor); two must be School of Packaging faculty, and one must be from outside the School of Packaging, either from another department within MSU or from outside the MSU community with special approval. The guidance committee must be formed before completion of 13 program credits. Faculty having joint appointments may represent a department other than the School of Packaging provided their appointment in Packaging is less than 50%.

It is strongly recommended that students prepare a thesis proposal for review by committee members prior to beginning their research or shortly thereafter. This is especially valuable as a document to submit to prospective committee members, and as a starting point for outlining the precise research work to be accomplished for the degree.

See sections 5 and 6 for additional information on selecting or changing the major professor and guidance committee. The student may make changes in the membership of the guidance committee, including the choice of major professor, with the concurrence of the Director of the School, in accordance with University, College, and School policies. The Director may similarly make changes in the committee, with the concurrence of the student, and in accordance with University, College, and School policies.

#### 4.3.2.2 Plan A Requirements

The master's degree program in packaging is available under either Plan A (with thesis) or Plan B (without thesis). A total of 30 credits is required for the degree under Plan A or Plan B. The student's program of study must be approved by either the student's guidance committee (Plan A) or the student's major professor (Plan B).

Criteria #	Course ID	Course name	credits	Notes
	PKG 825	Polymeric packaging materials	4	
	PKG 860	Research methods	3	
	PKG 805 or PKG 815	Advanced packaging materials, permeability, and shelf life	3, 3	
	An additional 3 credits in 800-level or above PKG courses			Excluding PKG 888, PKG 890, PKG 899
	At least 6, at most 8 credits of PKG 899			
	15 credits at the 400-level PKG courses			
	In total, more than 15 credits at the 800-level PKG courses			

	Demonstrate an understanding of basic statistics			
M: students with no background in Packaging	PKG 801, PKG 803, PKG 804	PKG Materials; Distribution; Machinery	801 4 credits; 803 & 804 2 credits each	Credits do not count towards the degree credits

Note that courses can count in multiple categories.

Internship credits can be applied to the 30 credits required for M.S. programs. No more than 1 six-month internship will be approved as curricular practical training for international students.

Collateral courses (such as PKG 432, 801, 803 and 804) do not count towards the 30 required program credits.

#### 4. 3.2.3. Annual Evaluation

##### **For students in the Master Plan A:**

Submit annual progress report to major professor using the [Annual Progress Report for Plan A Master's Students](#) form, for completion and forwarding to Graduate Director

#### 4.3.2.4 Thesis

The student must submit an acceptable master's thesis. It must be submitted electronically via ProQuest after final approval by the major professor and the guidance committee.

Instructions for electronic submission of theses and dissertations are available at the Graduate School website, at <https://grad.msu.edu/etd/>. Deadlines for approval of the dissertation submission for graduation in particular semesters are as specified by the Graduate School. It should be noted that submission of the thesis is not the same as approval. There is an interactive review process, and final approval can take anywhere from a few hours to weeks, depending upon the extent of the necessary revisions and the diligence of the student in completing the changes. The review by the Graduate School focuses on requirements for proper formatting and completion of all required forms. It is not a content review of the thesis.

Deferred grades are given for all PKG 899 enrollments until the thesis is completed. On successful completion, these grades are changed to pass for the number of credits authorized by the Academic Program Plan form; no numerical grade is given.

Students must provide an electronic copy of their final approved thesis to their major professor. Students must also provide copies of all data and other relevant materials to their major professor.

#### 4.3.2.5 Final Oral Examination

The final oral examination consists of a presentation to the faculty and graduate students of the School, followed by a defense of the thesis with the guidance committee. The oral examination must be scheduled at least one week in advance. A complete copy of the thesis must be provided to the members of the guidance committee at least one week prior to the scheduled oral

examination. The student's performance on the thesis and the oral examination must be approved by a majority vote of the guidance committee for a pass to be awarded.

For Plan A, the student must be registered at MSU during the semester in which the examination or evaluation is administered (see Maximum and Minimum Credits). This requirement may be waived if the examination is administered during the summer session immediately following a spring semester during which the student was registered and/or prior to a fall semester in which the student will be registered.

#### 4.3.2.6 Summary of Thesis M.S. Plan A Requirements with Due Dates

Requirement	Due Date
Select and be accepted by major professor (Optional form in Appendix 5)	Before completion of 13 degree credits
Select tentative thesis topic	Before completion of 13 degree credits
Select guidance committee	Before completion of 13 degree credits
Submit Academic Program Plan form signed by all committee members (Appendix 5)	Before completion of 13 degree credits
Complete Application to Work in SoP Laboratory (Appendix 5)	Before beginning to work in laboratories
Complete EHS safety training and any other required training	Before beginning to work in laboratories
Obtain UCRIHS approval, if applicable (or approval of AUCAUC for work with vertebrate animals, if applicable)	Before beginning research involving human subjects/vertebrates
Attend School of Packaging seminars	As announced
Submit annual progress report to major professor	March 31 each year
Complete SoP responsible conduct of research, scholarship, and creative activities training (see Sec. 9)	End of first year followed by refresher annually
Complete requirements to remove "provisional" status, if applicable	End of first year or date specified
Complete any required collateral courses with GPA of at least 3.00	Graduation
Complete PKG 825 and PKG 860	Graduation
Complete PKG 805 or PKG 815	Graduation
Complete 6-8 credits of PKG 899	Graduation
Complete at least 16 credits in PKG	Graduation
Complete at least 16 credits at 800+ level	Graduation
Complete other course requirements specified in the Academic Program Plan form, for total of at least 30 credits, not including collaterals. The minimum passing grade in a course is 2.0 for graduate students.	Graduation
Complete all course work with GPA at least 3.0	Graduation
Meet residency requirement, minimum 6 credits earned on campus	Graduation

Apply for graduation	Early in semester graduation anticipated
Provide “final” copy of thesis, approved by major professor, to committee, in format specified by Graduate School	At least 1 week prior to defense
Schedule oral examination	At least 1 week prior to defense
Provide abstract of thesis to Graduate Director for announcement of presentation date to graduate students and faculty	At least 1 week prior to defense
Pass oral examination (must be enrolled at MSU the semester the exam is completed))	Graduation
Complete thesis revisions, submit electronic copy of thesis via ProQuest, complete necessary corrections for acceptance	Graduation
Submit 1 electronic copy of accepted version of thesis to the Major Profess along with copies of all data and other relevant materials.	Graduation
Complete all requirements within 5 years	Graduation
Clean out and relinquish desk; turn in keys (if applicable)	Before leaving campus
Clean up laboratory, properly dispose of research materials or pass on to major professor or new user, complete laboratory checkout form	Before leaving campus
Determine with major professor repository for original research data	Before leaving campus
Leave forwarding addresses and telephone numbers, both work and residence	Before leaving campus
Provide salary information for statistical compilation	Optional
Complete exit survey	After applying for graduation, the Dean of the Graduate School will send the student a link to the survey.

### 4.3.3 Additional requirements for M.S. Plan B - Non-thesis

#### 4.3.3.1 Plan B Major Professor and Committee

The Graduate Director and the chair of the School of Packaging Graduate Committee serve as the major professor and guidance committee for Master’s Plan B (non-thesis)

#### 4.3.3.2 Plan B Requirements

The master’s degree program in packaging for Plan B is without thesis. A total of 30 credits is required for the degree. The student’s program of study must be discussed with the MS Plan B advisor, and approved by the Graduate Director and the current chair of the Graduate Committee.

### Requirements for Plan B

The student must:

1. Complete a minimum of 30 credits with required and approved coursework.
2. Complete a minimum of 16 credits at the 800 level.
3. A maximum of 14 credits can be completed at the 400 level.
4. Demonstrate an understanding of basic statistics.
5. Have the Program Plan completed by the end of the second semester or after 15 degree credits.

### Course Requirements for Plan B

1. Packaging 805
2. Packaging 815
3. Packaging 825.
4. An additional 6 credits in 800-900 level Packaging courses excluding Packaging 888, 890, and 899.
5. Pass a final Plan B capstone paper.

Note that courses can count in multiple categories.

Collateral courses (such as 801, 803 and 804) do not count towards the 30 required program credits.

#### 4.3.3.3 Annual Evaluation Plan B students:

Submit annual progress report to major professor using the [Annual Progress Report for Plan B Master's Students](#) form, for completion and forwarding to Graduate Director

#### 4.3.3.4 Plan B Capstone Paper

A **final Capstone Paper** is required of all Plan B M.S. students **during the last semester of their program**. The student must be registered at MSU during the semester in which the Capstone Paper is administered (see Maximum and Minimum Credits). This requirement may be waived if the examination is administered during the summer session immediately following a spring semester during which the student was registered and/or prior to a fall semester in which the student will be registered. The examination will be graded by the Graduate Director and the current Chair of the Graduate Committee. , and consists of the following:

1. Student should meet with the Graduate Advisor and provide a summary of the research topic including at least 10 references.
2. After the Graduate Advisor approval of the research topic, the students must submit an approximately 5 to 8 page paper (not including references)
3. Students cannot use material/topic that the student has used in a previous course.

Structure of paper:

Introduction/background

Discuss main issue

Summary

Conclusion

References (minimum of 10)

1½ spaced, 1-inch margins all around, 12 pt. font



**Capstone Paper is due by week 12** of the semester and will be graded by week 14 of the semester.

**Evaluation Guidelines**

- 1) Follow the structure outlined
- 2) Minimum of 10 references
  - a. References must be properly cited in the body of the paper
  - b. References must be listed at the end of the paper in accepted bibliographic format
- 3) The paper should demonstrate understanding of the topic
- 4) The paper should be well organized and written.

If students fail:

Students may re-take the exam the next semester. They must enroll for a minimum of 1 credit to meet the University enrollment requirement.

Students who fail a second time will be dismissed from the program.

**4.3.3.5 Summary of Non-thesis M.S. Requirements with Due Dates**

<b>Requirement</b>	<b>Due Date</b>
Submit program plan via electronic GradPlan, detailing courses to be completed; approval needed by the Graduate Director and chair of SoP Graduate Committee. )	Before completion of 13 degree credits, or during the student second semester
Attend seminars presented by other graduate students (waived for on-line students)	As announced
Submit annual progress report to major professor using the <a href="#">Annual Progress Report for Plan B Master's Students</a> form, for completion and forwarding to Graduate Director	March 31 each year
Complete requirements to remove "provisional" status, if applicable	End of first year or date specified
Complete any required collateral courses with GPA of at least 3.00	Graduation
Complete PKG 825, 805 and 815	Graduation
Complete at least 3 additional credits of 800 level PKG courses excluding PKG 890 and 899	Graduation
Complete at least 16 credits in PKG	Graduation
Complete at least 16 credits at 800+ level	Graduation
Complete other course requirements specified in the Academic Program Planform, for total of at least 30 credits, not including collaterals. The minimum passing grade in a course is 2.0 for graduate students.	Graduation
Complete all course work with GPA at least 3.0	Graduation
Apply for graduation	Early in semester graduation anticipated
Submit satisfactory final examination paper (must be enrolled at MSU this semester)	By week 12 of final semester (will be graded by week 14)

Complete all requirements within 5 years	Graduation
Clean out and relinquish desk; turn in keys (if applicable)	Before leaving campus
Leave forwarding addresses and telephone numbers, both work and residence	Before leaving campus
Provide salary information for statistical compilation	Optional
Complete exit survey	After applying for graduation

#### 4.4 Specializations

Michigan State University offers the opportunity for students to formally specialize in a multidisciplinary area, primarily through completion of a set of courses, in addition to meeting the requirements for the degree in the student's major. Completion of a specialization is noted on the student's transcript. Most specializations are available only to students in a specified set of majors.

One specialization that may be of particular interest to Packaging students is the Food Safety Specialization. Details on the requirements can be obtained from the Graduate Director or from the National Food Safety and Toxicology Center, 165 Food Safety & Toxicology Bldg.

The specialization in Environmental Science and Policy may also be of interest. A complete list of graduate specializations is available at the Office of the Registrar or by going to <https://reg.msu.edu/AcademicPrograms/Programs.aspx?PType=SPCG>.

### 5. SELECTION OF ADVISOR

#### 5.1 Ph.D. Dissertation Advisor (Major Professor)

Selection of the major professor is done prior to admission of students to the Ph.D. program. Applicants are encouraged to correspond with faculty they identify as possible major professors, prior to consideration of the student's application. Admission to the Ph.D. requires that at least one faculty member be identified as willing to serve as the student's major professor.

The Graduate Director will, upon request, direct applicants to faculty working in the student's areas of interest. A listing of faculty and their interest areas is also provided in Appendix 2, and information about faculty and their research areas is available on the School of Packaging website at <http://www.canr.msu.edu/packaging/faculty/>.

Students may change major professors, if they wish to do so, provided they reach an agreement with another faculty member to serve in that capacity. The (electronic) signature of the Director of the School on the student's GradPlan constitutes approval of the selection of major professor and composition of the guidance committee.

Students have both the responsibility to constitute their guidance committee and the right to concur with any changes in its membership. See [GSRR, section 2.4.2](#)

#### 5.2 M.S. Advisor - Plan A M.S. program (Major Professor)

Selection of the major professor may be done prior to admission of students to the M.S. program, but may also be done during the student's first year in the program. The Graduate Director serves as advisor to all M.S. Plan A students who have not yet chosen a major professor. Selection of the major professor and completion of the GradPlan **must** be done before the student finishes 13 credits towards the M.S. program or within the first academic year.

The Graduate Director will, upon request, direct students to faculty working in the student's areas of interest. A listing of faculty and their interest areas is also provided in Appendix 2, and information about faculty and their research areas is available on the School of Packaging web page at <http://www.canr.msu.edu/packaging/faculty/>.

The signature of the Director of the School on the student's Academic Program Plan form constitutes approval of the selection of major professor and composition of the guidance committee.

### **5.3 M.S. Advisor - Plan B M.S. program**

For students in the non-thesis (Plan B) M.S. program, Aaron Tucker serves as the student's advisor for the length of the program.

### **5.4 Choice of Major Professor (Ph.D. and M.S. Plan A programs)**

The choice of a major professor is a mutual decision between the student and the faculty member. Acceptance by a major professor is a condition of admission to the Ph.D. program, but not to the M.S. program.

Students are to choose faculty with whom they would like to work, and discuss with the faculty members the students and faculty member's interests and goals. A student is then to request a faculty member to serve as the student's major professor. The faculty member is to give currently enrolled students a decision within two weeks of the student's request. Applicants are to be given a decision as soon as practical.

The student's major professor is their primary academic advisor. The Graduate Director serves as academic advisor to all students who have not chosen a major professor, and also serves as a backup when the major professor is unavailable, or when otherwise needed.

