



THE UNIVERSITY *of*
MISSISSIPPI

DEPARTMENT OF
BIOMOLECULAR SCIENCES

Divisions of Environmental Toxicology, Medicinal Chemistry,
Pharmacognosy, and Pharmacology

Graduate Student Handbook

Departmental Faculty Approval – June 21, 2021

SOP Vision

We are a highly respected community of learners, educators, scientists, and practitioners whose innovative achievements position us as leaders in improving health and wellness.

SOP Mission

The mission of the University of Mississippi School of Pharmacy is to improve health, well-being, and quality of life of individuals and communities through educating students, pharmacy practitioners and pharmaceutical scientists, conducting research, and engaging in service.

We will accomplish this by providing:

- Innovative models of practice, with an emphasis on underserved populations and those with health disparities.
- Quality education for current professional and graduate students.
- Quality post-graduate training opportunities.
- Quality continuing professional development opportunities.
- An environment that promotes the generation and dissemination of new biomedical knowledge and technologies through collaborative and interdisciplinary research.
- Opportunities for discovery and dissemination of knowledge of natural products and novel pharmaceuticals.
- Leadership in the development and implementation of advanced pharmacy practice models.
- Service to internal and external stakeholders and the general population.
- Opportunities to conduct practice-based and translational research to address health disparities.

Members of the BMS Faculty

Division of Environmental Toxicology

1° Appointment

Dr. John Rimoldi
Dr. Courtney Roper
Dr. Marc Slattery
Dr. Kristie Willett*, Chair

2° Appointment

Dr. Deborah Gochfeld

Division of Medicinal Chemistry

1° Appointment

Dr. David Colby*##
Dr. Robert Doerksen
Dr. Hoang Le
Dr. Jing Li
Dr. John Rimoldi#
Dr. Sudeshna Roy

Division of Pharmacognosy

1° Appointment

Dr. Paul Boudreau
Dr. Dale Nagle
Dr. Vitor Pomin
Dr. Sudeshna Roy
Dr. Marc Slattery
Dr. Cole Stevens*

2° Appointment

Dr. Xing-Cong Li
Dr. Ikhlas Khan
Dr. Shabana Khan
Dr. Samir Ross

Division of Pharmacology

1° Appointment

Dr. Nicole Ashpole
Dr. Jason Paris
Dr. Zia Shariat-Madar
Dr. Gregg Roman
Dr. Joshua Sharp
Dr. James A. Stewart*
Dr. Noa Valcarcel
Dr. Kristie Willett*, Chair

2° Appointment

Dr. David Allen
Dr. Ameeta Agarwal
Dr. Kenneth Sufka
Dr. Ritesh Tandon
Dr. Thomas Werfel

- * indicates Divisional Graduate Program Coordinator
- # indicates Director of Research and Graduate Affairs
- ## indicates Director of Academic Affairs

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WELCOME FROM THE CHAIR

Our department is proud to be one of the four academic departments in the School of Pharmacy. BMS faculty expertise in research and teaching spans four areas including environmental toxicology, medicinal chemistry, pharmacology and pharmacognosy. We offer a highly collaborative environment with a goal to improve health, well-being and quality of life through basic and applied research. BMS graduate programs will prepare you for positions in academia, government and industries including pharmaceutical, chemical and agrochemical. Our diverse graduate community includes faculty and students from around the globe whose research, teaching and service are consistently recognized at the state, regional and national levels for their impact and significance. Welcome to the OleMiss family, we are glad you are here! - Kristie Willett, Chair BMS, January, 2017

INTRODUCTION

This Handbook is intended to acquaint graduate students with applicable policies and requirements relating to study for the Doctorate and Master's degrees in the Department of BioMolecular Sciences and to inform them of the procedures that must be followed in accordance with Graduate School and Departmental Regulations.

This Handbook summarizes the general requirements for the Doctoral and Master's Degrees of Pharmaceutical Sciences with an emphasis in Environmental Toxicology, Medicinal Chemistry, Pharmacognosy, or Pharmacology to serve as a guide for those students who desire to obtain these advanced degrees.

It is in the best interests of the student to acquaint themselves with the location of the Graduate School, and **develop and maintain a friendly and professional relationship with the staff therein**. It is the student's responsibility to keep up-to-date on changes in Graduate School requirements and policies and procedures relating to the degree he/she is pursuing. The Department's Graduate Coordinators can also be of assistance in many instances. Please see <http://gradschool.olemiss.edu/> for resources and information.

This Handbook is to be used as a supplement to the Bulletin of the Graduate School and other applicable information, which may be obtained from the Graduate School office.

ACADEMICS

GENERAL INFORMATION

REGISTRATION

Each semester, each student needs to register for courses during the registration period. The student should secure approval for the schedule of courses by either their **major professor** (if one has been selected) or Graduate Coordinator (if a major professor hasn't been selected). New graduate students should obtain registration instructions from their Graduate Coordinator prior to, or at the beginning of, their first period of enrollment. Continuing or re-admitted students are encouraged to take advantage of the priority registration periods.

Guidelines for Graduate Student Support

The faculty of the Department of BioMolecular Sciences is committed to financially supporting all graduate students at the highest level of support. Financial assistance is dependent upon the availability of funds for this purpose and the student's satisfactory progress toward fulfillment of departmental requirements for the degree sought.

Departmental faculty review all graduate students at least once a year, at the end of each academic year, to determine if satisfactory progress is being made and to guide students towards meeting all requirements and expectations. (See Annual Student Activity Report in appendix)

There are a limited number of graduate teaching assistantships and graduate research assistantships available. Entering students are awarded such assistantships on a competitive basis, while the departmental faculty members base the continuing students' receipt of an award on a review of their scholarly activity and progress toward the degree's objective. Awards are generally made for one calendar year. Students awarded teaching or research assistantships are required to be present during normal working hours at a minimum (weekdays from 8:00 am to 5:00 pm). Students with multiple absences are subject to the loss of their awards.

Students awarded teaching or research assistantships are considered full-time students and may not hold jobs outside of the department. Students taking employment outside of the department automatically forfeit their assistantship.

TIME IN RESIDENCE

The average doctoral student requires four to five years to complete the Ph.D. degree requirements (no student may exceed seven years in their attempt to attain the Ph.D.). As a general rule, after seven years a doctoral student will be dismissed from the graduate program. The average M.S. student requires two to three years for completion of degree requirements (may not exceed four years). As a general rule, after four years a Master's student will be dismissed from the graduate program. Departmental financial support will be terminated at the end of the 5th year for Doctoral students and the end of the 3rd year for Master's students.

APPLICATION FOR A DEGREE

As described in the Graduate School catalog, a student is expected to submit an Application for Graduate Degree Form GS8 during the last semester of resident enrollment (<http://gradschool.olemiss.edu/current-students/forms-and-manuals-library/>). A student's application must be formally approved by the departmental faculty and the Graduate School prior to the beginning of the semester in which the degree is to be awarded and must meet the requirements of the University catalog under which the student was admitted or readmitted to the degree program. All students planning to receive their graduate degrees must be enrolled for at

least 3 hours during the fall or spring semester in which they successfully defend their thesis or dissertation. Students planning to graduate during the summer must be enrolled for at least one hour. It is the responsibility of the student to apply for the degree in a timely fashion.

VACATION AND WORK SCHEDULE

Students receiving assistantships from the department are expected to be present at their assigned desks/laboratories each workday when not in classes (during normal 8 am to 5 pm work hours) as required in the terms of the financial support. Most students find it helpful to work extended hours including nights and weekends, and the department provides encouragement towards such activities by providing 24 hour safe access to departmental facilities to those wishing to take advantage of the opportunity.