If the major professor leaves the University before the student's degree program is completed, the student, major professor, and Director of the School shall discuss the situation and determine whether the major professor will continue to serve in that role, or whether a new major professor must be selected. An emeritus faculty member may continue to serve as a student's major professor. If the major professor has left the University on a status other than retirement, generally a new major professor must be selected, although the current major professor may continue to serve on the guidance committee in a supplementary role. In such cases, the Director will assist the student in selection of a new major professor, and ensure that the student's right to continue his/her program is protected.

### **5.5 Responsibilities of the Major Professor (or Graduate Director for Plan B M.S. students)**

Faculty advising of all graduate students should be consistent with the Guidelines for Graduate Student Advising and Mentoring Relationships: Guidelines for Graduate Student Advising and Mentoring Relationships: [MSU Guidelines for Graduate Student Mentoring and Advising](#). The major professor is responsible for assuring that each graduate student under his/her guidance receives information about

requirements and policies of the graduate program. The major professor will advise the graduate student on developing a program plan, including selection of guidance committee members, course work, research plan, and on resources available for carrying out the program.

The major professor will assist the student in selecting a thesis or dissertation topic that has realistic prospects for successful completion within an appropriate time frame, and will provide training and oversight in research rigor, theoretical and technical aspects of the thesis or dissertation research, and in professional integrity. But ultimately the Thesis Topic and direction needs to be established by the student.

Responsibilities of the major professor also include encouraging the graduate student to stay abreast of the literature and cutting-edge developments in the field. The major professor will help the student to develop professional skills in writing reports, papers, and grant proposals, making professional presentations, establishing professional networks, interviewing, and evaluating manuscripts and papers, as appropriate.

The major professor is responsible for providing regular feedback on the student's progress towards degree completion, including feedback on research activities, course work, and teaching as appropriate, and providing constructive criticism if the student's progress does not meet expectations.

The major professor will help the graduate student develop into a successful professional and colleague, including encouraging the student to participate and disseminate results of research in the appropriate scholarly or public forums.

Another responsibility of the major professor is to facilitate the student's career development, including advising them on appropriate job and career options, and on preparation of application materials for appropriate fellowship, scholarship, and other relevant opportunities.

The major professor also will write letters of reference for appropriate fellowship, scholarship, award, and job opportunities.

If the major professor is on leave or extended absence, he/she will provide for supervision and advising of the graduate student during that absence.

The Graduate Plan B Advisor will meet with the Master Plan B student annually for their Annual Progress evaluation. Also, extra meetings could be necessary in order to advise the students on the selection of courses or on career opportunities that could be of interest for the student and may require advice. For guidance with the final Capstone Paper, the student should see the MS Plan B Advisor. Graduate Director.

## **5.6 Responsibilities of the Graduate Student**

The graduate student is responsible for learning and adhering to University, College, and School rules pertaining to graduate study and research, including those outlined in *Academic Programs*, *Graduate Student Rights and Responsibilities*, and *Student Rights and Responsibilities at Michigan State University*.

The student is responsible for meeting University, College, and School requirements for degree completion, and forming a guidance committee that meets University requirements and those outlined in

this Graduate Handbook. The student is responsible for reviewing the School of Packaging Graduate Handbook annually in order to ensure they are meeting all responsibilities.

The student must follow applicable disciplinary and scholarly codes of ethics in course work and in thesis or dissertation research. Honesty and integrity in collecting and maintaining data must be practiced without compromise. Applicable regulatory approval for research must be obtained in the early stages of thesis or dissertation work. In particular, safety training through Environmental Health & Safety (EHS) must be completed before any laboratory work is begun. UCRIHS approval must be obtained before beginning any research involving human subjects. AUCAUC approval must be obtained before beginning any work involving vertebrate animals. See Sect. 9 for details. Students are expected to maintain high standards of professional behavior and scholarly integrity. Failure to do so can lead to an allegation of misconduct in research and creative activities. Penalties can be severe, including dismissal of students found guilty of plagiarism or data falsification. For additional information see <http://www.rio.msu.edu/> and <http://grad.msu.edu/researchintegrity/>.

In particular, there have been a number of cases of scientific misconduct due apparently to unintentional plagiarism. In order to help avoid such instances, MSU provides “iThenticate” antiplagiarism software available on the [Desire2Learn](http://tech.msu.edu/ithenticate/) site. More information is available at <http://tech.msu.edu/ithenticate/>. Students may request an account which allows them to submit drafts of research articles and grant proposals to be scanned for missed citations and other mistakes that could be characterized as plagiarism, before they are submitted.

Graduate students are obligated to keep their faculty advisor and guidance committee apprised on a regular basis of their progress towards completion of the thesis or dissertation.

## **For Plan B students**

### **5.7 Responsibilities of the Chair of the School of Packaging Graduate Committee and of the Graduate Director**

The Graduate Director is responsible for advising all graduate students who do not yet have a major professor, and for monitoring the progress of these students. The Graduate Director will facilitate selection of a major professor and provide advice on matters such as course selection until a major professor is selected. The Graduate Director will also distribute to incoming students this Graduate Handbook.

The Graduate Director is also responsible for monitoring the progress of students in the graduate program by means of the graduate student reports and the student grade reports.

As described above, the Graduate Director serves as the primary graduate advisor for students in the Plan B M.S. program.

The Chair of the School of Packaging Graduate Committee and the Graduate Director have shared responsibility for scheduling and conducting the School’s orientation programs for new graduate students.

### **5.8 Responsibilities of the School Director**

The School Director shares responsibility with the guidance committee and the faculty in fostering the professional and career development of graduate students. The Director is responsible for monitoring the

performance of faculty advisors and guidance committees to ensure that graduate students are receiving appropriate mentoring.

The Director is responsible for working towards the fair resolution of conflicts between graduate students and faculty. In the event that a change of faculty advisor and/or guidance committee should become necessary, the School Director is responsible for facilitating this change.

*The School Director has delegated certain responsibilities such as signatures on Academic Program Plan forms to the Graduate Director.*

## 6. FORMATION OF THE GUIDANCE COMMITTEE

The student's guidance committee shares responsibility with the major professor for reviewing the graduate student's progress and guiding the student toward completion of course and program requirements.

For Ph.D. students, the guidance committee **must** be formed within the student's first year. The committee consists of at least 3 faculty of the School of Packaging and at least one MSU faculty member from outside the School. Faculty with joint appointments can be considered outside members if their appointment is less than 50% in the School.

For Plan A (thesis) M.S. students, the guidance committee **must** be formed before the student completes 13 program credits (collateral courses excluded). The committee consists of at least 2 faculty of the School of Packaging and at least one MSU faculty member from outside the School. Faculty with joint appointments can be considered outside members if their appointment is less than 50% in the School.

For Plan B (non-thesis) M.S. students, the guidance committee consists of the Graduate Director and the current chair of the School of Packaging Graduate Committee.

Michigan State University policy provides that the major professor (chair of the guidance committee) and faculty members of guidance committees be regular Michigan State University faculty, except as noted in what follows. Regular faculty are defined as tenure system faculty. Non-tenure-system faculty may serve as major professors and as members of guidance committees with the approval of the Dean of the Graduate School. Emeritus faculty may serve as members of guidance committees with the approval of the School Director. Emeritus faculty may continue to serve as major professors. While University policy allows specialists to serve as members or chairs of guidance committees with the approval of the Dean of the Graduate School, the School of Packaging does not generally approve such service, except as an additional member of the committee, beyond the minimum required number. In general, no more than 1 non-regular faculty member may serve on a Master's committee, and no more than 2 on a doctoral committee.

The major professor is responsible for assisting the student in selection of an appropriate guidance committee, within the established time requirements. The approval of the Director on the electronic GradPlan constitutes approval of the membership of the guidance committee.

Responsibilities of the guidance committee includes advising graduate students on course work and research, providing feedback and guidance concerning progress towards degree at least annually, administering exams in a fair and professional manner, and reviewing the thesis or dissertation in a timely, constructive, and critical manner.

In the event that a change in the composition of the guidance committee is needed, this change is initiated by submission of a revised Academic Program Plan form, with signatures of all the committee members, for approval to the Director, followed by forwarding to the Dean.

## **7. THESIS/DISSERTATION DEFENSE AND FINAL ORAL EXAMINATION**

### **7.1 Overview of Thesis/Dissertation Defense and Final Oral Examination**

The thesis or dissertation defense consists of presentation of the thesis or dissertation research to the guidance committee and the students and faculty of the School in an open seminar, followed by a question/answer session about the research. Following this open presentation, the guidance committee and the student will meet for the oral examination, which will include additional questions, discussion of necessary revisions in the document, etc. The student will then be briefly excused for discussion and vote by the guidance committee. Passing the oral examination requires a majority vote of the guidance committee for M.S. students. For Ph.D. students, passing requires a three-fourths vote with no more than one dissenting vote from among the regular Michigan State University faculty members of the committee. Students will be informed immediately whether they have passed or failed the oral examination.

A doctoral dissertation must be based on the student's original research, and make a significant contribution to knowledge. The research is to be under the direction of and acceptable to the guidance committee. The student is expected to take a major role in planning, as well as carrying out, the research program.

A master's thesis represents the student's original effort, but constitutes a less significant body of work than a dissertation, and usually involves a greater degree of direction by the major professor and the guidance committee.

Graduate students are strongly encouraged to prepare one or more submissions for publication, as appropriate, based on their thesis or dissertation work. Graduate students are also encouraged to take advantage of opportunities to present their work to professional audiences, such as at meetings of professional societies. Ph.D. students are expected to have at least 1 article submitted to a refereed journal prior to scheduling their dissertation defense.

It is common to use previously published articles where the student was the primary author in a dissertation. This should first be discussed with the student's guidance committee.

If supplementary material is to be submitted in addition to the main body of a thesis or dissertation, these supplemental materials will not be reviewed by the Graduate School for formatting requirements, but they must be acceptable by ProQuest and comply with ProQuest's criteria and storage limits. All supplementary materials need the written approval of the thesis/dissertation committee chair.

### **Requests for hold/embargo on publication of documents submitted to ProQuest**

Students submitting a thesis/dissertation to ProQuest now can request a hold/embargo of publication by ProQuest by contacting the Graduate School at [msuetds.approval@grd.msu.edu](mailto:msuetds.approval@grd.msu.edu) or calling 517 353 3220. In response to the request, the Graduate School will send directly to the student a form that needs to be completed and turned to the Graduate School prior to the document submission to ProQuest. The form needs to be signed by the student's major professor and by the Associate Dean of the student's

college. The request for the hold/embargo may be for six months, one year or two years. Requests for a period longer than six months must include a brief justification for the length of the requested hold/embargo.

### **Creating an Open Researcher and Contributor ID (ORCID) at the time of submission of electronic documents to ProQuest**

At the time of submission to ProQuest, authors now have the opportunity to create an ORCID that provides researchers with a unique identifier for linking their research outputs and activities. An ORCID:

- Improves recognition of research contributions
- Reduces form-filling (enter data once, re-use it often)
- Works with many institutions, funders, and publishers
- Is a requirement of many journal manuscript submission systems and grant application forms.

To learn more about ORCID go to: <https://vimeo.com/237730655>

Previously submitted theses and dissertations are available for review through the MSU Library.

### **7.2 Oral Examination Policies**

1. Oral examinations are to be scheduled at least one week in advance
2. All faculty and graduate students of the School are to be notified of the exam date, time, and location as soon as the exam is scheduled.
3. The first part of the oral examination is presentation of a seminar detailing the thesis/dissertation research or the project work. Graduate students are required, and faculty encouraged, to attend these presentations. Members of the public may also attend.
4. The second part of the oral examination is an examination of the candidate by the student's guidance committee.

## **8. SCHOOL POLICIES: ACADEMIC PERFORMANCE**

As mentioned earlier when presenting each program in the spring semester, each graduate student is to submit to the student's major professor a report on the student's activities and accomplishments for the preceding period. The progress report forms (differentiating between [Doctoral Students](#), [Masters Plan A](#) and [Masters Plan B](#)) are available on the Graduate School website, or at <https://grad.msu.edu/annual-evaluation-forms>. The completed form is due March 31 each year. Students are then to schedule a meeting with their major professor to complete the evaluation.

The major professor will complete the section on evaluation of student academic performance and the student and major professor will sign the form. Next, the form is forwarded to the Graduate Secretary to acquire the signature of the Packaging Director. The Graduate Plan B Advisor will complete the evaluation for Plan B M.S. students; the Graduate Director will complete the evaluation for students who do not yet have a major professor. A copy of the form will be returned to the student and the original form will become part of the student's departmental file. The graduate student has the right to attach a written response to the comments to the form if he/she wishes.

To maintain acceptable academic standing, students must complete any collateral course requirements within the first year of study, unless an extension is granted. A GPA of at least 3.0 must be earned in the



collateral courses. Students admitted on provisional status must also complete any additional requirements delineated in the admission letter, within the specified time frames. International students admitted with English language deficiencies must meet the requirements established by the English Language Center by the end of their first year of study. Students who fail to meet the above requirements will not be allowed to continue in the program.

For retention as a degree candidate, a grade point average of at least 3.0 in all courses that make up the formal program is required of all students. Any student falling below a 3.0 cumulative average for two consecutive semesters will be dismissed from the program.

A graduate student is also expected to abide by the regulations of the University and the program, to pursue his/her program with diligence, to seek the counsel of the advisor when needed, and to be aware of the schedules and deadlines which affect the work and program as they appear in the University calendar.

Grading policies of the School of Packaging follow the *Code of Teaching Responsibility* and other University regulations.

Standards of behavior for graduate students in the School of Packaging are identical with those to be found in the *Academic Programs* catalog. Each student is advised to study this publication at the time of admission and to note the changes which are indicated in subsequent issues as the university governance structure evolves.

Note that the *Graduate Student Rights and Responsibilities* document specifies that "The graduate student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." In particular, work submitted by students, graduates, or undergraduates, as their own must in fact be the student's work. Submitting work done by another person or work which is plagiarized is grounds for, at minimum, a penalty grade on the assignment and a formal report to the University. In more serious cases, it can lead to a failing grade for the course or even dismissal from the University. Students must understand that plagiarism is using the work of another without giving credit. Ideas obtained from others must be cited appropriately to identify the source or sources, even if the ideas are paraphrased in the student's words. If the words of another are used, these words must be put in quotation marks, as well as being appropriately cited. Failure to do both is plagiarism, and will have serious consequences.

As mentioned earlier all on-campus graduate students are required to attend the School of Packaging seminar series, oral examination seminars in which students present results of their thesis or dissertation research, and comprehensive examination seminars in which Ph.D. students present their dissertation proposals. Students having a valid reason for absence from such seminars are to clear that absence with the Graduate Director.

Students who are considered not to be making satisfactory progress towards their degree due to poor grades, lack of research progress, or lack of participation in the School's programs have the right to receive a warning and to be given an appropriate length of time to remedy the deficiency, normally one semester. If the student continues to fail to make satisfactory progress, the student will be dismissed from the program.

Ph.D. students must pass the comprehensive examination by the end of their 3<sup>rd</sup> year in the program. The comprehensive must be taken not later than the beginning of the student's 3<sup>rd</sup> year in the program.

If the student does not pass, they may take the examination a second time the next semester. Students who fail on the second attempt will be dismissed from the program.

Students have the right to examine their departmental file, with the exception of any recommendation letters to which the student has formally waived access rights. Students who wish to examine their file should contact the Graduate Director. The student's departmental file normally contains a copy of the application for graduate study, including any supporting materials sent by the student such as the personal statement and c.v.; copies of official transcripts and their translations, where appropriate; recommendation letters; reports of standardized test scores (GRE and TOEFL, where appropriate); grade reports; official Academic Program Plan forms; degree certification forms; and copies of miscellaneous correspondence sent on the student's behalf, where appropriate. Graduate assistant appointment forms are not part of the student's academic file. They are maintained separately in the Director's office.

## 9. SCHOOL POLICIES: INTEGRITY AND SAFETY IN RESEARCH AND CREATIVE ACTIVITIES

All faculty advisors and graduate students are responsible for understanding the contents of the Graduate School's document, *Guidelines for Integrity in Research and Creative Activities*, available through the Graduate School at:

<https://grad.msu.edu/researchintegrity> and included in Appendix 4 of this Handbook. Graduate students should also become familiar with other resources made available by the Graduate School at: <https://grad.msu.edu/researchintegrity/resources>.

Documenting Responsible Conduct of Research (RCR) training:

Students should be logging into the ABILITY information management system at <http://ora.msu.edu/train/> to complete their on-line RCR training. This is the system that must be used for proper documentation of training. This system has replaced SABA effective December 2018.

In compliance with University policy, all SoP graduate students involved in research activities must participate in the School's training and education programs on responsible conduct of research, scholarship, and creative activities. This requires a minimum of 5 hours of initial training, and an annual refresher of at least 3 hours. The current plan is outlined here:

### **All graduate professional, masters, and doctoral students**

#### **1. Year 1**

All new graduate and graduate professional students will complete 4 CITI online modules within the first year of enrollment in their program: *Completion of this requirement will be tracked in SABA*

- Introduction to the Responsible Conduct of Research
- Authorship
- Plagiarism
- Research Misconduct
- 

#### **2. Discussion-Based Training**

In addition to the requirements above, by MSU policy, all graduate and graduate professional students must complete a minimum of 6 hours of discussion-based training prior to receiving their degrees. These hours can be completed at any point in the graduate program, including during the first 2 years (e.g., as part of a course), or as part of the ongoing training requirement (for doctoral students). *For master's Plan A and PhD students' completion of this requirement will be recorded by the department in GradInfo as "Initial" training.*

### **Master's Plan A and Doctoral students**

For doctoral and MS Plan A students, the discussion requirement is to be completed by successful completion of PKG 860-Research Methods, in their first year of study.

Within the first 2 years of enrollment in their program, master's plan A and doctoral students will complete 3 additional MSU online training modules, to be selected from the following list. *Completion of this requirement will be tracked in SABA.*

- CITI Collaborative Research
- CITI Conflicts of Interest
- CITI Data Management
- CITI Financial Responsibility
- CITI Mentoring
- CITI Peer Review
- IACUC Tutorial for Animal Care Training (in <http://Train.ORA.msu.edu>)
- Human Research Protection/ IRB Certification (in <http://Train.ORA.msu.edu>)
- Rigor and Reproducibility Course (in production)

### **Master's Plan B students**

The additional 6 hours discussion-based training for Master's plan B students must be fulfilled by participation in selected lectures, class discussions, demonstrations, or other instructional sessions of PKG 860 (Research Methods) that will be presented as webinars. The classes will be live meetings transmitted over the Web and attended simultaneously by both on-campus and online students. The webinar will be interactive so that the students joining online will have the opportunity to ask questions and chat with the instructor. Since the webinar will be recorded and posted on D2L for the students not able to participate at the scheduled times, students can also submit their questions after the webinar through the questions pane in the control panel and see the answers posted later by the instructor.

The discussion-based training will be centered on the following topics:

- Peer review/critical analysis
- Confidentiality
- Mentorship
- Conflict of interest/conflict of commitment
- Data retention/management
- Regulatory compliance

### **In addition to 1, 2 and 3 above, doctoral students will complete:**

#### **3. Annual Refresher Training for Doctoral Students**

In addition to completion of requirements 1 and 2 above, doctoral students are required to complete 3 hours of annual refresher training, beginning in year 3. This can include discussion-based training and online courses beyond the 7 required in basic training. *Completion of this requirement will be recorded by the department in GradInfo as "Annual" training.*

**Note:** Students who are supported by NSF, NIH, or USDA grants may be required to complete additional specific training; they must meet the timeline and content requirements of training for that grant.

Students engaged in research involving human subjects or animal use must complete the

Michigan State University training modules for those subjects before submitting IRB or IACUC approvals. These modules may be completed as part of the training requirements below, or in addition to them.

All graduate student work in laboratories outside of regularly scheduled classes must have prior approval. The Application to Work in SoP Laboratory must be submitted to the Laboratory Manager and approved by the student's major professor as well as by the Laboratory Manager. No approval can be given unless the student has completed the Laboratory Safety training offered by the University Office of Environmental Health & Safety (EHS). Students must certify that they have completed this training before being allowed to work in any laboratory. Maintaining the School's compliance with safety regulations is a responsibility of all students working in School of Packaging laboratories. To complete the training, students should follow the "Training" link to "Chemical Hygiene and Laboratory Safety" on the [EHS](http://www.ehs.msu.edu) website. The training program, as well as the required annual refreshers, can be completed on-line at [http://www.ehs.msu.edu/chemical/chem\\_toc.htm](http://www.ehs.msu.edu/chemical/chem_toc.htm).

Use of specific laboratory equipment in the School requires completion of proper training and authorization by the faculty member in charge of that equipment. An updated list and description of the procedures to follow will be provided during the graduate student orientation program.

Use of biological materials, pathogenic organisms, radioactive substances, or certain hazardous chemicals requires additional training. The student's major professor will provide information about the required training in such cases. Regulations can be obtained from EHS (Environmental Health & Safety) at <http://www.ehs.msu.edu/>.

Any research involving human subjects or materials of human origin must be approved by UCRIHS, the **University Committee on Research Involving Human Subjects**, before any such research is initiated. This includes collection of data through surveys. If a student fails to obtain the appropriate prior approval, the thesis or dissertation containing such work will not be accepted, and the student will not graduate. Details of the requirements and the application are available at <http://hrpp.msu.edu/>. Application for approval must be submitted by the major professor jointly with the graduate student.

Similarly, any research involving vertebrate animals must be approved by AUCAUC, the **All-University Committee on Animal Use & Care**. Information can be found at <http://animalcare.msu.edu/>.

Misconduct in research and creative activities will not be tolerated. Misconduct includes fabrication or falsification of data or information, as well as plagiarism. It also includes serious or continuing non-compliance with government regulations pertaining to research, and retaliation against whistle blowers. It does not include honest errors or honest differences of opinion in the interpretation or judgment of data. Misconduct is an egregious violation of standards of integrity and is grounds for disciplinary action, including the termination of employment of faculty and staff, dismissal of students, and revocation of degrees. Faculty, staff, and students all have the responsibility to understand the University's policy on misconduct in research and creative activities, to report perceived acts of misconduct of which they have direct knowledge to the University Intellectual Integrity Officer, and to protect the rights and privacy of individuals making such reports in good faith.

### **University Policy About Dissemination of Graduate Students' Research.**

In keeping with MSU's public mission, the University requires that theses, dissertations, and abstracts will become public after the conferral of the degree; embargoes can only be pursued for a limited period (see [1] below). Results that are subject to restrictions for dissemination by funding agencies (see [2] below) cannot be part of any document submitted as a thesis or dissertation to the Graduate School.

### **[1] Hold/embargo on publication of documents submitted to ProQuest:**

Students submitting a thesis/dissertation to ProQuest now can request a hold/embargo of publication by ProQuest by contacting the Graduate School at [msuetds.approval@grd.msu.edu](mailto:msuetds.approval@grd.msu.edu). In response to the request, the Graduate School will send directly to the student a form that needs to be completed and turned to the Graduate School prior to submission of the document to ProQuest. The form needs to be signed by the student's major professor and by the Associate Dean of the student's college. The request for the hold/embargo may be for six months, one year or two years. Requests for a period longer than six months must include a written justification for the length of the hold/embargo.

### **[2] Graduate students' participating in University Research Organization (URO; <https://uro.egr.msu.edu/>):**

Graduate students involved in a URO project will receive both written documentation and a verbal explanation of any limitations or implications to their current or future academic progress prior to participating on the project. Students engaging in work for a URO project undergo a 2-step approval process before hiring: a consultation with a representative of the URO's office to explain the restrictions on the project, and an interview with the Graduate School Dean or Dean's designee to discuss the relationship, if any, between their work as graduate students and their participation in the project. Students must be informed that results that are subject to restrictions for dissemination cannot be part of any document submitted as a thesis or dissertation. As part of their degree program, all graduate students must have research options to ensure the generation of appropriate results to fulfill the degree requirements, and to have data for professional development activities that are integral to their graduate education (e.g., presentations at conferences and research seminars).

## **10. STUDENT CONDUCT AND CONFLICT RESOLUTION**

Rights and responsibilities, including codes of conduct, for graduate students are found in the *Graduate Student Rights and Responsibilities* document and the *Student Rights and Responsibilities at Michigan State University*. These are both available at [Spartan Life OnLine](http://splife.studentlife.msu.edu/) or by going to <http://splife.studentlife.msu.edu/>

Alleged violations by students of student regulations or University policies may be referred to the appropriate judiciary, as outlined in the Students' Rights and Responsibilities at Michigan State University report.

When graduate students feel that their rights and responsibilities have been violated, they are urged to first attempt to resolve such conflicts informally with the person or people responsible. This is particularly the case when such conflicts are between graduate students and their faculty advisors, due to the importance of these relationships.

If attempts to directly resolve the conflict informally between those involved are not successful or are not desired, the student has several options. The student may consult informally with the Graduate Director or the School Director. The student may also, or instead, consult with the University Ombudsperson. Information about the role of the Ombudsperson, as well as general advice, is available from the [Ombudsperson's web page](https://ombud.msu.edu/) at <https://ombud.msu.edu/>.

If the problem remains unresolved, the student may file a formal grievance. This must be submitted in writing to the Director of the School, and must include the alleged violations of the student's academic rights, and a proposed remedy which could be implemented by a responsible administrator. The statement must be signed by the student, and must specify in sufficient particularity to justify proceedings the point(s) forming the basis of the grievance, the person(s) and/or unit(s) against whom/which the grievance is filed, and the redress that is sought. Grievances must normally be initiated no later than the middle of the semester following the one wherein the alleged violation occurred (exclusive of summer semester). The grievance will be submitted by the Director to the appropriate hearing board. Grievances alleging violation of academic and professional rights must be initiated at the lowest administrative level feasible, which is normally the School.

The School has an established hearing board for hearing grievances filed by graduate students. It consists of three faculty (one serving as chair) and two graduate students. Faculty or students involved in or possessing other conflicts of interest in a case at issue shall be disqualified from sitting on the board for that specific case, and an alternate member will be selected. All members of the Hearing Board shall vote, except the chair of the board, who will vote only in the event of a tie.

The grievance procedure shall conform to University policies as delineated in the *Graduate Student Rights and Responsibilities* document. <https://grad.msu.edu/gsr>

The University has determined that an amorous or sexual relationship between a student and a faculty member, a graduate teaching assistant or another University employee who has educational responsibility for that student may impair or undermine the ongoing trust needed for effective teaching, learning and professional development. Because of the faculty member, graduate teaching assistant or other employee's authority or power over the student, inherently conflicting interests and perceptions of unfair advantage arise when a faculty member, graduate teaching assistant or other employee assumes or maintains educational responsibility for a student with whom the faculty member, graduate teaching assistant or other employee has engaged in amorous or sexual relations. Therefore, faculty members, graduate teaching assistants and other University employees who have educational responsibilities for students shall not assume or maintain educational responsibility for a student with whom the faculty member, graduate teaching assistant or other employee has engaged in amorous or sexual relations, even if such relations were consensual. A complete explanation of the policy can be found at [Spartan Life Online – Conflict of Interest](#).

Other guidelines for handling potential conflicts of interest can be found at [The Graduate School – Research Integrity](#).

## **11. OTHER SCHOOL POLICIES**

### **11.1 School Organization**

The School of Packaging has three standing committees - Curriculum, Graduate, and Advisory. These committees include student members, and welcome input from graduate students. Graduate student representatives to these committees are selected by the Packaging Graduate Association (PGA).

The membership of the Packaging Graduate Association (PGA) includes all graduate students in the School of Packaging. The PGA elects representatives to the School's Standing Committees, as discussed above, and to relevant College and University bodies such as the Council of Graduate Students (COGS).

## 11.2 Enrollment in Classes

Students enroll for classes on an annual basis. Enrollment occurs during spring semester for the subsequent academic year. Exact dates can be found in the “other important dates” section of the [University Academic Calendar](https://reg.msu.edu/ROInfo/Calendar/academic.aspx) at <https://reg.msu.edu/ROInfo/Calendar/academic.aspx>.

Graduate students have priority for enrollment, so students should be able to get the courses and sections they desire, provided they enroll on time. If students wait until undergraduates have enrolled, the classes may be full. The School is limited in its ability to assist in such circumstances, so it is very important that graduate students take advantage of their enrollment priority.

## 11.3 Waiver Policy for Required Undergraduate Core Courses

In certain circumstances, a graduate student may be able to waive one or more of the required undergraduate packaging courses that are listed as collateral requirements, and thus may not be required to enroll in the course. Outlines for these courses are provided in Appendix 3.

The following criteria have been set for waiver requests and approval:

1. A request for the waiver of a required undergraduate core course by a graduate student must be based on his/her work/academic experience and expertise gained prior to enrolling in the School. Knowledge gained while completing graduate studies will not be considered as a criterion for requesting a course waiver.
2. Requests for waiver of PKG 221, PKG 322, PKG 323, PKG 410 or PKG 432, including all supporting documentation, must be filed by the graduate student with the Graduate Director of the School of Packaging not later than the first day of classes of the student's first semester.
3. In addition to a letter requesting the waiver, documentation presented by the student may include:
  - A. transcripts from other programs with descriptions of course content
  - B. letters from employers
  - C. other evidence of related experience such as reports, patents, and publications.
4. A committee of faculty for each of the core courses will evaluate the documentation presented by the student. Examinations, if needed, will be scheduled the week prior to the beginning of classes, or within the first three days of classes. A final decision will be communicated not later than the fifth day of classes.