When it is required for a student to be absent from duties for an extended period during the day, please notify the appropriate faculty advisor. It is requested that all students notify their advisor when they expect to be away from the department for extended periods.

Holidays are set by the University and can be located online:

<http://www.olemiss.edu/hr/files/benefits/holidays.pdf>

Graduate students are required to work normal staff hours and days, including spring break, working days before the Thanksgiving break, after fall and spring semesters, and the summer breaks.

Students awarded a departmental assistantship are provided with a two-week vacation period each year. It is vital that students inform the appropriate faculty advisor of their plans to take vacation time, and discuss it with them, as early as possible to ensure that their progress to completion of degree requirements not be impeded. Students out for >4 weeks in a 1 year period will have to seek re-admission through departmental faculty – prior approval can be obtained, and we suggest that it be sought prior to finalizing travel plans.

Any personal or sick leave must be recorded on Annual Leave Forms and filed with the administrative assistant for students. Failure to submit such forms can result in a forfeiture of a student's assistantship. All University and federal guidelines on leave (including FMLA, maternity <http://gradschool.olemiss.edu/wp-content/uploads/sites/36/2015/04/Parental-Leave-Policy.pdf>, etc.) will be followed.

ACADEMIC AND RESEARCH PERFORMANCE

A graduate student must maintain an overall GPA of at least 3.0 to graduate. The Graduate School will place a student whose GPA falls below 3.0 in any given semester on academic probation. A student on probation who earns less than a 3.0 GPA the following semester will be dismissed from the program. For PhD students, only grades of A or B are acceptable in the required courses for graduation.

Students have the initial responsibility to recognize when they are having academic difficulties and are expected to initiate steps to resolve the problem. A student can be dismissed from the program not only for failure to maintain an adequate grade point average, but also for such reasons as unsatisfactory progress toward a degree as defined by the department or division, inability to pass a comprehensive examination, failure to prepare or to defend a thesis or dissertation in a satisfactory manner or complete thesis or dissertation work in an acceptable amount of time. **Termination due to inadequate academic progress is a decision made by the department.**

GRADUATE PROGRAM COORDINATION

The department of BioMolecular Sciences has a Director of Research and Graduate Affairs that coordinates with each division's Graduate Program Coordinator (GPC) and runs the Original Research Proposal (ORP) course. The GPC will be your first point of contact with our graduate curriculum, and will continue to serve in an advising capacity throughout your tenure. GPCs also serve as liaisons between you and the UM Graduate School. The GPC for each of the divisions are:

Dr. John Rimoldi, Director of Graduate and Research Affairs

Dr. James A. Stewart, Pharmacology

Dr. David Colby, Medicinal Chemistry

Dr. Cole Stevens, Pharmacognosy

Dr. Kristie Willett, Environmental Toxicology

SELECTION OF A MAJOR PROFESSOR

Students will be required to select a major professor by the end of their first semester in the program.

CURRICULUM

Each Division has curricular requirements:

M.S. AND PH.D. CORE CURRICULA

- a. A core BMS601 class titled “Graduate Student Survival Strategies”, to be taken by all first year graduate students in BMS (offered in the Fall semester).
- b. Seminar BMS641 (taken by students presenting) or BMS643 (taken by students NOT presenting). Graduate students must be enrolled for one of these courses each academic semester (Fall and Spring).
- c. Core classes and electives are required for each division as detailed on their catalog pages
 - o Environmental Toxicology:
 - [ETOX Ph.D. Catalog](#)
 - [ETOX M.S. Catalog](#)
 - o Medicinal Chemistry
 - [MEDC Ph.D. Catalog](#)
 - [MEDC M.S. Catalog](#)
 - o Pharmacology
 - [PCOL Ph.D. Catalog](#)
 - [PCOL M.S. Catalog](#)
 - o Pharmacognosy
 - [PCOG Ph.D. Catalog](#)
 - [PCOG M.S. Catalog](#)

For a full list of BMS, MEDC, PHCG and PHCL courses, **See also** (<http://catalog.olemiss.edu/pharmacy/biomolecular-sciences/courses>)

ENROLLMENT IN CLASSES

Students are responsible for enrolling in classes each semester and summer term. When possible, students should always check with the “instructor of record” of a course before enrolling. In some instances, the course may not be offered, or the student may not have the appropriate background for enrolling in the course.

Students should register for 12-semester credit hours in the fall and the spring semesters, of which only 9 credit hours can be graded with the other 3 as un-graded courses, e.g., dissertation or thesis hours (per Graduate School requirement or there will be a loss of financial scholarships). In general students should not register for intersession or the individual summer sections. Students are also required to register for 6 hours of dissertation or thesis in the full summer term.

SEMINAR REQUIREMENTS

The BioMolecular Sciences Departmental Seminar is designed to benefit our students in multiple ways including:

- Engagement and scientific networking with external speakers.
 - Mentored opportunities to communicate their research via abstract and oral presentation.
 - An opportunity for all of BMS trainees and faculty to engage with research areas outside of their own focus area.
- a. From year 2 until program completion, students will present an annual seminar based on their research progress. Except for the prospectus and MS or PhD defense, annual seminars will be 20 - 25 minutes. Two students will present during a one-hour seminar period. Annual presentations should be designed as they would be for a scientific conference in the trainee's area of expertise.
- b. Prospectus (typically year 3) and MS or PhD defenses will be allotted the full 50-minute time slot
- c. Students are to enroll in one of these two courses each semester:
- Students presenting: BMS 641 (graded)
 - Students not presenting: BMS 643 (Pass/Fail)
- d. All BMS students are expected to attend both the student seminars and the outside speaker seminars (as their class schedule allows)
- If a student (enrolled in BMS 641 or BMS 643) is late for or misses a student seminar, penalties will be ascribed according to the course syllabus.
- e. Titles and 250-500 word abstracts are due to the departmental secretary no later than **one week** before the scheduled seminar for the School of Pharmacy email announcement.
- f. Students are excused from presenting a seminar during the semester in which they present their ORP, if they are not physically on campus (e.g., participating in an internship or off-site field work), or if they are student-employees of the research cores.
- g. BMS 641/643 grades are calculated as detailed in the course syllabus (A-F for BMS 641, Pass/Fail for BMS 643).

THESIS AND DISSERTATION/PROSPECTUS ADVISORY COMMITTEES

- a. A thesis/dissertation committee should be identified, and a first committee meeting held as soon as possible. This is to occur **no later than** the end of the student's second semester for an M.S. student, and no later than the end of the first full academic year for a Ph.D. student.
- b. A Ph.D. committee consists of the student's advisor, **two** other faculty members from the student's major Division (adjunct faculty included) and **one** member from an external Division/department. At least half of the committee must have a primary appointment in the academic faculty. A M.S. committee consists of the student's advisor, **one** other faculty member from the student's major Division, and **one** external member. Additional faculty members can be added to the committee if needed.
 - Membership of the committee is recommended by the student, in consultation with his or her major advisor, and then submitted to the departmental chair for approval.
 - For the thesis and dissertation committees, the student's major professor will serve as chair (or co-chair if the major professor is at the assistant professor rank).
 - At least one of the Division faculty serving on the committee must have a primary appointment in that Division (see page 3 for a comprehensive list).
- c. Once a committee is appointed, the student is responsible for working with their Division's Graduate Program Coordinator to complete the online registration of the committee.
- d. The committee will receive the Annual Student Activity Reports (see below), and they will minimally meet with the student once per academic year, recommended to be early each summer within one month of the annual report submission.
- e. The students must have a committee meeting within 6 months of their defense date.
- f. Committee meetings are minimally to include:
 - 10-15 minute student presentation with a research update
 - Review of the Annual Report
 - Discussion of plans for the coming year, as well as problems encountered to date