## 11.4 Departmental Facilities

### 11.4.1 Addresses, Mailboxes, and E-mail

Graduate students are responsible for notifying the School of their current home address and telephone number. Any changes should be reported promptly. This is of particular importance for international students, who must also report the change to the Office for International Students and Scholars, as failure to report a change of address can result in deportation.

All on-campus graduate students have a mailbox in the Graduate Student Office, Room 103 Packaging Building, which is used for department correspondence. (Personal correspondence should be directed to the student's home address.) The mailbox should be checked at least twice a week, preferably every day. It is an important way of getting information to students.

The School also frequently sends notices to graduate students by e-mail. A Graduate students should notify the Graduate Secretary and the Graduate Director of their current e-mail address, and should check

their e-mail on a regular basis. MSU makes free e-mail available to all students, and most of the computer laboratories on campus provide access to e-mail.

#### **11.4.2 Desks**

Due to a shortage of space, teaching assistants, Ph.D. students, and M.S. students actively engaged in research within the Packaging Building are given priority for desks. Requests for desk assignments should be made to Susan Barnaby, Room 130. Generally, MS Plan B students will not be assigned a desk. Lockers are available for graduate students who do not have desks. The Packaging Graduate Association (PGA) is responsible for assignment of lockers. Students are expected to keep their desk and surrounding area clean, and cannot use other desks for storage or change desks without asking the Graduate Secretary.

Note: Because of unusual circumstances for FS20 and SS21, no desks will be assigned to new students.

#### **11.4.3 Keys**

Graduate students working in the Packaging Building will be issued necessary keys by either Susan Barnaby or Tracy Lorenz, excluding lab keys. Lab keys must be authorized by the major professor and are distributed by the lab manager, Aaron Walworth. Keys must be returned by the time the student leaves the School. Access to the Packaging Building outside normal hours is authorized via ID card code through request to Heather Miller. **Students are responsible for ensuring that doors to the building remain closed during hours when the building is not open. Doors are never to be propped open and no unauthorized persons are to be admitted.** This is critical for the safety of students working in the building after hours, as well as to prevent theft of valuable research equipment and supplies.

#### **11.4.4 Computer Laboratory**

Graduate students can use the computers in the computer laboratory (Room 121) whenever the rooms are not being used for a class or other scheduled activity. Students are expected to take care not to transmit viruses or otherwise damage any equipment.

#### **11.4.5 Copies and Copier**

Graduate students are not allowed to use the department copy machine. When copies are needed for departmental functions, students must submit a copy request form at least one week prior to the work being needed.

#### **11.4.6 Supplies**

Supplies needed for teaching assistants will be provided by the department. TAs should request needed supplies from the secretarial staff. Supplies needed for research should be requested from the professor involved.

### **11.5 Travel**

#### **11.5.1 Travel Authorization**

All travel by graduate students that relates to official School of Packaging business, including that related to student research projects, requires prior approval through submission and signing of a Travel



Authorization form. This is essential, as unapproved travel is not covered by University insurance. General University rules about travel can be found at the MSU Travel Office website at <http://www.ctlr.msu.edu/COTravel/>, including a link to the Pre-Trip Authorization form. You must see Tracy Lorenz for travel authorizations.

### **11.5.2 Travel Funding**

Reimbursement for research-related travel expenses should be discussed with the major professor before any travel expenses are incurred. The student should clearly understand what expenses will and will not be authorized for reimbursement (within University maximums). Students should not assume that these expenses will be covered unless they have specific approval.

Both the University and the School of Packaging provide assistance in the form of travel grants or fellowships, under certain circumstances. Information about assistance is available through the Graduate School – Travel Funding or by going to <https://grad.msu.edu/travel>. Included on this page is a link to the travel funding application.

### **11.5.3 School of Packaging Travel Funding Process**

The School will award a travel grant of up to \$300 to graduate students for domestic travel and \$500 for international travel under the following procedures/conditions:

1. The student is traveling to a recognized professional meeting to present a technical paper (poster or oral) based on work conducted as part of their work within the School of Packaging.
2. Evidence of acceptance of the paper must be presented at the time of application for the award.
3. The student has discussed the paper and travel with the major professor who concurs with the proposed travel.
4. The travel must be in accordance with the Graduate Student Travel funding criteria, as provided by the Graduate School (available through the link in section 11.5.2).
5. The student must fill out the request form for TRAVEL FUNDING from the Graduate School before requesting support from the School of Packaging.
6. The student should present the request to the School's director at least 30 days before the travel occurs and provide an estimate of all costs.
7. No more than 1 award will be made to any one student in any academic year and summer.
8. The funds will be distributed to the student after the meeting via submission of a travel reimbursement form. The School of Packaging grant will not exceed the remaining cost of the trip after other grants are subtracted (\$300/\$500 is a maximum, not a guarantee).

## **11.6 Financial Assistance from School of Packaging**

### **11.6.1 Financial Assistance Opportunities**

Several types of financial assistance are offered to graduate students through the School of Packaging when funds are available. Scholarships provide a dollar award, usually as a one-time award. Fellowships provide a stipend for the semester.

Graduate assistantships, for either teaching or research, provide a stipend and other benefits in return for certain work responsibilities. The School also sometimes hires students on a part-time hourly basis, either for specific short-term projects or on a longer basis. These employment situations will be addressed in Section 12.

## 11.6.2 Application Procedures

Applications for several scholarships administered by the School are available from the undergraduate advisor, Aaron Tucker. The deadline is normally during fall semester, and will be announced by e-mail and through announcements in classes. Some scholarships are available only to undergraduates or to graduate students, and others to both. Some are restricted to permanent residents or citizens of the United States. Others are available to international students, as well.

Scholarships and fellowships not administered by the School are also announced as they become known to the School. These generally require an individual application form to be submitted to the sponsoring organization.

Applications for School of Packaging fellowships are made by letter to the chair of the School's Graduate Committee. Deadlines are announced by e-mail. These are normally available only to on-campus students. Priority is given to students who do not have assistantships. This fellowship money is quite limited, and is used for recruiting promising new students, as well as for retaining current students. Recruiting fellowships are not normally offered to new international students at the M.S. level.

Several prestigious fellowships for highly qualified new Ph.D. students are available through gifts that have been made to the School. Applicants for the Ph.D. program will be considered for these awards. These are generally made for a period of one year, with the expectation that recipients will be covered by an assistantship beginning in their second year.

Scholarships, fellowships, and waivers of out-of-state tuition generally carry no attached duties. For scholarships and fellowships, full-time enrollment is often a requirement. Any such conditions will be delineated during the application procedure or in the award letter.

Fellowships and scholarships are generally one-time awards. Receipt a second time requires reapplication, if such is permitted.

Graduate students must generally be in good standing to be considered for any type of financial assistance. Scholarship and fellowship awards may be based on a combination of performance and need.

## 11.7 Other Financial Aid Resources

The Graduate School maintains a funding opportunities website for graduate students, with information about fellowships, assistantships, and other financial assistance opportunities. It can be found at [The Graduate School – Funding Resources](http://grad.msu.edu/funding/) at <http://grad.msu.edu/funding/>.

Information on student employment at MSU is available through [Career Services Network](http://careernetwork.msu.edu/) at <http://careernetwork.msu.edu/>.

The [Office of Financial Aid](http://www.finaid.msu.edu/default.asp) at <http://www.finaid.msu.edu/default.asp>.

The [Council of Graduate Students](https://cogs.msu.edu/resources/services/loans/) (COGS) offers short-term loans. Information is available at <https://cogs.msu.edu/resources/services/loans/>.

## 11.8 Grief Absence Policy

For master's (Plan A), master's (Plan B) with research responsibilities, and doctoral students, it is the responsibility of the student to: a) notify their advisor/major professor and faculty of the courses in which they are enrolled of the need for a grief absence in a timely manner, but no later than one week from the student's initial knowledge of the situation, b) provide appropriate verification of the grief absence as specified by the advisor/major professor and faculty, and c) complete all missed work as determined in consultation with the advisor/major professor and faculty. It is the responsibility of the advisor/major professor to: a) determine with the student the expected period of absence – it is expected that some bereavement processes may be more extensive than others depending on individual circumstances, b) receive verification of the authenticity of a grief absence request upon the student's return, and c) make reasonable accommodations so that the student is not penalized due to a verified grief absence. If employed as a RA or TE, the graduate student must also notify their employer. Both employer and student will swiftly communicate to determine how the student's responsibilities will be covered during their absence. Graduate teaching assistants (TAs) should refer to the bereavement policy in the MSU GEU CBU Article 18. Students in the graduate professional colleges (CHM, COM, CVM, LAW) with their own grief absence policies are excluded from the above and should follow their own policies. Students who believe their rights under this policy have been violated should contact the University Ombudsperson.

## 12. WORK RELATED POLICIES

Graduate assistantships fall into two distinct categories, teaching assistantships and research assistantships. Although both have similar stipends and other benefits, there are important distinctions between them.

### 12.1 Teaching Assistants

Teaching assistantships provide a stipend in payment for teaching responsibilities. Teaching assistants are represented by a union, the Graduate Employees Union, GEU, and contract terms are determined by negotiation between the University and the union. The GEU website is <http://geuatmsu.org/>. Teaching assistants will be provided information about the GEU and their membership options when they are first appointed and annually thereafter. The GEU will also provide information about the policies and benefits operative under the current contract. The current contract can be found at <http://geuatmsu.org/about/geu-contract/>.

The MSU Teaching Assistant Program provides a variety of information, resources, and services for current and prospective teaching assistants through their web page at <http://tap.msu.edu/>.

International students whose first language is not English must obtain a satisfactory score (50 or better) on the English Language Center's SPEAK test, on the Educational Testing Service's Test of Spoken English (TSE), or on the ITA oral interview before they can be appointed as a teaching assistant with responsibilities that involve oral communication with undergraduate students. Details about the tests and procedures, including information about practice tests, are available at <https://grad.msu.edu/tap/speak>. The TSE is available for a fee, and can be taken as many times as a student wishes, but the score report cannot have been issued more than two years prior to the student's appointment as a TA. The SPEAK test is available at no charge to eligible students at MSU. The spoken section of TOEFL does not substitute for the SPEAK test. International students who are applying for a teaching assistant position but have not already passed one of these tests may request through the Graduate Director to be scheduled for the SPEAK test. Students with SPEAK scores of 45 are eligible to enroll in the ITA Speaking and Listening Class (ENG 097); students with SPEAK scores of 40 may enroll in this course with the

instructor's permission. After completion of English 097, the student is tested in the ITA Oral Interview (ITAOI). Students who have an interview score of 50 or higher satisfy the TA English requirement and are cleared for teaching. Students who score below 50 on their first interview have 2 semesters and up to 2 more opportunities to meet the requirement; to re-interview, students must sign up at the ELC office. If a student obtains a score of 45 on the SPEAK or the ITAOI and the School feels the test result was not reflective of the student's actual speaking ability, the School, through the Graduate Director, may ask the Review Board to independently evaluate the student's spoken English. The Board consists of a representative of the School of Packaging, two English Language Center representatives, and a representative of the Graduate School.

### **English Language Testing: MSU Policy Affecting International Teaching Assistants (ITAs)**

MSU candidates for TA appointments who were required to demonstrate English proficiency as a condition for regular admission to Michigan State University must also demonstrate that they meet a minimum standard of proficiency in spoken English before they can be assigned teaching work that involves oral communication with undergraduate students. Those ITAs who received a waiver of the TOEFL or of other accepted tests of English proficiency for admission, must also meet the requirement of proficiency in spoken English before they are assigned to teaching work that involves oral communication with undergraduate students. To meet this requirement, those ITAs may use any of three options listed below:

- Presenting a TOEFL iBT speaking section score of 27 or higher.
- Receiving a score of 50 or higher on the [MSU Speaking Test](#)
- Taking [AAE 451](#) or [AAE 452](#) (ITA language support courses) and receiving a score of 50 or higher on the [ITA Oral Interaction Test \(ITAOI\)](#).

Individual exceptions from these requirements (on a case-by-case basis in rare circumstances) will be considered by the Graduate School in consultation with the ELC upon the request of the department and with the endorsement of the Associate Dean of the College

**Those ITAs who received a waiver of the TOEFL or of other accepted tests of English proficiency for admission, must also meet the requirement of proficiency in spoken English before they are assigned to teaching work that involves oral communication with undergraduate students. To meet this requirement, those ITAs may use any of three options listed above. Individual exceptions from these requirements (on a case-by-case basis in rare circumstances) will be considered by the Graduate School in consultation with the ELC upon the request of the department and with the endorsement of the Associate Dean of the College.**

All students who wish to be considered for a teaching assistant position must submit a formal application. Application forms and instructions are available from the Graduate Director. Usually, applications are due in mid-spring semester for the following academic year.

An orientation for teaching assistants takes place early in the semester.

### **12.2 Research Assistants**

Research assistantships provide a stipend for research work. Research assistants are not represented by the GEU. Selection of research assistants is at the discretion of the faculty member providing the funding for the student. Individual faculty have established differing procedures, and there is no

coordinated application process. Students are advised to stay in contact with faculty doing the type of research in which they would like to participate, so they will be informed when opportunities arise.

### **12.3 Assistantship Benefits**

Both teaching and research assistantships include, in addition to the monthly stipend, exemption from out-of-state tuition, payment for up to 9 credits of tuition for fall and spring semester appointments, payment of most enrollment fees, and health insurance. Summer semester assistantships include payment of up to 5 credits of tuition. The award of an assistantship for a full academic year includes exemption from out-of-state tuition for the summer semester following or preceding the academic year, and payment of health insurance for the summer following the academic year appointment.

The stipend level is set each year for graduate assistants. A graduate student typically starts out at Level 1 and will be moved to Level 2 at the end of two semesters of appointment. Appointments to Level 3 must be made after 6 semesters (including summers) of teaching experience, and to those with an MS or the equivalent, and Ph.D. students who already hold an M.S. degree may also begin at Level 3. Stipends are not subject to Social Security taxes but are generally subject to income taxes. Graduate Assistants are also eligible for additional parking privileges. A copy of the signed appointment form must be presented to the Vehicle Office when registering the motor vehicle.

Health insurance information for graduate assistants is provided by MSU Human Resources. Details can be found at <https://www.hr.msu.edu/benefits/graduate-assistants/health/index.html>. Coverage is provided at no cost for the graduate assistant only. Graduate assistants have the option of purchasing coverage for their spouse, same-sex domestic partner, and/or dependents.

### **12.4 Assistantship Eligibility**

Award of assistantships is usually most strongly influenced by the perceived ability of the student to perform the job involved.

University policy states that assistantships are available only to graduate students who maintain at least a 3.0 grade point average. By School policy, a graduate student whose GPA falls below 3.0 for two consecutive semesters will be dismissed from the program, and consequently will be ineligible for an assistantship.

As discussed in Section 12.1, teaching assistants are required by the University to have acceptable English language skills.

Note: Assistantships are not generally available to newly entering international graduate students, especially at the MS level.

### **12.5 Duties and Enrollment Requirements**

Assistantships carry a work requirement that depends on the level of appointment, and also require certain minimum and maximum credit loads. In most cases, the stated workload is an average. Students are expected to be willing to work more than the hourly average when needed, compensated by working less hours when the need is less. The term of appointment, and thus the work expectation, extends beyond the semester class dates.

Quarter-time assistantship appointments require 10 hours of work per week and require a minimum enrollment of 6 credits for master's degree students and 3 credits for doctoral students (including credits in 899 or 999 courses); maximum enrollment is 16 credits (excluding any credits in 899 or 999 courses). For summer semester, the minimum registration is 3 credits.

Half-time assistantships require 20 hours of work per week and a minimum enrollment of 6 credits for master's degree students and 3 credits for doctoral students (including 899 or 999 courses); maximum enrollment is 12 credits (excluding 899 or 999 courses). For summer semester, the minimum registration is 3 credits.

Deviation from the minimum enrollment requirements listed above is permitted only during:

1. Summer session, when a 3-credit minimum enrollment is allowed for all types of assistants with 1-credit minimum for doctoral students successfully completing all comprehensive exams.
2. The semester in which the degree is granted, when all types of assistants must enroll for at least the number of credits required to complete the degree or meet the university minimum registration requirement.

Any deviation from the maximum enrollment requirements listed above must have the approval of the dean of the college *prior to enrollment*. The minimum enrollment is reduced to 1 credit for Ph.D. students who have completed the comprehensive examination requirement and are engaged in dissertation research.

Courses taken as a visitor DO NOT COUNT towards minimum enrollment requirements and are not covered by the assistantship tuition benefits.

All TAs and RAs must complete the on-line Relationship Violence and Sexual Misconduct Policy training. To access the training, login to the ORA training website at: <http://ora.msu.edu/train> Click "Register," "Complete Registration," and then "Launch" to begin the Relationship Violence and Sexual Misconduct (RVSM) Policy - Faculty, Staff Training. (If it indicates that you have already registered, use "In Progress Training", then "Launch."). You will want to reserve approximately 30 minutes to complete all assignments. If you need assistance, contact the Helpdesk at 517-884-4600 or [train@ora.msu.edu](mailto:train@ora.msu.edu).

## **12.6 Reappointment**

The terms of an assistantship will be specified at the time of the award. Reappointment is generally contingent on availability of funding as well as on satisfactory performance. By University policy, all current graduate assistants will be notified in spring semester whether they will be reappointed for the following year.

## **12.7 Termination**

The department may terminate a graduate assistantship for substandard performance, inability to perform expected duties, violation of the General Student Regulations contained in the *Spartan Life* handbook, or violation of the provisions concerning graduate student responsibilities contained in the *Graduate Student Rights and Responsibilities* document. Academic difficulty will result in a review of the student's overall situation by the department.

## **12.8 Graduate Assistant Leave Policy**

A graduate assistant unable to fulfill the duties of his/her appointment because of illness or injury shall notify the Director of the School as soon as circumstances permit. Similarly, a graduate assistant unable

to fulfill the duties of her appointment because of pregnancy shall notify the Director as soon as circumstances permit.

During the illness, injury, or pregnancy the School shall adjust (reduce, waive, or reschedule) the graduate assistant's duties as those duties and the assistant's physical circumstances reasonably dictate. If total absence from duties becomes necessary, the School shall maintain the stipend of the appointment, provided the graduate assistant is still enrolled, for a period of two months, or to the end of the appointment period or of the semester, whichever should occur first. The graduate assistant shall have the right to return to the assistantship, within the original terms of the appointment, at such time as he/she is able to reassume the duties of the position.

Assistantship duties apply during the whole period of appointment, and are not limited to days when classes are in session. However, the work expectation is an average over the appointment period. Therefore, schedules are to be adjusted when appropriate. For example, it is expected that students will be allowed time off to attend professional meetings, when feasible. Similarly, schedules should be adjusted to permit holiday and vacation time, as appropriate. Graduate assistants should discuss such matters with their supervising faculty, making arrangements to complete their responsibilities while providing a reasonable amount of time off.

For jury duty, please refer to the GEU Collective Bargaining Agreement at <https://hr.msu.edu/contracts/documents/GEU2015-2019.pdf>

## **12.9 Outside Work for Pay**

There are no specific School of Packaging outside work for pay policies for graduate students. All students who are on graduate assistantships should discuss outside work for pay with their supervising faculty, to make sure no conflicts are created.

## **13. UNIVERSITY RESOURCES**

### **13.1 School of Packaging**

Director, Dr. Matthew Daum, 135 Packaging.....	daummatt@msu.edu
Associate Director, Dr. Laurent Matuana, 145 Packaging.....	353-4616
Graduate Director, Dr. Maria Rubino, 142 Packaging.....	355-0172
Administrative Assistant, Tracy Lorenz, 137 Packaging.....	353-4384
Graduate Secretary, Susan Barnaby, 130 Packaging.....	884-9566

### **13.2 Resources and Services for Graduate Students**

The University provides a wide array of services to students to assist them in adjusting to the rigors and inevitable stresses that go with academic life. The following is a listing of some of the available services.

#### **13.2.1 Student Services**

Michigan State University provides extensive student personnel services to assist students and enhance the educational experience. Michigan State University recognizes that the total development of the individual - personal, social, and physical, as well as intellectual - is of equal importance.

The Vice President for Student Affairs and Services has general administrative responsibility for all student personnel matters. The multiple services and responsibilities are carried out through a number of offices, as detailed at <http://www.vps.msu.edu/>.

### **13.2.2 MSU Library**

We recommend that on-campus students take advantage of the library tours in order to familiarize themselves more thoroughly with all the available resources. There are many branch libraries on campus. Consult <http://www.lib.msu.edu/> for more information. The library also has available a large number of electronic resources.

### **13.2.3 Computer Center**

The Computer Center offers a variety of services, including a computer store. Information can be found at <http://tech.msu.edu/>.

### **13.2.4 Bookstore**

The Spartan Bookstore is located in the basement of the International Center on Shaw Lane. Several off-campus bookstores are located in the East Lansing area.

### **13.2.5 Office for International Students and Scholars (OISS)**

The Office for International Students and Scholars (OISS), located in room 103 in the International Center, phone 353-1720, email: [oiss@msu.edu](mailto:oiss@msu.edu), serves international students and foreign faculty. OISS is a resource center for information and consultation on matters related to the international student and faculty/scholars. The staff is prepared to help in any of the various areas of concern, including academic problems, immigration questions, social, health, employment, or financial matters. The office also organizes seminars and workshops on topics of interest to the broad university community. These have included immigration regulations, cross-cultural communication, pre-departure programs for graduating students and various training programs. The OISS web page is <http://oiss.isp.msu.edu/>. OISS publishes a very informative welcome handbook, available at <http://oiss.isp.msu.edu/documents/resources/handbook.pdf>.

### **13.2.6 Learning Resources Center**

202 Bessey Hall 355-2363, <http://lrc.msu.edu/>

This is a self-paced, individualized learning center that offers free assistance to students who want to improve their study skills. Its goal is to help you develop the strategies and techniques you need to be a successful student. Workshops on specific study skills are offered throughout the year.

### **13.2.7 Center for Service-Learning and Civic Engagement**

345 Student Services Bldg. 353-4400, <http://www.servicelearning.msu.edu/>

This is a volunteer program that gives students the opportunity to learn more about different work environments while providing community service. Staff are available to assist students in choosing a placement that meets their interests.



### **13.2.8 MSU Writing Center**

300 Bessey Hall 432-3610, <http://writing.msu.edu/>

This center offers writing consultation to graduate as well as undergraduate students. One on one consultations are best for small papers or projects like vitas, abstracts, and cover letters, while peer response writing groups offer help developing drafts of larger projects like research and conference papers, and even theses and dissertations. The center has a library with books on resumes, vitas and cover letters, and examples of all of the above. It also operates satellite centers, including one in the MSU Library.

### **13.2.9 Career Services Network**

113 Student Services Bldg. 355-9510, <http://careernetwork.msu.edu/>

The Career Services Network office assists students in career advising and seeking employment upon graduation. Their office is located in 113 Student Services Building and can be contacted at 355-9510. Their staff does workshops, classes and individual advising on topics such as how to interview successfully and steps to creating a well-written resume. Students may also interview for internships or full-time employment through the Career Placement office

Ronald Iwaszkiewicz, the School of Packaging internship, and employment director, also offers assistance in finding internship and permanent employment. He also provides resume preparation information, and runs the School's annual Career Fair, held each January. No more than 1 six-month internship will be approved as curricular practical training for international students.

### **13.2.10 Resource Center for Persons with Disabilities**

120 Bessey Hall, 353-9642, <http://rcpd.msu.edu/>

The Center provides services for persons with disabilities to maximize their opportunity for full participation in University activities.

### **13.2.11 Counseling Center**

207 Student Services Building, 355-8270, <http://www.counseling.msu.edu/>

Students should feel free to contact the Counseling Center for personal concerns and crisis. Professional counseling and psychological services are offered to assist with personal, as well as career concerns. All services are confidential.

### **13.2.11 Counseling & Psychiatric Services (CAPS)** **([https://caps.msu.edu/general\\_info/index.html](https://caps.msu.edu/general_info/index.html))**

Student Health & Wellness Appointments (517) 355-8270

Press "1" at the prompt to speak with a crisis counselor (CAPS is providing remote crisis services 24/7/365)

Other prompt options are available for those not in crisis. CAPS Fax line: (517) 353-5582

Additionally, you can contact CAPS through our Online Contact Form to ask general questions or provide feedback about services.

### **13.2.12 Olin Health Center**

353-4660, <http://www.olin.msu.edu/>

The Student Health Service is located in Olin Health Center. There is also a clinic at Hubbard Hall open fall and spring semesters. Services are available by appointment only. In the event of a life-threatening emergency, no matter what time of day, always call 911.

### **13.2.13 MSU WorkLife Office**

479 West Circle Drive, Linton Hall, Suite 116/118, 353-1635, <https://worklife.msu.edu/>

The WorkLife Office partners with the community to create an inclusive, responsive work environment where all faculty and staff are respected and supported toward well-being in work and personal lives.

### **13.2.14 Intramural Sports Facilities**

355-5250, Intramural Sports & Recreational Services, 205 IM Sports West, <http://recsports.msu.edu/> / Students have access to equipment and facilities in the intramural facilities located in the IM-West, IM-East, and IM-Circle. Students must present a current MSU student ID in order to be admitted to these facilities and use the equipment. Use of most of the facilities is free to currently enrolled students, although there are a few exceptions, such as a small charge for the use of the weight room in the IM-East.

### **13.2.15 MSU Student Food Bank**

432-5146, <https://www.msu.edu/~foodbank/> The Student Food Bank was formed to help address the problems of students and their families with financial hardship.

### **13.2.16 MSU Safe Place**

G-55 Wilson Hall, 355-1100, <http://safeplace.msu.edu/>

MSU operates a domestic abuse center, which serves MSU students, faculty, staff, retirees or their partners, and children who are experiencing an emotionally, physically or sexually abusive relationship. All services are free and confidential.

### **13.2.17 MSU Graduate Student Career and Professional Development**

<https://grad.msu.edu/prep>

The MSU Graduate School provides a variety of programs related to the career and professional development of graduate students.

## **13.3 CIC Traveling Scholar Program**

MSU is a member of the Committee on Institutional Cooperation (CIC). Through this committee's traveling scholar program, a doctoral student can take a limited amount of course work at any Big Ten University or the University of Chicago. Participants in this program normally pay tuition at MSU and at MSU rates for courses taken at other participating institutions. A doctoral student interested in this program should contact the Office of the Graduate School (355-0300) for instructions and formal processing.

## **13.4 Health Insurance**

MSU offers a student health insurance plan. Information can be found at <https://www.hr.msu.edu/benefits/students/health/>. E-mail questions can be submitted at

[studentinsurance@hr.msu.edu](mailto:studentinsurance@hr.msu.edu). As described in the Assistantships sections, graduate assistants are provided with health insurance as part of their benefits.

### **13.5 Travel Abroad**

The MSU Travel Clinic, <http://travelclinic.msu.edu/> provides information about health risks and needed immunizations.

The [International Studies and Programs](http://oihs.isp.msu.edu/international-travelers/safety-security/) website provides information about issues related to safety around the world at <http://oihs.isp.msu.edu/international-travelers/safety-security/>. When students appointed as TAs or RAs travel outside the U.S. to conduct required thesis or dissertation research or to collaborate with investigators conducting research abroad, the department or research grant supporting the work will be required to pay for all needed vaccinations and or medications (e.g., anti-malarial) as determined by the MSU Travel Clinic. Students may include those costs in applications for funds from the Research Enhancement or Travel Grant programs administered by the Graduate School.

Graduate students presenting results of their research at professional conferences abroad can apply for assistance with travel funding via the Graduate School. The application form is available at <https://grad.msu.edu/travel> . (Students can also apply for funding for domestic travel.)

Graduate students traveling internationally for MSU-related work (research data collection, international professional conferences, courses, or other academic business) **must** see Tracy Lorenz, Assistant to the Director, who will direct the student in completing the Pre-Trip Authorization form and will input the student into the International Travelers Database (even if they are not being reimbursed for travel). This is the best way for MSU to stay in touch with our students if there is an emergency.

### **13.6 Transportation**

#### **13.6.1 Parking on Campus**

Any vehicle a student brings on campus must be registered through the Parking Division of the MSU Police office, <http://www.dpps.msu.edu/>. To obtain a parking permit the applicant must present his/her vehicle registration, student ID, and driver's license. Graduate assistants must present a copy of their appointment document. On-line vehicle registration for graduate assistants is now available and encouraged, through the DPS website listed above.

Fellowship recipients who receive an MSU Fellowship of \$1,000 or more per semester qualify for a graduate assistant parking permit. Application must be made in person at the Parking Office and proof of the MSU fellowship must be submitted.

A student who does not have a graduate assistantship or fellowship may, under special circumstances, qualify for special parking privileges. For example, if a vehicle is necessary in performing the duties for a job a student holds on campus, the student may be eligible for a special parking permit.

#### **13.6.2 Buses**

Buses operated by CATA serve all parts of the campus and connect with CATA routes serving the Lansing and East Lansing area.