ANNUAL STUDENT ACTIVITY REPORT

- a. All graduate students (M.S. and Ph.D.) are required to submit annual reports to their advisor (due May 15th of each year, to be reviewed, commented upon, and signed within 2 weeks; send to administrative assistant for collection prior to June 1st to BMS Department Chair), and to their committee members in preparation for an annual committee meeting (due 2 weeks prior to the meeting). Reports should be compiled according to the rubric (see Appendix) containing:
 - Status of all degree requirements, including:
 1. An ongoing record of classes taken (each Division will have its own list of classes) and grades achieved
 2. Yearly seminar given, with a statement of plans to improve/items to address
 3. ORP status. If completed: grade achieved and passing date
 4. Prospectus projected or completed date
 - Major research accomplishments
 - Papers submitted/published
 - Posters and seminars presented
 - Research goals for the coming year
- b. All signed reports, including advisor evaluations and committee and Director of Research and Graduate Affairs signatures, are to be kept on file by the advisor, the Division's GPC, and the department chair.

QUALIFYING EXAM: THE ORIGINAL RESEARCH PROPOSAL (ORP)

The purpose of the Original Research Proposal (ORP) is to demonstrate that the student:

- Has the ability to generate an original research idea
- Can speak and write effectively about the idea, to convince an audience of its merits
- Can defend the idea when questioned by their ORP committee
- Can demonstrate knowledge of their field

a. An Original Research Proposal (ORP) is a requirement that serves as the official University of Mississippi assessment of qualification for Ph.D. candidacy.

b. The ORP will be scheduled by the Director of Research and Graduate Affairs in the Fall semester following the student's second complete year.

- An additional 1-2 faculty will be added to the student's dissertation committee to complete the ORP committee, to make sure that all divisions of the department are represented. They will be assigned by the Director of Research and Graduate Affairs

- The assignment of a committee and scheduling of the examination will ensure the participation of faculty with expertise relevant to the ORP.

- The Director of Research and Graduate Affairs will appoint one of the ORP committee members to serve as chair of the ORP committee. This person will not be the student's research advisor.

- The student's research advisor will be a nonvoting member of the ORP committee that participates during the commentary after the ORP presentation, but the advisor will not provide any recommendations or guidance to the student concerning the ORP document or presentation prior to the presentation.

- Presentation dates will be assigned as soon as committees are set and are firm regardless of delays in acceptance of the Specific Aims page.

c. Students will register for the 1-credit class (BMS 605) in the Fall semester of the ORP defense.

d. Specific Aims page (Abstract submission). The original idea must be written in the form of a Specific Aims page (one page explaining the idea and specific steps to test it) that is supplemented with a list of important references. The purpose of the Specific Aims page is to allow the ORP committee to disqualify ideas that could not plausibly be crafted into a passing ORP proposal.

- The hypothesis to be tested must: be an original idea from the student; be distinct from the student's planned PhD research subject or other research currently underway in the department; fit generally into their

research discipline; contribute new knowledge in the field in one or more significant ways; not have been proposed before in the ORP program.

- The Specific Aims page must be submitted to the Director of Research and Graduate Affairs by June 1 and will then be forwarded to the student's ORP committee members for review.

- Outcomes (Approve, Revisions Required, Reject)

- Approve: The ORP committee judges that it is plausible for the student to create a passing proposal based on the submitted Specific Aims page. The student will proceed to the full proposal.

- Revisions Required: The ORP committee identifies one or more specific deficiencies. The student will be asked to revise and resubmit the specific aims page.

- Reject: The ORP committee decides that it is not plausible for the student to craft a passing ORP based on the idea. The student will submit a new Specific Aims page on an idea unrelated to the initial submission.

- A vote of acceptable by the majority of the committee is required before the student may proceed to write the full proposal.

e. The ORP document will include:

- 1 page Specific Aims page
- 12- page maximum Research Strategies document (references included separately with no bearing on page count)
- Budget Justification document.
- The Research Strategies document should clearly and thoroughly exhibit the proposal's significance, innovation, and the experimental approach that will be used.
- The ORP document will use 11 point Arial font with 0.5" margins. Figures may be included at the student's discretion, but all parts of figures must be clearly legible.
- The full ORP proposal is due to the Director of Research and Graduate Affairs by August 15.
- After the full ORP is submitted, the student is responsible for filling out the required form authorizing qualifying examination participation (https://gradschool.olemiss.edu/wp-content/uploads/sites/36/2013/11/g5_auth_to_sit_for_exam.pdf) Form GS5 and obtaining signatures from the major professor and the departmental chair. Copies of the form should be submitted to the graduate school via gschoolforms@olemiss.edu, major advisor, graduate coordinator, and departmental secretary.

f. ORP presentation (which does not count as one of the student's annual seminars)

- 20-30 minutes in length, followed by questions from the full audience.

- The remainder of the ORP defense (up to 2.5 hours) is to be a rigorous oral exam consisting of questioning from the ORP committee.

g. ORP defense evaluation and grading:

- Evaluation will follow the approved rubric. The overall score will not be an average of component scores but will be an average of committee members' overall scores after discussion, to be held without the student present. There are two categories of outcomes:
- Students receiving a grade of A or B on their ORP will not be required to re-submit their ORP proposal to the full ORP committee. The ORP committee will provide a list of revisions (if any are required) meant to address deficiencies in the original proposal. The student will complete the required revisions within 60 days and provide the revised document to the ORP chair for approval. The ORP chair will verify that the student made a competent revision to address the ORP committee's concern. Upon approval by the ORP chair, the student will be admitted to candidacy without further requirements
- For students that do not receive an A or B grade on their initial proposal, the ORP committee will provide a detailed evaluation of the proposal, and the student will be required to develop a different original idea and repeat the ORP examination the following semester. The second attempt is not a revision of the initial document; it should be a new original idea to be approved through the Specific Aims page process. Students that do not receive a pass on their first attempt will receive an incomplete grade for BMS 605 until they have completed their second attempt. This second attempt will be conducted identically to the first attempt.
- Students that do not earn an A or B grade after their second attempt will not proceed to candidacy and will be given the option to transition to the MS degree track.
- If students elect not to repeat the ORP process or submit required revisions to the ORP chair, they will receive a failure for the course and not proceed to candidacy.

ADMISSION TO PH.D. CANDIDACY

Once a student passes the ORP requirement, he/she will apply to be admitted for Ph.D. degree candidacy, as outlined below.

After the successful completion of the ORP requirement, the student is responsible for filling out the required form GS5.1 (http://gradschool.olemiss.edu/wp-content/uploads/sites/36/2013/10/g51_admission_to_doctorate_degree.pdf) and obtaining signatures from the major professor and the departmental chair. In this department, the ORP is considered the comprehensive examination. Copies of the form should be submitted to the Graduate School via gschoolforms@olemiss.edu, major advisor, graduate coordinator, and departmental secretary.

This notification to the Graduate School that a doctoral student has successfully completed all portions of ORP (comprehensive examination) is required for admission to candidacy. After admission to candidacy, enrollment must be continuous until the Ph.D. degree is completed.

PROSPECTUS

It is a requirement of the University of Mississippi graduate school that each doctoral student prepare a dissertation prospectus. Specifically:

1. A written dissertation prospectus will be required of every doctoral student (see below for format).
2. An oral defense of the prospectus will be required.
3. A committee will be formed to evaluate the merit of the prospectus. This committee will also serve as the dissertation committee (see page 12 of this handbook).
4. The committee should consist of at least four members. One member, nominated by the dissertation chair, will be external to the discipline. All members of the committee shall have equal voting rights.
5. A single negative vote in the committee will require negotiation among the committee members in order to achieve reconciliation of the point(s) of objection.
6. Only if the committee cannot agree on the merits of the prospectus and, through reasoned discussion, accept the prospectus unanimously, a review process by a committee of the department/school will be invoked.
7. Although a unanimous vote of the committee is necessary in order to accept the prospectus, a majority vote only will be required on the final dissertation defense.
8. An email from a member of the committee approving prospectus must be sent to gschool@olemiss.edu. Also, an approved copy of the prospectus in a PDF format must be sent to gschool@olemiss.edu immediately following the defense.
9. Any research involving human subjects must be approved by the Institutional Review Board. Any research using animals must be approved by the IACUC. To determine if these provisions apply, please contact the IRB or IACUC through the Office of Research at x7482 for applications and assistance.
10. When any member of the committee believes that a substantial change in the research plan has been made, the committee will be reconvened. Unanimous approval of any substantial revision is required. A report of substantial changes will be filed in the Graduate School.
11. Any committee member who does not sign the final dissertation must file an objection with the Graduate School.

The written document should include a title, abstract of <500 words, and an overview of the planned dissertation including: approach, preliminary data, and expected outcomes of future experiments. The document should not exceed 10 pages.

The prospectus plan should be presented and defended in a 45-minute seminar (generally a Ph.D. student's 3rd year seminar), to be followed by a committee meeting to discuss the plans and presentation.

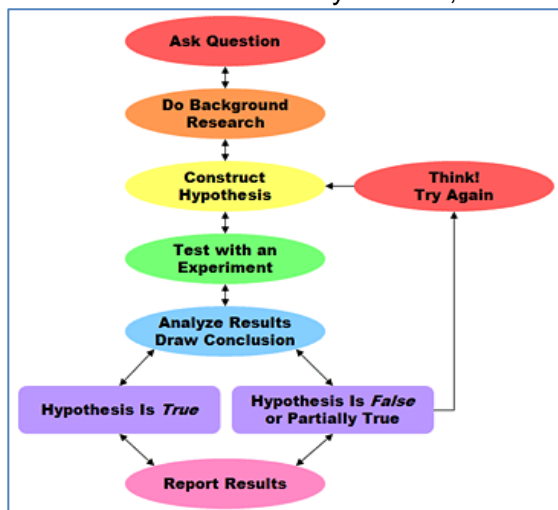
The dissertation prospectus oral defense and completion of the dissertation defense cannot occur during the same full term (fall, spring, full summer), and there must be a minimum of four calendar months between these events.

Graduate School Form – <https://gradschool.olemiss.edu/facultygpcs/graduate-program-coordinators-handbook/academic-progression-policies-and-procedures/>

THESIS AND DISSERTATION PREPARATION

The Graduate School's *Thesis and Dissertation Preparation Manual* can be found online at: http://gradschool.olemiss.edu/wp-content/uploads/sites/36/2013/11/Theses-and-Dissertations-Manual_final.pdf. Their requirements are very specific and must be followed.

The dissertation or thesis in the Department of BioMolecular Sciences will be a high-quality compilation of the student's research, should include a survey of or introduction to the current knowledge base in the research area, and should adhere to the format and style suggested by the Graduate School. As you write, remember the steps of the scientific method are to:



In a thesis/dissertation these points generally fit into a standard format:

1. Introduction
2. Hypothesis
3. Experimental (or Methods and Materials)
4. Results
5. Discussion
6. Appendices
7. Vitae

Copies of older theses and dissertations are available in the departmental office and can be checked out for short periods of time.

Not only is the thesis/dissertation the compilation of your research, it also represents the experiments and analyses that will always be proof of the conclusions to your hypotheses. In this vein, it is critical for the student to include as much raw data as possible in the dissertation. Such data is commonly inserted in the form of an appendix or set of appendices. Common data elements include ^1H , ^{13}C NMR spectra, UV, IR, LCMS, HRMS, elemental analysis, computer programs or macros used, spreadsheets, Western blots, PCR gels, IHC images, etc. Your research must be able to withstand rigorous critique by the scientific community, and the standard in the business is that a thesis/dissertation/manuscript must contain all of the information needed to repeat the experiments and obtain the same results. A basic rule of thumb is that the more data, the better. The student should consult closely with his/her major professor and advisory committee on what data are necessary to include.

A thesis/dissertation is considered a rough draft until the required number of advisory committee members officially approves and signs it.

The final draft of the thesis/dissertation should contain all scientific data, be free of spelling, grammatical, and other errors, and meet all formatting requirements as set forth by the Graduate School (note: these may change over time so don't rely on older dissertations for formatting). This draft must be provided to the advisory committee members 2 full weeks in advance of the final oral examination (defense). The graduate school should be notified of the final defense via form GS7 also two weeks prior to the defense (http://gradschool.olemiss.edu/wp-content/uploads/sites/36/2016/01/g7_authorization_for_final_exam_rev2016.pdf). The candidate should provide an electronic copy and a hard copy to the members of the advisory committee, and as a courtesy, an electronic copy to any member of the departmental faculty whom requests it.

Special notes:

- a. Students may start writing their thesis/dissertation after their advisory committee gives permission (majority of committee must agree, including advisor).
- b. Defense of thesis/dissertation work will be presented in a public seminar, with questioning open to the public, and then further questioning by the advisory committee in a closed session (see below).

ACADEMIC & RESEARCH ETHICS

Ethical behavior is an integral part of any professional career. Graduate students at the University of Mississippi are governed by the academic code of ethics, which can be found in the *University's M-Book*.

<http://conflictresolution.olemiss.edu/m-book/>

In addition, all members of the department must observe the highest research integrity. There are many publications related to research integrity; however, probably the most standard guide is Sigma Xi's *The Responsible Researcher: Paths and Pitfalls*, which can be found at:

<https://www.sigmaxi.org/programs/ethics-and-research/ethics-publications>

The ethical behavior of students is not an issue that is taken lightly in this department and those found guilty of misbehavior will be summarily dismissed from the program.

FINAL ORAL EXAMINATION/DEFENSE

A minimum of two hours should be set aside for the oral examination defense.

The student is asked to present a 40-50 minute overview of their background/rationale, hypothesis, approach, experiments, results, conclusions, future directions, and acknowledgements. Generally a few minutes for questions and answers are allowed, after which the general audience will be dismissed and the advisory committee will begin the oral examination of the candidate. As a courtesy, non-advisory committee departmental faculty members in attendance for the presentation are asked if they would like to participate in the examination.

At the time of the final oral examination, the advisory committee members will have already approved the candidate's overall research conclusions; however, a high-quality presentation and the level of defense expected of a M.S. or Ph.D. candidate, respectively, are required for the successful completion of the examination.

At the time of the defense, members of the advisory committee will also provide the candidate with corrections to be made to the rough draft of the thesis/dissertation. In general, all corrections must be acceptable to the committee members before they will sign a final copy of the thesis/dissertation.

Arrangements must be made by the student for copies of the final dissertation/thesis to be provided to the committee members.

<http://gradschool.olemiss.edu/current-students/the-end-game-preparing-to-graduate/>

The student must bear the expense of reproduction of the dissertation or thesis.