#### **13.6.3 Bikes**

The University maintains bicycle racks throughout the campus. Bikes should be locked to these racks when parked. Bikes are not permitted in campus buildings. Improperly parked bikes are subject to impoundment by the Department of Public Safety. Bicycle registration through the MSU Department of Public Safety or the cities of East Lansing or Lansing is required. Bicycle registration from the Department of Public Safety is free, and can be obtained on-line, through the link at: <http://police.msu.edu/management-services-bureau/parking-office/bicycle-information/>. Bicycle registration from the city of East Lansing is also free, and may be obtained at the East Lansing Police Dept. Bicycles can be rented from and serviced by MSU Bikes! located behind Bessey Hall.

## **13.7 Organizations**

### **13.7.1 Council of Graduate Students (COGS)**

316 Student Services, 353-9189, <http://cogs.msu.edu/>

COGS is the official graduate student organization at Michigan State University. Officers and departmental representatives (one representative per department for the entire University) are voting members. The primary objective is improvement of the academic, social, and economic position of graduate students at MSU. The organization has official delegates to the Graduate Council, the Academic Council and its standing committees, and several all-university and presidential committees. Through membership in these and other bodies, COGS participates in decisions on such matters as tuition and fees, the grading system, traffic regulations, academic and extracurricular programs of the university, graduate assistant stipends, improvements in on and off campus student living conditions, student rights and responsibilities, student representation in university government, and the selection of principal administrative officers. Meetings are open to all graduate students. COGS offers a variety of services to MSU graduate and professional students, including copy services and short-term loans. The Packaging Graduate Association can provide the name of the School's current COGS representative.

## **13.8 Publications**

### **13.8.1 Graduate School Publications**

<http://grad.msu.edu>

The Graduate School puts out a number of documents that provide useful information for graduate students.

### **13.8.2 Academic Programs Catalog**

<http://www.reg.msu.edu/AcademicPrograms/>

This is the primary source for university regulations, policies, procedures, and academic program requirements.

### **13.8.3 Spartan Life On-line**

<http://splife.studentlife.msu.edu/>

This is produced by the Division of Student Affairs and Services.

### **13.8.4 Schedule of Courses**

<http://schedule.msu.edu/>

Provides course schedule information.

### **13.8.5 Graduate School Thesis and Dissertation Electronic Submissions Guide**

This guide can be found through the link at <http://grad.msu.edu/etd/>.

A tutorial is also available.

### **13.8.6 The State News**

An independent student-run newspaper that contains news and a listing of events of interest.

### **13.8.7 Graduate Student Rights and Responsibilities**

This document is available at <http://grad.msu.edu/gsrr/>, and contains University policies concerning graduate education.

## APPENDIX 1

### Titles and Descriptions of Packaging Courses

For full course characteristics, prerequisites, and restrictions go to the [Office of the Registrar – Course Descriptions](#)

- PKG 101 Principles of Packaging. 3(3-0). **fall, spring, summer**. Packaging systems, materials and forms and their relationship to the needs and wants of society.
- PKG 102 Introductory Packaging Seminar. 2 (2-0). **fall, spring**. Packaging career choices in science, management and engineering. Creativity in packaging designs and career decisions.
- PKG 221 Packaging with Glass and Metal 2(2-0) Prerequisite: (CEM 141 or CEM 151 or LB 171) and (PHY 231 or PHY 231C or PHY 183 or PHY 183B or LB 273) and (PKG 102 or concurrently). **fall, spring**. Physical and chemical properties of glass and metals and their applications to packaging.
- PKG 315 Packaging Decision Systems. 3(2-2) Prerequisite: (MTH 132 or MTH 152H or LB 118) and (PKG 221 or concurrently). **fall, spring**. Communication, analysis, and problem solving in the management, specification, production, sustainability, economics and testing of packaging.
- PKG 322 Packaging with Paper and Paperboard. 4(3-2) Prerequisite: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119 or MTH 124) and (CEM 143 or CEM 251 or CEM 351) and (STT 200 or STT 201 or STT 315 or STT 351). **fall, spring**. Physical and chemical properties, manufacture, conversion, and use of wood, paper, paperboard, and related components in packaging. Design, use, and evaluation of packages.
- PKG 323 Packaging with Plastics. 4(3-2) Prerequisite: ((PKG 221 or concurrently) and PKG 101) and (MTH 133 or MTH 153H or LB 119 or MTH 124) and (STT 200 or STT 201 or STT 315 or STT 351) and (CEM 143 or CEM 251 or CEM 351). **fall, spring**. Physical and chemical properties of plastics and their relationship to selection, design, manufacture, performance, and evaluation of packages.
- PKG 410 Distribution Packaging Dynamics. 4(3-2) Prerequisite: PKG 322 and PKG 323. **fall, spring**. Identification and measurement of hazards in physical distribution. Methods of protection against climate, shock, vibration, and compression.
- PKG 411 Packaging Development Technology. 3(2-2). Prerequisite: (PKG 322 and PKG 323) and ((PKG 315 or concurrently) or EGR 102). **fall, spring**. Development of consumer packaging utilizing current technology tools. Integration of package structure, graphics and performance. Examination and application of current practices in packaging development.
- PKG 421 Virtual Design and Prototyping. 3(202). Prerequisite: PKG 411. Using technology resources to design and integrate packaging structure and graphics. Use of design thinking for package development. Virtual and physical prototyping. Emphasis on packaging for specialized markets.
- PKG 430 Packaging for Fast-Moving Consumer Goods (FMCG). 3(3-0) Prerequisite: PKG 315 and PKG 322 and PKG 323. **Fall**. Package graphics and structure in fast-moving consumer

goods packaging and marketing. Consumer experience, printing and decoration. Preparation, production, and economics of packaging graphics.

- PKG 432 Packaging Processes. 4(3-2) Prerequisite: (PKG 322 and PKG 323) and (PHY 232 or PHY 232C or PHY 184 or PHY 184B or PHY 294H or LB 274). **fall, spring**. Integrated study of packaging and production operations, quality control, and organization and control of machines. Interrelationship of products, packaging, machinery layout and efficiency, and quality issues.
- PKG 452 Medical Packaging. 4(3-2) Prerequisite: PKG 322 or 323. **fall**. Special requirements for packaging pharmaceuticals and medical devices. Evaluation of package systems and packaging procedures.
- PKG 456 Packaging and Shelf Life of Perishable Food. 3(3). Fall. Prerequisite: PKG 322 and PKG 323. Chemical, physical and microbiological changes that affect quality of produce, meat, and seafood, and their relationship to packaging and distribution (cold chain). Packaging and other preservation technologies to extend shelf life of perishable food.
- PKG 455 PKG 455 Food Packaging. 4(3-2) Prerequisite: PKG 322 and 323. Spring. Food package systems related to specific products and processes. Product composition, deterioration, safety, and packaging solutions. Shelf-life estimation of packaged food.
- PKG 465 Packaging Value Chain. 3(3-0) Prerequisite: PKG 322 and PKG 323 and PKG 432. **fall and summer of every year**. Integrated identification and measurement of packaging supply chain components, from material extraction through processing, shipping, warehousing, sales and disposal. Integration of information technologies. Application and interrelationship of costs and financial aspects to the decision-making processes.
- PKG 470 Packaging Sustainability. 3(3-0) Prerequisite: Completion of Tier 1 writing requirement. Recommended background: CEM 141 or CEM 151 or LB 171. **spring**. Effects of packaging on environmental quality. Solid waste. Air and water quality. Laws, economics and energy. Resource use and conservation.
- PKG 477 Hazardous Materials Packaging. 3(3-0) Recommended Background: PKG 322 and PKG 323. **summer**. Packaging hazardous materials. Title 49 of the U.S. Code of Federal Regulations. Product classes, use of regulations, exceptions, authorized packaging, and the performance testing program.
- PKG 485 Packaging Development. 4(4-0) Prerequisite: (PKG 410 and PKG 432) and (PKG 315 or EGR 102) and (PKG 411 or concurrently). **fall, spring**. Package development including selection, design and implementation of package systems for protection, distribution, merchandising, use and disposal.
- PKG 490 Directed Studies in Packaging. 1-3 Credits. Prerequisite: PKG 322 and 323. **fall, spring, summer**. Development of solutions to specific packaging problems. Supervised individual study. Maximum of 6 credits in all enrollments for this course.
- PKG 491 Special Topics. 1-4 Credits. Prerequisite: None. **fall, spring, summer**. Selected topics of current interest. Maximum of 8 credits in all enrollments for this course.

- PKG 493 Professional Internship in Packaging. 3 Credits. Prerequisite: (PKG 322 and PKG 323) and (PKG 315 or EGR 102). **fall, spring, summer**. Supervised professional experience in the field of packaging offered through corporations and other businesses throughout the U.S. Maximum of 6 credits in all enrollments for this course.
- PKG 499 Undergraduate Research. 1-3 Credits. Fall, spring, summer. A student may earn a maximum of 6 credits in all enrollments for this course. Restrictions: Open to undergraduate students in the Packaging Major. Approval of school. Undergraduate research project designed to enhance critical thinking, problem-solving, teamwork, and communication skills.
- PKG 801 Packaging Materials 4(4-0) Restrictions: Approval of Department. **fall**. Physical and chemical properties of packaging materials; design, manufacture, performance and evaluation of packages. Restrictions: Approval of department. *Not applicable to 30 required MS credits for Packaging graduate students.*
- PKG 803 Packaging Distribution and Dynamics 2(2-0) Restrictions: Approval of Department. **spring**. Transportation environment, distribution packaging design and testing. *Not applicable to 30 required MS credits for Packaging graduate students.*
- PKG 804 Packaging Processes 2(2-0) Restrictions: Approval of Department. **spring**. Integrated study of packaging and production operations, quality control, organization and control of machines. Interrelationship of products, packaging, machinery layout and efficiency, and quality issues. *Not applicable to 30 required MS credits for Packaging graduate students.*
- PKG 805 Advanced Packaging Dynamics. 3(2-2) Recommended Background: PKG 410. **spring**. Shock and vibration. Distribution hazards and product fragility. Cushion performance and package design. Environmental measurement and simulation.
- PKG/VM 814 Packaging for Food Safety. 3(0-0) Restrictions: Open to MS students in Food Safety major or graduate students in Packaging or approval of college. Interdepartmental with Veterinary Medicine. **summer**. Current issues in packaging and food safety.
- PKG 815 Permeability and Shelf Life. 3(2-2) Recommended Background: MTH 132 and PKG 322 and PKG 323. **spring**. Relationship between the storage life of packaged food and pharmaceutical products and the gas, moisture, and organic vapor permeability of packages in various environments.
- PKG 817 Instruments for Analysis of Packaging Materials. 4(3-2) Prerequisite: PKG 322 and 323. **fall of even-numbered years**. Analytical methods for packaging including spectrophotometry and chromatography. Material identification and characterization. Migration and permeation measurements.
- PKG 825 Polymeric Packaging Materials. 4 (3-2). Recommended Background: Graduate students with chemistry, physics, and mathematics backgrounds. **fall**. Physical, mechanical and chemical properties of packaging polymers and multilayer structures; relationship between properties and performance of packaging materials and systems; processing of packaging plastics.



- PKG 850 Packaging Value Chain. 3(3-0). **fall**. Packaging value chain from raw material supplier to retailers in context of meeting current needs. Global exploration of value chain strategies to increase innovation, sustainability, cost savings, quality, organizational agility, responsiveness.
- PKG 860 Research Methods. 3(3-0). **fall**. Principles and expectations for responsible conduct of research in packaging. Integrity of the research process, critical thinking, scientific methods, proposal writing, and scientific communications.
- PKG 875 Stability and Recyclability of Packaging Materials. 3(3-0) Recommended Background: PKG 322 and PKG 323. **fall of odd-numbered years**. Interactions between packaging materials and their environments: corrosion, degradation, stabilization, and recycling. Impacts of packaging disposal.
- PKG 888 Master's Project. 2. Fall, Spring, Summer. Open only to master's students in the School of Packaging. Approval of school, application required. Master's degree Plan B project. Completion of a project related to packaging issues
- PKG 890 Independent Study in Packaging. 1-3 Credits. Restrictions: Open only to Graduate students in School of Packaging. Approval of department; application required. **fall, spring, summer**. Special investigations of unique packaging problems. Maximum of 4 credits in all enrollments.
- PKG 891 Selected Topics. 1-4 Credits. Restrictions: Graduate students in School of Packaging. **fall, spring, summer**. Selected topics of interest to graduate packaging students. Maximum of 8 credits in all enrollments.
- PKG 899 Master's Thesis Research. 1-8 Credits. Restrictions: Masters students in School of Packaging. **fall, spring, summer**. Maximum of 99 credits in all enrollments. Master's thesis research.
- PKG 985 Analytical Solutions to Packaging Design. 3(3-0) Recommended background: PKG 801. Restrictions: Open to Graduate students in CANR or Engineering or Natural Science. Approval of department; application required. **spring of even-numbered years**. Analytical and quantitative techniques for packaging design and evaluation.
- PKG 990 Independent Study in Packaging. 1-3 Credits. Restrictions: Open only to Ph.D. students in the School of Packaging. Approval of department; application required. **fall, spring, summer**. Maximum of 6 credits in all enrollments. Special investigations of unique packaging problems
- PKG 999 Doctoral Dissertation Research. 1 to 24 credits. Restrictions: Open to Doctoral students in School of Packaging. **fall, spring, summer**.

## APPENDIX 2

### School of Packaging Faculty and Graduate Research Areas

#### **Dr. Eva Almenar, Associate Professor** (<https://www.canr.msu.edu/almenar/index> )

- Handling and packaging of whole and fresh-cut products in the global market
- Extension of the shelf life of food products: Active and Passive Modified Atmosphere Packaging (AMAP and PMAP), Controlled Atmosphere Packaging (CAP), Active Packaging (AP), and edible films
- Food/Package/Environment Interaction : Physiochemical, microbiological and sensorial changes. Relation between produce respiration, temperature, and package permeability (microperforated and continuous films)
- Food safety
- Permeation of gases, water vapor and volatile organic compounds
- Development of new polymers made from natural resources with a focus on agrowaste and their commercial applications
- Development of new packaging systems
- Evaluation of consumer and industry attitudes toward packaged food and packaging formats
- E-commerce food packaging

#### **Dr. Rafael Auras, Professor**

- Food product/package compatibility and interaction
- Mass transfer in polymers
- Permeability, diffusion, solubility and migration
- Material applications in packaging
- Biodegradable polymers
- Polylactide and starch polymers
- Biodegradable packaging
- Packaging sustainability

#### **Dr. Laura Bix, Professor**

- Human Factors with a particular emphasis on elderly and disabled
- Label Designs that improve the likelihood that consumers will:
  - Notice label information
  - Physically decipher label information
  - Understand label information
  - Comply with the information provided
- Closure Designs
- Subjects with diminished dexterity
- Child resistance
- Improving patient compliance through package design

**Dr. Euihark Lee, Assistant Professor**

- Packaging Evaluation using Machine Learning
- Data Mining for packaging
- Packaging structural analysis and optimization including mathematical modeling, finite element analysis
- Kirigami cushioning design for the e-commerce packaging applications
- Distribution simulation for the e-commerce packaging
- A hybrid distribution testing method using both computer simulation and physical testing

**Dr. Amin Joodaky, Assistant Professor**

- Packaging Dynamics
  - Characterizing and modeling mechanical properties and dynamic responses of packaging structures such as polymer foams
  - Capturing and lab-reproducing six-degree-of-freedom (6DOF) vibrations of packages and vehicles during transportation.
  - Designing metamaterials for shock absorption in packaging
- Mechanics of composite structures
- Nonlinear dynamics and vibrations

**Dr. Pascal Kamdem, Professor**

- Biological-Chemical-physical-Mechanical properties of Packaging made of renewable-disposable-reusable-recyclable-biodegradable carbon sequestering lignocellulosic biomass materials such as wood, wood and natural fibers
- Technology to reduce cost and improve service life of lignocelluloses based Packaging materials against biological, chemical and physical degradation using innovative technology
- Value added products from nature ecosystem to support nature and forest ecosystem management

**Dr. Monireh Mahmoudi, Assistant Professor**

- Application of operations research methods in logistics and operations planning of packaging,
- Development of rich and generalized packaging routing system with real-world packaging constraints,
- Uncertainty management in the packaging routing value chain,
- Waste value chain in packaging.