HOODING POLICY

Obtaining a Master's or Doctoral hood is the pinnacle symbol of successfully completing a graduate degree. Thus, hoods will only be donned in graduation ceremonies after the successful defense of one's thesis/dissertation, as described above. Under *no circumstances* is a student to submit their name to the Graduate School for hooding ceremonies. They must request that their names be sent on their behalf by the department, subject to approval. If a student wants to be hooded in the spring graduation ceremonies, documentation of a successfully completed oral defense must be submitted to the department chair **no later than 5 pm** on the last day of the spring semester.

DEPARTMENTAL BUSINESS

GRADUATE STUDENT TRAVEL ON OFFICIAL BUSINESS

From time to time, students travel to scientific meetings. In general, travel is limited to the student presenting their scientific results at regional conferences (e.g., MALTO and ACCP). Major advisors may choose to reimburse students presenting research at a professional meeting. In addition, students should fill out a request for travel assistance from the Graduate School when appropriate. A sample of this form can be found online at:

http://gradschool.olemiss.edu/wp-content/uploads/sites/36/2013/10/2013_travel_form.pdf

Whenever a student is traveling to present a research paper, the travel request should be accompanied by an abstract of the work and evidence that the abstract has been accepted for presentation.

Travel to meetings or field/training sites does not count as vacation. Appropriate travel forms must be submitted at least two weeks prior to the travel date to ensure that the University approves all travel time and related expenses. All travel requests must be approved prior to the trip. Reimbursement, if any is available, for expenses will not be made if travel is undertaken prior to receiving written travel request approval.

The departmental administrative assistants can help with travel related issues and questions; however, the student should prepare well in advance of the trip.

If reimbursement is approved, the University can generally provide advances on some percentage of the expected expenses. In general, travel expense reimbursement is a relatively fast process (usually no more than one week). Reimbursement for expenses will not be made if expense statements and receipts are not turned in within thirty days. The student is responsible for making sure they keep all necessary documentation for expense reimbursement and should ask the departmental secretary for such information prior to the trip.

TELEPHONE USAGE

Telephones in departmental labs and offices are available for local calls only. An attempt has been made to provide a phone where each student can be reached. For students, the Departmental number (915-7101) should be considered an emergency contact. No long-distance calls may be made without permission from the Department Chair or Research Advisor (when applicable). Incoming calls on University phone lines should be kept to an absolute minimum.

COMPUTER USAGE

The Department maintains many computers in its laboratories, which should be treated with care and respect. These computers are NOT personal computers and should not be cluttered with personal data/music/photos/programs unrelated to research activities etc. Although not required, it is suggested that students purchase a personal computer, preferably a laptop, for their class work, personal use and for use at home. The Department does not take responsibility for damage or theft of personal computers. Likewise, labs should be kept locked when not occupied to prevent theft.

The University provides a free web service available to all students, staff and faculty on campus. There are many rules of use and limitations of this service. While most computer/internet rules are obvious, it is highly suggested that all students review the University's appropriate use policy at:

COPYING AND OFFICE SUPPLIES

The use of the photocopier machine for official departmental activities is open to students, faculty and staff of the department. The photocopying of a large number of documents (>50 pages) requires prior approval by a student's advisor and/or the departmental secretary.

Students must not use the departmental photocopier for personal copying.

Office supplies are available from the Administrative Office; however, students are allowed to make purchases for their lab with permission from their advisor.

PURCHASING

The Pharmacy Stockroom currently provides paper towels and certain solvents, but these are not free, and it is necessary to seek permission from your Research Advisor and obtain an account number in order to make a purchase there. For all other purchases, purchase recommendation forms are available in the Department Office. The student's advisor must sign all purchase recommendations before they will be processed. Written quotes must be obtained before the University will generate a purchase order. The student's advisor and/or departmental secretary can help new students get started with this procedure. It is vital that all receipts (generally found within the product shipment package) be given to the departmental secretary immediately upon receipt of materials. Lost or misplaced packing slips will create significant problems, so please pay close attention to this matter.

MAIL

The University prohibits the use of personal mailing and receipt through the campus mail system. The new post office service for all students is called Pak Mail at Crosby Hall, <http://www.pakmailolemiss.com/>

The Departmental secretarial staff will deliver official departmental mail on a daily basis. Student mail will be placed in their assigned boxes in Faser room 436.

SHIPPING HAZARDOUS MATERIAL

Mailing and shipping of hazardous and potentially hazardous materials is highly regulated, and can be a federal crime if abused. There are specific procedures for the mailing of ANY chemical or biological samples. Personnel from the department of [Laboratory Services](#) will provide assistance with package selection, material classification and documentation. It is your responsibility to notify Laboratory Services that you will be shipping a hazardous material, and to make an appointment for assistance in advance of shipping. Directions for transport of potentially hazardous materials can be found on the University's Health and Safety website:

<http://safety.olemiss.edu/>

SHIPPING WITH DRY ICE

Dry ice represents a potential safety hazard. In particular, [shipments involving dry ice](#) are carefully monitored by the University of Mississippi for compliance with Federal laws. If you plan to ship dry ice, you must work with Laboratory Services office on campus to do so. Read their rules, and keep in mind that this often requires 48 hours prep time, so plan accordingly.

RESEARCH SAFETY & SECURITY

Safety Training Requirements

The University mandates that no student may enter a chemical and/or biological research laboratory before successfully completing chemical and/or biological safety training. The training course must be completed within the first two weeks in residence. The departmental administrative assistants can help schedule this training.

The laboratory can be a place of discovery and learning. However, by the very nature of laboratory work, it can be a place of danger if proper common-sense precautions aren't taken. While every effort has been made to eliminate the use of explosive, highly toxic, and carcinogenic substances from the experiments that you will perform, there is a certain unavoidable hazard associated with the use of a variety of chemicals and glassware.

The answers to most questions regarding laboratory safety can be found online at the University's Laboratory Services:

<http://safety.olemiss.edu/safety-programs/chemical-safety/chemical-safety-manual/>
<http://safety.olemiss.edu/safety-programs/biological-safety/biological-safety-manual/>

You are expected to learn and adhere to the following general safety guidelines to ensure a safe laboratory environment for both yourself and the people you may be working near.

The following safety training requirements apply to faculty, staff and graduate students working with biological, chemical, radiological materials or ionizing radiation producing devices on the Oxford Campus, as well as visiting investigators working with these materials under the supervision of trained University personnel on the campus.

- These training requirements will also apply to undergraduate students when they are working in these areas in other than a regularly scheduled University course.
- Use of any of the materials/devices listed below requires the user's signature on the appropriate "Safety Agreement" form.
- You must present Proper Identification (Student ID, Social Security Number, Passport/Visa) at the beginning of the training sessions.

- Please call Laboratory Services to schedule a date and time for your training session(s).
 - Training classes start promptly at the scheduled time. If you are late, you will have to reschedule.
 - <http://safety.olemiss.edu/safety-training/safety-training-information/>
1. **General Biological Safety Training:** All faculty, staff or students working with biological materials are required to take the biological safety-training program and pass a written quiz on biological safety. Annual retraining is not required. Time required for the training is approximately 1.5 hours.
 2. **General Chemical Safety Training:** All faculty, staff and students working with chemicals on the Oxford campus are required to take the chemical safety-training program and to pass a written examination on chemical safety. Annual retraining is not required. Time required for the training is approximately 3 hours.
 3. **Carcinogenic Safety Training:** All University personnel and all students are required to have special safety training in the handling and use of carcinogenic materials and written authorization prior to starting any work with carcinogenic compounds. A laboratory with a Class II or better Fume Hood is required for the handling of carcinogenic materials. A pre-requisite to this training is completion of the General Chemical Safety Training. Application to use carcinogens is made through the Department of Laboratory Services. Annual retraining is not required for continued authorization. Training is part of the Chemical Safety Training.
 4. **Radiological Safety Training Materials:** All University personnel including all students working with, or in areas that use or store, radioactive material are required to have completed the Radiation Safety Training program for Materials, including passing a written examination, and have obtained written authorization prior to working with, or in areas that house, radioactive isotopes. Authorization of personnel to work in University laboratories where personnel use or store Radiological Materials is contingent upon their direct supervisors and Department Heads receiving and maintaining similar authorization. A pre-requisite to this training is completion of the General Chemical Safety Training program and Carcinogen approval. Annual retraining is required for continued authorization. Annual retesting is not required. Time required for the training is approximately 3 hours.

Emergency Procedures

Familiarize yourself with the emergency procedures to adopt in the event of an accident or fire, etc. When the fire alarm sounds, you must exit the building immediately. Personnel are requested to wait on the northeast (“Grove”) side of University Avenue until the “all clear” sign is given. Do not interfere with emergency personnel.

When you come to work in a new laboratory, ask the laboratory supervisor or more senior students about the location of fire extinguishers, fire alarms, first-aid equipment, eyewash facilities and emergency spill kits.

Any questions concerning these safety-training requirements should be referred to the Department of Laboratory Services at 662-915-5433.

Emergency Telephone Numbers

FIRE	9-911
UNIVERSITY POLICE	7234
STUDENT HEALTH SERVICES	7275
BAPTIST HOSPITAL NORTH MISSISSIPPI	9-232-8100
LABORATORY SERVICES	5433

Chemical & Biological Spills/Emergency Spill Procedures

Minor spills should be dealt with as indicated here. Major spills may require the immediate evacuation of an area.

If you have been properly trained, you may clean up a small chemical spill with the assistance of other personnel in your area. For small spills, wear appropriate protective clothing, particularly gloves. Be certain to wash out any cloths/paper towels etc. contaminated with chemicals before disposal. Take corrective action to neutralize toxic or hazardous materials. Wash out any contaminated clothing. Remember to wash protective gloves before disposing of them.

A small spill is defined as a spill where:

1. There is little threat to human health, personnel property, or to the environment, and;
2. There are no injuries beyond what simple first aid can manage, and;
3. The characteristics and the hazards of the material are known, and;
4. You have both the supplies and the knowledge necessary to clean up the materials.

If your spill does not fit all of the specifications above, you have a Large Spill.

1. Report injuries to the University Police at (915)-4911 immediately.
2. Contact Laboratory Services at (915)-5433.
3. Tend to injured personnel if you can do so without putting yourself or others in harm's way

Food & Drink in the Laboratories

Eating, drinking, chewing (including chewing gum and all sweets), and the application of cosmetics are strictly forbidden in all laboratories, office areas within laboratories, preparation rooms and washing-up rooms. This includes the preparation of such items. Food and drink, as well as cups, etc., must not be stored in the laboratories, or in refrigerators, cold rooms, deep freezers or ice storage bins provided for chemical or microbiological use. Smoking is not allowed on the University of Mississippi campus at all and is subject to a fine.

Personal Electronics in Laboratories

The use of personal electronics (e.g., cell phones, tablets, laptops etc.) in laboratory areas may constitute a safety hazard, as well as annoyance to other users. The wearing of headphones is a particular problem, as the user may fail to hear alarms or colleagues in need of assistance, and therefore should not be used in the labs. The use of mobile phones, radios, etc. may be prohibited in certain laboratories or other facilities.

Security

In general, students must assume responsibility for their own personal safety and security of their personal property by practicing common sense and good judgment.

While the pharmacy complex is a relatively safe environment, from time to time personal property is reported stolen. It is incumbent on the student to lock and secure their possessions. If there is a need for special secure storage, the student should consult with their major professor.

All laboratory doors should be left closed and locked from 5:00 pm to 8:00 am on weekdays, and 24 hours a day on weekends and holidays, except when the lab is occupied.

For safety reasons, the laboratory door windows may not be obstructed or covered in any manner.

No student is allowed to perform research experiments alone in the building. If a student must work alone in the laboratory, they are required to notify another individual of their intention, when they will be in the lab and when they leave the lab.

The outside doors of Faser Hall and the Natural Products Center must not be left ajar at night or on weekends for any reason, and can be considered a criminal offense by the University. On days of football games, if you have to enter the building, be especially cautious that you make sure the outside door is locked behind you. Do not allow access to the building to the public when the building is locked.

PERSONAL PROTECTIVE EQUIPMENT

Suitable protective clothing must be worn when working in the laboratories. At the minimum, this means a laboratory coat, properly fastened, and adequate footwear. Open sandals and open-toed shoes are not permitted.

Laboratory coats must not be worn in eating areas and offices in the department or in restrooms of the School or University.

Depending upon the nature of the work undertaken, additional items of protective wear (gloves, plastic aprons, safety spectacles, visors, dust masks, respirator masks, etc.) are available in laboratories or from the storeroom.

One of the most common laboratory accidents that can occur is injury to the eyes through splashing of reagents; therefore, appropriate eye protection must be worn at all times in the laboratory (with the exception of the desk areas).

Gloves are available and the appropriate type should be worn when handling hazardous substances; always check their integrity before use. One must never touch surfaces with contaminated gloves; especially those that receive public use (phones, door handles, etc.) and remove gloves when leaving the work area.

Clean Laboratories

The cleaning of laboratory space is assigned to individual workers. Cleaning items in the lab is not the same as cleaning at home.

The cleaning problems that commonly occur in the laboratory are so varied that they cannot generally be solved using standard household cleaners. Everything that comes in contact with chemicals or biologicals must be free from contaminants before and after use in order to eliminate interference with the research, to ensure personal safety and to protect the environment. Good clean science can only happen if laboratory and production facilities are well cleaned.

For example, in the case of glassware, the minimal procedure is: Rinse the glassware with the appropriate solvent. Use deionized water for water-soluble contents. Use ethanol for ethanol-soluble contents, followed by rinses in deionized water. Rinse with other solvents as needed, followed by ethanol and finally deionized water. If the glassware requires scrubbing, scrub with a brush using hot soapy water, rinse thoroughly with tap water, followed by rinses with deionized water.

Dirty glassware piled in sinks, countertops, and/or hoods is unacceptable.

HAZARDOUS MATERIALS

Any person planning to introduce new equipment, substances or microorganisms into the department that may have any hazardous implications, must address storage, transport, circumstances of use and disposal before the substance or microorganism is introduced into the Department. University rules and regulations may be found at <http://safety.olemiss.edu/>.

ABSOLUTE ALCOHOL 100 & ETHANOL 96 & ETHYL ETHER

Absolute Alcohol 100 and Ethanol 96 are covered under regulations set forth by the Bureau of Alcohol, Tobacco, & Firearms, which relieve them from taxes provided that they are used solely for scientific or medical research, or teaching purposes.

These alcohols are normally issued in quantities up to at least 250 ml and, in general, quantities are expected not to exceed one day's requirements.

Students may not purchase these materials without approval and signatures from their advisors. Research workers and technical staff are responsible for ensuring that no improper use is made of these alcohols. Containers should be kept in a cabinet when not in use.

FLAMMABLE LIQUIDS

Detailed guidance on the use of flammable liquids is provided in the Chemical Safety guidelines. In particular, note that the use of ethanol is subject to legal constraints, and that stocks of flammable liquids in the laboratory should be kept to a minimum.