**Dr. Laurent Matuana, Professor**

- Development of Natural Fibers-based Packaging Biocomposites/Biomaterials
- Microcellular and Conventional Foaming of Biocomposites/Biomaterials
- Nano-technologies Applied to Packaging Biocomposites/Biomaterials

**Dr. Mohammad Mohiuddin, Assistant professor**

- Processing and Characterization of bio-nanocomposites, nanomaterials, and their applications in food processing and packaging
- Solid mechanics and Polymer composites
- Carbon Nanotube (CNT) based thermoplastics for development of pressure and temperature sensors, composite materials, and computational solid mechanics.

**Muhammad Rabnawaz, Assistant Professor**

- Development of plastics from novel starting materials
- Our group work on the development of innovative materials for packaging applications. Active research areas include sustainable polymers from renewable materials, polymer composites, and high barrier coatings. For more details visit our group page:  
<http://www.canr.msu.edu/rabnawaz/>

**Dr. Maria Rubino, Professor**

- Packaging development
- Quality design of packaging systems
- Conversion of packaging material
- Laws and regulations
- Packaging permeability and shelf life
- Compatibility of package with food and chemicals

## **APPENDIX 3**

### **Outlines for Undergraduate Core Courses**

#### **PKG 221, GLASS AND METAL PACKAGING, 2(2-0)**

Prerequisite: PKG 101 or concurrent; CEM 141, PHY 231, MTH 124

1. Glass, Definition, Composition, Raw materials, Additives, Other types of glass, Borosilicate, Lead, USP categories, Leaching
2. Glassmaking, Furnace, Melter, Regenerator, Refiner, Forehearth, Container manufacture, Press and blow, Blow and blow, Centrifugal casting, Ribbon machine, Drawn ware, Annealing, Coating, Nomenclature, Strength/Performance, Brittle failure, Internal pressure, Impact, Top load, Hydrodynamic failure, Thermal shock, Stress concentration, Defects, Specifications, Labeling, Economics, Specifications
3. Closures, Types, Screw, lug, friction, roll-on, snap-on, Child-resistant, Torque, Application, Removal, Liners, Linerless, Fitments, Dispensing closures, Tamper evidence
4. Metals, Packaging metals (steel, stainless, aluminum, tinplate), Manufacturing (availability, economics), Metal properties and users, Cans, Three-piece can, Two-piece cans (DI and DRD), Composite cans, Can stresses (compression, pressurization, vacuum), Compression/ Buckling, Can specifications (AAA x BBB, base weight), Can industry, Liners, Decoration, Aerosols, Uses, Economics, Two and three phase systems, Valves and dip tubes, Principles of operation (gas law, Charles' Law, Boyle's Law), Propellants (fluorocarbons, hydrocarbons, compressed gases), Special aerosols (piston type, co-dispensing), Pumps, Metal drums and pails, Coatings, Hazardous materials regulations, Corrosion, Theory, Corrosion protection (VCI's, sacrificial materials, coatings), Metal recycling, Foils, Strapping/Banding, Tubes, Economics

#### **PKG 322, PAPER AND PAPERBOARD PACKAGING, 4(3-2)**

Prerequisite: PKG 101, STT 200, 201, or 315, PKG 221 or concurrent, CEM 143

1. Wood, Wood Classification, Nominal Dimensioning, Board Footage, Moisture Content, Psychrometer, Shrinkage/Expansion, Anisotropy, Moisture Stresses, Mechanical Properties, Pallets, wood and plastic, Pallet design/performance, Wood design principles, Nails, types and holding capacity, Crates/Boxes/Bin Pallets, Wirebound Boxes, Plywood, Particleboard, Fiberboard, Regulations
2. Paper/Paperboard, Paper Structure/Terminology, Cellophane, Paper/Paperboard Manufacturing, Fourdrinier/Cylinder Machines, Paper Specification, Machine Direction/Cross Direction, Basis Weight/Grammage, Moisture Content, Paper Labels, Optical Properties, Paper Types, Paper Standards, ASTM/TAPPI Tests, Ring Crush, Friction, Tear Strength, Tensile Tests, Porosity, Bending Stiffness, Bags, Multiwall Bags, Folding Cartons/Set-up Box, Carton Manufacture, Paper Tubes/Drums/Cans, Slip Sheets
3. Corrugated Board, Board grades, Recycling/Properties, Corrugated Board Manufacture, Flutes/Single, Double, Triple Wall, Adhesive Bond, Specifications, Coatings and WVTR, Mullen/Puncture Tests, Flat Crush/Edge Crush Tests, Rule 41/Item 222, Box Certificates, Rule 40/Rule 49, Box Layout, RSC/CSSC/FOL/FTD Box Types, Box Manufacture/Scoring Allowances, Optimization, Economy, Compression Test, McKee Formula/ECT, Inserts/Partitions, Stack Height, Pallet Patterns (Column, Interlock), Banding/Strapping/Taping, Corrugated Board Pallets, Corrugated Board Cushions

4. Printing, Processes (Screen, Flexography, Gravure, Lithography, Letterpress, Electronic, Offset), Inks, Color (Gloss, Reflectance, Opacity), Differences in Materials (Corrugated, Metal Cans, Glass, Plastics), Problems (smear, graininess, registry), Equipment Needs, Coatings, Substrates and Surface Treatments, Surface Energy and Contact Angle, Artwork Forms

### **PKG 323, PLASTICS PACKAGING, 4(3-1)**

Prerequisite: PKG 101; PKG 221 or conc.; CEM 143; PHY 232; STT 200, 201 or 315

1. Brief history of plastics, Definition of polymer, plastic, Macromolecules, constitutional units, monomers, Thermoplastic, thermoset, Major polymers, engineering plastics, Market shares and trends, costs, Interatomic and intermolecular forces, Cohesive energy density
2. Polymer structure, Polymerization process, Degree of polymerization, Oligomer, Homopolymer, Copolymers, Random, alternating, block, graft, Molecular architecture, Linear, branched, cross-link, Thermoplastic, Thermoset, Polymerization, Addition polymers, Step polymerization, Condensation polymers, Molecular weight, Averages (Number, weight, viscosity, Z), Distribution, Dispersion index, Effects on properties, Morphology, Amorphous, Crystalline, Semi-crystalline, Orientation, Effects on properties, Mechanical properties, Viscoelastic behavior, Viscosity, Elasticity, /Elastomers, Light, Transparency, IR spectrophotometry, Thermal properties, Glass transition temperature, Melt temperature, Time/temperature superposition, Effect of temperature on viscosity, Melt flow index
3. Major polymers in packaging, Polyethylene (HDPE, LDPE, LLDPE, Others), Polypropylene (Homopolymer, copolymer, OPP), Polystyrene, Polyvinyl chloride, Polyethylene terephthalate, PETG, Polyvinylidene chloride, Polyvinyl acetate, Polyvinyl alcohol, Ethylene vinyl alcohol, PEN, Nylon, Polycarbonate, Polytetrafluoroethylene, Polyacrylonitrile, Cellophane and cellulose, Additives
4. Polymer film and sheet, Extrusion, Cast film, Blown film, Lamination, Coextrusion, Coating, Metallization and silica deposition, Yield, Stretch and shrink film, Flexible Packaging, Bags, pouches, Bag-in-box, Retort pouch, Heat sealing, Methods, Evaluation
5. Permeability and shelf life, Basic concepts of mass transfer, Mechanism of permeation, Sorption, diffusion, Permeability, GTR, WVTR, Factors affecting permeability, Permeability measurements, Gas chromatograph, Water vapor transmission, Desiccants, Humidity chamber, Shelf life, Moisture sorption isotherm, Simple calculations, Multilayer structures, Cycling conditions, Computer models, calculations, predictions
6. Thermoforming, Basic concepts, Skin, shrink, blister, Plug assist, billow, vacuum snap-back, matched mold, Types of molds, Scrapless, twin-sheet, spin-welding, Thermoforming of foams, Pallets/bulk containers
7. Adhesion and adhesives, Adhesive bond strength, Cohesive bond strength, Packaging adhesives, Natural, Synthetic, Waterborne, Solvent-borne, Hot melt, Solvent emissions, Adhesion testing
8. Injection molding, Injection blow molding, Extrusion blow molding, Continuous, Intermittent, Die shaping, Programmed parison, Stretch blow molding, Coextrusion blow molding,

- Plastic/composite tubes, Coinjection blow molding, Aseptic blow molding, In-mold labeling, Drums, Rotational molding, Design features
9. Surface treatment, Corona treatment, Flame treatment, Fluorination, Sulfonation, Silica deposition, Printing
  10. Packaging foams (PS, PE, PP, polyurethane, etc.), Characteristics, Open cell, Closed cell, Forming processes
  11. Environmental aspects of plastics

#### **PKG 410, DISTRIBUTION PACKAGING DYNAMICS, 4(3-2)**

Prerequisite: PKG 322, 323

1. Hazards (compression, drops, transportation, temperature, static electricity): how to measure, simulate, and protect against, Package performance testing (compression, shock, vibration, climate), Test methods (ASTM, ISTA, ISO, NMFC Rule 180), International Perspective
2. Compression, Compression testing, Package compression strength, Warehouse/transportation factors, Stack height calculations, Clamp truck damage
3. Shock, Typical shock damage, Measure of shock fragility (G forces), Accelerometers/shock indicators, Environmental data recorders, Handling statistics (drop heights, carriers), Shock pulse analysis (drop height, G, duration, filtering), Drop test machines (shock table, incline tester, cushion tester), Pallet marshalling, railcar coupling, horizontal impact tester, spring/mass model of product on cushion, Shock transmission, Damage boundary curve
4. Cushions (materials, manufacture, solid vs loose fill, foam-in-place), Cushion properties (open vs closed cell, relation to ideal spring), Cushion curves and design, Corrugated as a cushioning material, Economics of design (packaging costs vs product damage)
5. Vibration, Transportation environment, Typical vibration damage, Abrasion, Natural frequency (spring/mass model), Vibration magnification and resonance, Vibration measuring and testing (sine sweep vs random), Road profiles and random vibration testing, Replication/simulation, PSD plots and RV controllers, Geometric stability of unitized loads (banding, stretch wrap, friction)
6. Performance Testing, Prototype packages, ASTM D 4169, ISTA certification, Damage reproduction, Hazardous materials regulations, Commercial/Federal test specifications
7. Climatic Effects (Temperature, pressure, static electricity), U.S. climate data, Temperatures inside trailers (heat transfer by conduction, convection, radiation), Insulating packages (R value, heat capacity, ice requirements), Altitude effects (pressure change), ESD and vibration (triboelectric effect), ESD protective materials, Faraday cage principle

#### **PKG 432, PACKAGING PROCESSES, 4(3-2)**

Prerequisite: PKG 322, PKG 323

1. Quality topics, Inspection of attributes, Modern concepts of TQM and manufacturing management, Statistical Process Control

2. Materials and components used in machines, Metals and other materials, Work and power, linear and rotational, Machine drives and power systems
3. Specification development and management, Inventory management
4. Operating principles of specific types of machines, Palletizers and de-palletizers, Uncasing machines, Bottle unscramblers, Container cleaning, Air blast, Ionized air blast, Water rinse, Wash and rinse, Aggressive wash and rinse, Sterilization, Liquid filling, Volume filling equipment, Weight filling equipment, Level filling, Hot filling (subsequent cooling requirement), Influence of container types/materials, Unscrambling caps and lids, Capping and liding, Chuck machines, Rotating disk machines, Difficulties and considerations with some fitments, Steam process for vacuum packaging, Cartoning, Induction welded inner seal, Induction heating process, Seal construction, Operational considerations, Shrink band application, Bottle neck bands, Large diameter tub bands, Dry product filling, Auger fillers, Baggers, Bag closing, Net weight filling, Gross weight filling, Scales, One and two stage filling applications, Accuracy, Economic implications, Product damage, Labeling, Pre-cut labels, Adhesives, Pressure sensitive, Roll labels, Pharmaceutical applications, Imprinting, Mechanical, Ink jet, Laser, Information, Programming, automation approaches, Vision systems, check weighers, metal detectors, and other sensors, PLC's and other control systems, Case packers, High speed, WAPC, Automatic vs. semi-automatic, Case erector, Form-fill-seal equipment, Horizontal, Vertical, Friction, ESD, High speed plastic pouches, Stand up pouches, Thermo-form-fill-seal equipment, Machine sections, Influence of material, Polypropylene, Robots, Operating components, Actuator systems, Conveyors, Horizontal and elevating, Materials, Surface lubrication (line lube), Accumulators, Operating speeds, Bar code readers
5. Line organization and operation, Line layout, Increasing downstream capacity, Efficiency of an individual machine, Efficiency of a set of independent machines, Efficiency of a set of machines which are not independent, Accumulator operation, Effect of accumulators online efficiency
6. Costs, Effect of production rate (efficiency, reliability, etc.)



## APPENDIX 4

### Guidelines for Integrity in Research and Creative Activities

#### GUIDELINES FOR INTEGRITY IN RESEARCH AND CREATIVE ACTIVITIES

The conduct of research and creative activities by faculty, staff, and students is central to the mission of Michigan State University<sup>6</sup> and is an institutional priority. Faculty, staff, and students work in a rich and competitive environment for the common purpose of learning, creating new knowledge, and disseminating information and ideas for the benefit of their peers and the general public. The stature and reputation of MSU as a research university are based on the commitment of its faculty, staff, and students to excellence in scholarly and creative activities and to the highest standards of professional integrity. As a partner in scholarly endeavors, MSU is committed to creating an environment that promotes ethical conduct and integrity in research and creative activities.