Always use solvents with the highest possible flashpoints to reduce the risk of creating flammable mixtures of solvent vapor and air. Solvents with flashpoints below ambient temperatures should only be used where absolutely necessary and in as small a quantity as possible.

Due to the manufacturing of illegal drugs, ethyl ether has become highly regulated. When possible, this material should be kept out of sight and its use should be minimized.

In addition, solvents should be kept in flammable lockers except when in use within fume hoods.

WASTE SOLVENT DISPOSAL

Employing the detailed procedures involving the hazardous waste disposal process at the University is extremely important. Laboratories and/or individuals may be cited for improper disposal and an individual can lose all access to research facilities in some cases. Procedures are given in detail at:

<http://safety.olemiss.edu/safety-programs/chemical-safety/chemical-safety-manual/>
<http://safety.olemiss.edu/safety-programs/biological-safety/biological-safety-manual/>

FUME HOODS

The fume hoods are one of the most important safety devices in the Department. All users should be thoroughly familiar with their safe operation. Fume hoods should be used when handling hazardous substances in order to reduce the risk of exposure. The performance of each cupboard is maintained and tested by the Department of Laboratory Services.

The following is a brief guideline only and does not replace proper instruction in fume hood use.

- Always make sure that the fume hood is on before using.
- The sash height should always be as low as possible and in any case never greater than the indicated limit marking when in operation.
- Always place apparatus as far back as possible in the hood.
- Do not obstruct the extract slots at the rear of the hood. Take great care that scraps of paper or metal foil do not get sucked into the ducting as they can damage the fan blades.
- Fume hoods are valuable and expensive pieces of equipment. Never use fume cupboards for storage.
- **Always close the sash when you have finished working at the hood.**
- Although the fume hood sash may give some limited protection against minor explosions, it must never be used as a blast shield. Appropriate safety gear should be worn at all times, even when working in a fume hood.
- Each fume hood is fitted with a device which monitors the airflow, so should an alarm sound or a light flash, do not use the hood. The audible alarm can be turned off.

HAZARDOUS CHEMICALS AND BIOLOGICAL MATERIALS

Research workers should familiarize themselves with the properties of, and the emergency arrangements for, the substances with which they are working. Guidelines for safe disposal of hazardous chemical and biohazards are available through the Department of Laboratory Services. If working with Biohazards, it is suggested to take the Biosafety training offered by the National Center for Natural Products Research. Contact Gray Dale for information.

SHARPS/BROKEN GLASSWARE

Glassware must not be disposed of with normal trash. Building Services Personnel and others have been injured when carrying trash bags with broken glassware in them.

Broken glassware should immediately be cleaned up. Forceps or duct tape can be used to pick up the smaller pieces of broken glass.

Discarded glassware must not contain any hazardous wastes, Medical Waste, Pathological Waste or Radiological Wastes.

If the glassware contains hazardous wastes or Radiological Wastes, please call Health & Safety (5433) for disposal instructions.

Details on the proper disposal of glassware can be found at:

<http://safety.olemiss.edu/safety-training/safety-training-information/disposal-of-laboratory-glassware/>

HYGIENE & LABORATORY TIDINESS

- Do not put your fingers in or near your mouth or eyes.
- Do not chew the ends of pens or pencils.
- Do not scratch or bite your nails.
- Wash your hands frequently, and always before leaving the laboratory.
- Keep your working area clean and tidy; there must be sufficient bench space to allow safe working procedures.
- Keep notebooks, reference books and all other paperwork separate from areas where biologicals or chemicals are being handled.
- Microbial cultures must only be used in appropriate microbiological hoods (not fume hoods) and contamination of anything in contact with them must occur after use, as well as specific disposal requirements. There are specific guidelines for this that ensure the safety of the person working with them and everyone else in the Department.
- Keep aisles and hallways clear.
- In order to give clear visibility and thus avoid collisions, posters and notices must not be attached to the glass of corridor and laboratory doors.
- Equipment and furniture etc. must not be discarded into corridors or stairwells, which must be kept clear for escape in an emergency.

THE OVERNIGHT RUNNING OF EQUIPMENT

In general, experiments and apparatus should not be left running overnight, or outside normal working hours, unless it is absolutely necessary and then only subject to the following conditions:

The user has checked that the apparatus is functioning normally and that all the safety regulations have been complied with. Water pressure may rise at night, so all tubing must be properly secured. Check that waste outlets are clear of obstruction.

The windows in the laboratory door must not be obscured, so that during night patrols the Security staff can see easily into the laboratories.

Unauthorized experiments left running are liable to be terminated and the person concerned held responsible for any damage that might be caused.

AUTOCLAVING

Autoclaves may only be operated by competent, named operators, who have received appropriate instruction both in the normal operation of the machine and in emergency actions and procedures. No operator may carry out any procedure other than those specified in the operating instructions. Autoclaves are too dangerous for unqualified tinkering.

Autoclaves use superheated steam to sterilize materials and supplies for laboratory use and to prepare contaminated items for disposal. Because there are several brands and types of machines, it is the responsibility of the laboratory supervisor to properly train all of the personnel in the safe operation of the specific type of autoclave they are using.

COMPRESSED GASES

Cylinders of compressed gas must carry the correct regulator and must be secured by a bench strap.

When not in use, the cylinder valve should be turned off. Cylinder valves that are stuck, should not be forced open, but should be returned to the manufacturer. Oil or grease must never be used to ease stuck valves or lubricate threads as they can cause an explosion in contact with oxidizing agents.

Cylinders of hydrogen or other flammable gases should only be opened using a bronze spanner wrench to avoid the risk of sparks causing ignition. PTFE tape must not be used on cylinders.

Remember that the valve outlets of combustible gases have a left-hand thread.

Whenever more than one gas is being used, a special non-return valve must be incorporated into the system to prevent the contamination of one cylinder with the contents of another.

Gases that are toxic (e.g. carbon monoxide) must not be used without approval from the Department of Laboratory Services.

REFRIGERATOR & FREEZER SPACE

Only materials which can degrade at room temperature, reaction mixtures, or samples being recrystallized or which are liable to be contaminated should occupy cold space.

Drinks and foodstuffs must not be stored in any cold space designated for laboratory use.

Flammable solvents or reagents may only be stored in spark proof refrigerators.

All containers must be clearly labeled with the name of the contents, the hazard warning sign, the name of the researcher (supervisor and student) and the date. Solutions should not be stored in volumetric apparatus as this impairs the accuracy of the glassware and prohibits their use by others.

Cold space must be regularly cleaned and defrosted and advance notice of this is given. On occasion, failure of cold spaces may necessitate immediate clearance of the space. If either of these scenarios occur in multi-user space, a call for assistance will be made and anyone able to help should offer to do so. Any materials not clearly labeled will be discarded.

Freezer space should not be used for material that could be accommodated in a refrigerator. Likewise, -70°C/-80°C freezer space should not be occupied with material that could be stored at higher temperatures.

Since water and chemical vapors can initiate potentially hazardous chemical reactions, containers in refrigerators and freezers should be tightly sealed and appropriately labeled. Freezers must be defrosted at least once per year and preferably whenever the ice buildup is more than ½ inch thick.

Cold space within the Department is assigned.

If anyone notices issues with cold spaces that might lead to potential failure, notify the departmental secretary immediately so that they can be addressed before they reach emergency proportions.

STORAGE & LABELING

Correct storage and labeling of biologicals and chemicals is a legal requirement.