Innovative ideas and advances in research and creative activities have the potential to generate professional and public recognition and, in some instances, commercial interest and financial gain. In rare cases, such benefits may become motivating factors to violate professional ethics. Pressures to publish, to obtain research grants, or to complete academic requirements may also lead to an erosion of professional integrity.

Breaches in professional ethics range from questionable research practices to misconduct.<sup>7</sup> The primary responsibility for adhering to professional standards lies with the individual scholar. It is, however, also the responsibility of advisors and of the disciplinary community at large. Passive acceptance of improper practices lowers inhibitions to violate professional ethics.

Integrity in research and creative activities is based not only on sound disciplinary practice but also on a commitment to basic personal values such as fairness, equity, honesty, and respect. These guidelines are intended to promote high professional standards by everyone—faculty, staff, and students alike.

#### KEY PRINCIPLES

Integrity in research and creative activities embodies a range of practices that includes:

- Honesty in proposing, performing, and reporting research
- Recognition of prior work
- Confidentiality in peer review
- Disclosure of potential conflicts of interest
- Compliance with institutional and sponsor requirements
- Protection of human subjects and humane care of animals in the conduct of research
- Collegiality in scholarly interactions and sharing of resources
- Adherence to fair and open relationships between senior scholars and their coworkers

Honesty in proposing, performing, and reporting research. The foundation underlying all research is uncompromising honesty in presenting one's own ideas in research proposals, in performing one's research, and in reporting one's data. Detailed and accurate records of primary data must be kept as unalterable documentation of one's research and must be available for scrutiny and critique. It is expected that researchers will always be truthful and explicit in disclosing what was done, how it was done, and what results were obtained. To this end, research aims, methods, and outcomes must be described in sufficient detail such that others can judge the quality

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<sup>6</sup>Michigan State University "Mission Statement" approved by the Board of Trustees on June 24-25, 1982, (<http://www.msu.edu/unit/provost/resources/mission.html>)

<sup>7</sup>MSU Faculty Handbook, Chapter VI, "Research and Creative Endeavor—Procedures Concerning Allegations of Misconduct in Research and Creative Activities" (<http://www.hr.msu.edu/HRsite/Documents/Faculty/Handbooks/Faculty/ResearchCreativeEndeavor/vi-miscon-toc.htm>)

of what is reported and can reproduce the data. Results from valid observations and tests that run counter to expectations must be reported along with supportive data.

Recognition of prior work. Research proposals, original research, and creative endeavors often build on one's own work and also on the work of others. Both published and unpublished work must always be properly credited. Reporting the work of others as if it were one's own is plagiarism. Graduate advisors and members of guidance committees have a unique role in guiding the independent research and creative activities of students. Information learned through private discussions or committee meetings should be respected as proprietary and accorded the same protection granted to information obtained in any peer-review process.

Confidentiality in peer review. Critical and impartial review by respected disciplinary peers is the foundation for important decisions in the evaluation of internal and external funding requests, allocation of resources, publication of research results, granting of awards, and in other scholarly decisions. The peer-review process involves the sharing of information for scholarly assessment on behalf of the larger disciplinary community. The integrity of this process depends on confidentiality until the information is released to the public. Therefore, the contents of research proposals, of manuscripts submitted for publication, and of other scholarly documents under review should be considered privileged information not to be shared with others, including students and staff, without explicit permission by the authority requesting the review. Ideas and results learned through the peer-review process should not be made use of prior to their presentation in a public forum or their release through publication.

Disclosure of potential conflicts of interest. There is real or perceived conflict of interest when a researcher has material or personal interest that could compromise the integrity of the scholarship. It is, therefore, imperative that potential conflicts of interest be considered and acted upon appropriately by the researcher. Some federal sponsors require the University to implement formal conflict of interest policies. It is the responsibility of all researchers to be aware of and comply with such requirements.

Compliance with institutional and sponsor requirements. Investigators are granted broad freedoms in making decisions concerning their research. These decisions are, however, still guided, and in some cases limited, by the laws, regulations, and procedures that have been established by the University and sponsors of research to protect the integrity of the research process and the uses of the information developed for the common good. Although the legal agreement underlying the funding of a sponsored project is a matter between the sponsor and the University, the primary responsibility for management of a sponsored project rests with the principal investigator and his or her academic unit.

Protection of human subjects and humane care of animals in the conduct of research. Research techniques should not violate established professional ethics or federal and state requirements pertaining to the health, safety, privacy, and protection of human beings, or to the welfare of animal subjects. Whereas it is the responsibility of faculty to assist students and staff in complying with such requirements, it is the responsibility of all researchers to be aware of and to comply with such requirements.

Collegiality in scholarly interactions and sharing of resources. Collegiality in scholarly interactions, including open communications and sharing of resources, facilitates progress in research and creative activities for the good of the community. At the same time, it has to be understood that scholars who first report important findings are both recognized for their discovery and afforded intellectual property rights that permit discretion in the use and sharing of their discoveries and inventions. Balancing openness and protecting the intellectual property rights of individuals and the institution will always be a challenge for the community. Once the results of research or creative activities have been published or otherwise communicated to the public, scholars are expected to share materials and information on methodologies with their colleagues according to the tradition of their discipline.

Faculty advisors have a particular responsibility to respect and protect the intellectual property rights of their advisees. A clear understanding must be reached during the course of the project on who will be entitled to continue

what part of the overall research program after the advisee leaves for an independent position. Faculty advisors should also strive to protect junior scholars from abuses by others who have gained knowledge of the junior scholar's results during the mentoring process, for example, as members of guidance committees.

Adherence to fair and open relationships between senior scholars and their coworkers. The relationship between senior scholars and their coworkers should be based on mutual respect, trust, honesty, fairness in the assignment of effort and credit, open communications, and accountability. The principles that will be used to establish authorship and ordering of authors on presentations of results must be communicated early and clearly to all coworkers. These principles should be determined objectively according to the standards of the discipline, with the understanding that such standards may not be the same as those used to assign credit for contributions to intellectual property. It is the responsibility of the faculty to protect the freedom to publish results of research and creative activities. The University has affirmed the right of its scholars for first publication except for "exigencies of national defense".<sup>8</sup> It is also the responsibility of the faculty to recognize and balance their dual roles as investigators and advisors in interacting with graduate students of their group, especially when a student's efforts do not contribute directly to the completion of his or her degree requirements.

#### **Misconduct in Research and Creative Activities**

Federal<sup>9</sup> and University<sup>7</sup> policies define misconduct to include *fabrication* (making up data and recording or reporting them), *falsification* (manipulating research materials, equipment or processes, or changing or omitting data such that the research is not accurately represented in the record), and *plagiarism* (appropriation of another person's ideas, processes, results, or words without giving appropriate credit). Serious or continuing non-compliance

with government regulations pertaining to research may constitute misconduct as well. University policy also defines retaliation against whistle blowers as misconduct. Misconduct does not include honest errors or honest differences of opinion in the interpretation or judgment of data.

The University views misconduct to be the most egregious violation of standards of integrity and as grounds for disciplinary action, including the termination of employment of faculty and staff, dismissal of students, and revocation of degrees. It is the responsibility of faculty, staff, and students alike to understand the University's policy on misconduct in research and creative activities<sup>7</sup>, to report perceived acts of misconduct of which they have direct knowledge to the University Intellectual Integrity Officer, and to protect the rights and privacy of individuals making such reports in good faith.

#### **RESOURCES**

"Guidelines on Authorship", Endorsed by the University Research Council, January 15, 1998 (<http://www.msu.edu/unit/vprgs/authorshipguidelines.htm>)

"Integrity in Scientific Research: Creating an Environment that Promotes Responsible Conduct", National Academies Press, Washington, D.C., 2002, 216 pp (<http://www.nap.edu/books/0309084792/html>)

"Research Data: Management, Control, and Access Guidelines", Endorsed by the University Research Council, February 7, 2001 ([http://www.msu.edu/unit/vprgs/research\\_data.htm](http://www.msu.edu/unit/vprgs/research_data.htm))

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<sup>8</sup>MSU Faculty Handbook, Chapter VI, "Research and Creative Endeavor—Sponsored Research and Creative Endeavor" (<http://www.hr.msu.edu/HRsite/Documents/Faculty/Handbooks/Faculty/ResearchCreativeEndeavor/vi-sponsoredresearch.htm>)

<sup>9</sup> Office of Science and Technology Policy, "Notice of Final Policy", 65 CFR 76260.

## **APPENDIX 5 - SAMPLE FORMS**

1. Agreement between Major Professor and M.S. Candidate (optional)

2. Application to work in the SoP Laboratory

3. Laboratory Checkout Form

4. Graduation Checklist

**Agreement between Major Professor and M.S. Candidate**

We hereby agree to work together as student and major professor in the MS program in Packaging.

Student \_\_\_\_\_

Major Professor \_\_\_\_\_

Date \_\_\_\_\_

# Application to Work in SoP Laboratory

PrintForm



Aaron Walworth Laboratory  
 Manager School of Packaging  
 Michigan State University 448  
 Wilson Road, Rm 130  
 East Lansing, MI 48824-1223  
 Phone: 517-353-4439  
 Fax: 517-353-8999

Notes:  
 - Please print clearly and legibly.

Date:  Student Number:

Name:  E-mail Address:

Department:  MSU NetID:

Advisor's Name:  Advisor's e-mail:

Project Title:			
MSU Account Number(s)	Check Funding Type	Expiration Date	Authorized Limit
1.) <input type="checkbox"/>	Industrial <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> MSU <input type="checkbox"/>		
2.) <input type="checkbox"/>	Industrial <input type="checkbox"/> Federal <input type="checkbox"/> State <input type="checkbox"/> MSU <input type="checkbox"/>		

If keys are required for building or lab access, a deposit is required, which will be refunded upon return. Cost is \$10.00 per key, not to exceed \$20.00.

Instruments that will be used (Costs will be provided upon request):

Date applicant took EHS Chemical Hygiene and Laboratory Safety Initial training course ([aware.msu.edu/TRAIN/CHI/](http://aware.msu.edu/TRAIN/CHI/)):

Date applicant took EHS Cryogen Safety training ([aware.msu.edu/TRAIN/CRY/](http://aware.msu.edu/TRAIN/CRY/)):

Date applicant took EHS Compressed Gas Cylinder Safety course ([aware.msu.edu/TRAIN/CGC/](http://aware.msu.edu/TRAIN/CGC/)):

Date applicant took the EHS Biosafety Principles course ([oeos.msu.edu/TRAIN/BSP/](http://oeos.msu.edu/TRAIN/BSP/)):

Date applicant attended the School of Packaging Site Specific training (*schedule with lab manager*):

Date applicant reviewed MSU Chemical Hygiene Plan ([orcbs.msu.edu/chemical/programs\\_guidelines/Chem\\_hygiene/chem\\_hygiene\\_plan/chp\\_full.pdf](http://orcbs.msu.edu/chemical/programs_guidelines/Chem_hygiene/chem_hygiene_plan/chp_full.pdf)), Hazardous Waste Disposal Guide ([ehs.msu.edu/waste/programs\\_guidelines/WasteGuide/wastedisposalguide.pdf](http://ehs.msu.edu/waste/programs_guidelines/WasteGuide/wastedisposalguide.pdf)), and School of Packaging Site Specific Safety Document ([packaging.msu.edu/research/for\\_researchers](http://packaging.msu.edu/research/for_researchers)):

**Informed Consent Statement:** By signing below, the applicant acknowledges that they have been informed about the location and contents of the MSU Chemical Hygiene Plan, the School of Packaging Site Specific Safety and Standard Operating Procedures Document, MSDS sheets, and the MSU Hazardous Waste Disposal Guide. Signing also acknowledges that the applicant has taken the required safety training from EHS.

**Student Signature:**  **Date:**

**Advisor Signature:**  **Date:**

**SoP Approval:**  **Date:**

**Applicant Status (Check One):**  Staff  M.S.  Ph.D.  Undergrad  Other, please describe:

**School of Packaging**  
**Laboratory Checkout Form**

Either Part A or Part B must be completed before students will be certified for graduation.

Part A

I hereby certify that I have properly disposed of all experimental materials I have acquired or used, or that I have arranged with my major professor for them to be handled appropriately. All chemicals/materials that I have acquired and/or used have been disposed of or stored in accordance with University policies and regulations.

Name (please print): \_\_\_\_\_

Signature: \_\_\_\_\_

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

Name of Major Professor: \_\_\_\_\_

I hereby certify that the student named above has properly disposed of all his/her experimental materials or other appropriate arrangements have been made for them. All chemicals/materials that were acquired and/or used have been disposed of or stored in accordance with University policies and regulations.

Signature of major professor: \_\_\_\_\_

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

Part B

I hereby certify that no experimental materials or samples were used for my project, thesis, or dissertation.

Name (please print): \_\_\_\_\_

Signature: \_\_\_\_\_

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

Name of Major Professor: \_\_\_\_\_

I hereby certify that no experimental materials or samples were used for this student's project, thesis, or dissertation.

Signature of major professor: \_\_\_\_\_

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

## Graduation Checklist

Before leaving the University:

1. Apply for graduation at <http://reg.msu.edu/StuForms/GradApp/GradApp.asp> or in person at the Registrar's Office in the Administration Bldg.
2. Turn in an electronic copy of your thesis and any supporting data to your major professor.
3. Clean out your desk and return desk key to Room 130 Packaging. Lab keys return directly to Aaron Walworth, Lab Manager.
4. Clean up your laboratory, including research materials. Do not leave anything (reagents, materials, samples, etc.) without proper care. Discuss with your major professor who will keep the original data taken during the research. Complete the laboratory checkout form.

Additional for PhD students:

[Doctoral Students must complete the Survey of Earned Doctorates \(SED\) online.](#)

The Survey of Earned Doctorates is the definitive source of information on the nation's new research doctorates. Sponsored by the National Science Foundation and five other Federal agencies and conducted by RTI, the SED is critical to understanding in what specialty areas doctorates are produced and their post-graduation employment plans. Results are used by government as well as academic institutions to make decisions about graduate education funding, developing new programs and supporting existing ones.

The registration URL for the survey is: <https://sed-ncses.org>

Michigan State University *REQUIRES* verification of completion of the survey. When you submit your survey, a notification of completion will be automatically sent to the Michigan State University Graduate School Office. However, it is also recommended that at the end of the survey, you also have a copy of the 'certificate of completion' emailed to your own personal email for your records.

Michigan State University will verify to the NSF/RTI that students have been awarded their degree.

- o If you have any questions about the web survey, please contact RTI at [sed@rti.org](mailto:sed@rti.org) or at 1-877-256-8167.