All containers used to hold chemical or biological substances must be securely closed and clearly labeled to show precisely what each container holds, to whom it belongs (student/researcher and supervisor) and the date it was generated. The label must be written in **plain English**; the chemical formula or uncommon shorthand alone is not acceptable. The concentration of solutions and the solvent used must be stated plus any hazard warning appropriate.

All manufacturer-labeled chemical and solvent containers must show the date on which they were opened, and preferably the dates and amounts after each use.

Labels must not be written over and one label should not be placed upon another.

Toxic and highly toxic chemicals must be stored in locked cabinets or refrigerators, or kept in a secured laboratory.

Always secure the tops of reagent bottles immediately after use and return stocks to their storage safety cabinet.

Solvent bottles and other large glass vessels should not be stored above waist height or left unprotected on the floor.

Flammable liquids must be stored in the fireproof cabinets provided.

VESSELS UNDER VACUUM

Vessels under vacuum must be approved for such use and within the manufacturer's tolerance range.

There is always a risk of implosion of any vessel under vacuum.

All vacuum applications must be performed under a fume hood and/or behind a safety shield.

SYNTHETIC CHEMICAL REACTIONS

All synthetic chemical reactions must be performed in a chemical fume hood in which the sash is appropriately pulled down to still allow for proper airflow. Synthesis performed on a bench top is unacceptable. Violations of this rule can endanger the lives of many laboratory personnel and those found in violation of this rule will be expelled from the graduate program.

POTENTIALLY EXPLOSIVE REACTIONS

Many chemical reactions pose the possible risk of explosion. Always know the risk of any reaction before it is attempted.

Potentially explosives reactions must be performed under a fume hood and behind a safety shield. Violations of this rule can endanger the lives of many laboratory personnel and those found in violation of this rule will be expelled from the graduate program.

All laboratories are equipped with safety shields. If one is unsure whether a reaction requires special safety consideration, use a shield.

RESEARCH DATA COLLECTION

Research data should be collected in a method suitable for publication in an internationally recognized journal and your thesis/dissertation. Students should examine in detail the data presentation requirements as described in the instructions to authors section of a journal appropriate to their scientific discipline. Students should become familiar with these requirements as they gather scientific data. Of course, one's major professor can answer and specific questions.

The student must keep a record of all computer programs, scripts and macros that are written during their degree. The copyrights for all such written materials belong to the University of Mississippi.

Each student is responsible for backing up all of his/her electronic data and notes. The student's supervisor is responsible for providing the backup resources, but the student must make sure that regular backups are performed.

THE LABORATORY NOTEBOOK

The laboratory notebook is one of the basic tools for any experimental work, whether it is basic research, product development, or engineering design. It is primarily for the experimenter's own use, but another person with similar technical background should be able to understand and duplicate any experiment, data, and conclusion, or to prepare a technical report by following only the lab notebook details. Likewise, your advisor must be able to review your work at any point in time.

Your laboratory notebooks **MUST** contain all the information that would be required for you or someone else to completely reproduce your experiment.

A good reference to consult in these regards is the American Chemical Society's (ACS) publication, *Writing the Laboratory Notebook*.

Various electronic notebook programs are now available and students must consult with their major advisor before using these formats.

The research notebook is the property of the Department of BioMolecular Sciences and the University of Mississippi. Upon completion of the degree program, the students may furnish themselves with a photocopy of his/her research notebook but the original lab notebook will remain with the student's major professor.

While each major professor may require somewhat different formats and media, most notebooks contain certain commonalities, which will be discussed here.

There are many reasons to keep an accurate and complete record of experimental work. Among these are:

1. To establish the authenticity of the work.
2. To defend patents.
3. To act as a basis for technical reports and articles.
4. To avoid duplication of effort.
5. To avoid repetition of erroneous procedures.

The nature of the work and the purpose of the experiment will influence the content and format of the laboratory notebook. Many companies and agencies have rigid requirements tailored to specific needs.

Notebooks should be bound, never loose-leaf, and the pages numbers consecutively, preferably by the manufacturer.

A neat, organized, and complete lab notebook record is as important as the investigation itself. The lab notebook is the record of what was done. You must use ink, and write directly in the notebook as the experiment is done. You will have to date and sign each entry. Sometimes you may be required to make an entry of no progress made today, just to show that you were working on the project. If a mistake is made, you should place a single line through the mistake, initial and date the crossed-out region, and start over. This leaves the original entry readable and keeps a permanent record of all your work, which can be used as evidence in a patent court or if there is a question regarding a particular sample or procedure.

Use all the pages of a notebook to prevent accusations of adding data after the fact. If pages are left blank after your graduate career, you should draw a large X on each page. In addition; if blank spaces are on a page, these areas should also have an X drawn through them.

Date and initial each page at the top as it is used.

In industry it is very important to sign and date all work and leave no spaces where additions might be added later in order to preserve the legal integrity of the notebook. Your major professor may require his/her signature in your notebook at the end of each day.

Leave several pages blank at the beginning of the notebook so that they may be used as a table of contents upon completion of experiments.

For each experiment, you should adhere to the following format, or that typically used by your research advisor's notebook protocols. Each experiment should be started on a new page with the following information at the top of every page:

1. date
2. experiment number
3. experiment title
4. your name

On the first page of each experiment list the names of any partners (postdocs, graduate students, undergraduate students, etc.) that worked on this experiment with you. You may start with a data page to include all the data for the experiment. Depending on your graduate advisor, this data page may need to be initialed and dated by the major professor before you leave the lab. Make sure you include all information that will be necessary for use in the final write up. Then start on the following page with:

1. Objectives
Briefly state the major goals of the experiment.
2. Preliminary
State your approach to the experiment, i.e., how you intend to achieve the objectives.
3. Equipment and Supplies List
The manufacturer, chemical formula, purity, and lot number must be used in the identification of all the supplies employed in the experiments. All instruments used must be identified by make, model, and serial number.
4. Procedure
Give essential details on how the experiment was conducted. Make sure that this information is complete. Data should be inserted in the procedure description so that it appears near the corresponding procedure.
5. Results
These are the physical observations, whether it is the temperature of a water bath, a melting point, an explosion (let's hope not), or an NMR spectrum. Record as much detail as possible, there is no such thing as too much observation only too little. Try not to put yourself in the situation of having to repeat an experiment because "I forgot what happened".
6. Conclusions
Write scientific conclusions about the results of the experiment. Base your conclusions on what you actually did, not on what you think you should have done. Be factual and concise. Do not conclude something unless your results actually support that conclusion. Remember a scientific conclusion is a statement about the behavior of some physical system based on the observation of facts.

The laboratory notebook must answer the following questions (the 4 Ws) in at least one part of the report. You can use this as a checklist.

1. What Was Done
2. Who Did It
3. When Was It Done
4. What Were the Results

EQUIPMENT

Scientific laboratory equipment can be extremely expensive to purchase, maintain, and replace; therefore, it is vital that all equipment be kept clean and in working order.

A student should never use ANY equipment on which they have not been trained by an appropriate person in this department, regardless of whether they have been trained on similar equipment at another institution. A student should never use, move, adjust, or modify any instrumentation without prior approval of the person in charge of that equipment. Students should also be vigilant in reporting individuals who do misuse equipment to an appropriate supervisor. A student must immediately report any malfunctioning equipment to the person in charge of the equipment and discontinue use to avoid further damage. After use, a piece of equipment should be left in the condition in which it was found: that is, operational, clean, and ready for the next user.

Failure to obey the above rules will result in the dismissal of a student from the graduate program.

INSTRUCTIONS FOR FINAL CHECK OUT

The general rule of thumb when checking out (i.e., completing your degree and/or leaving the graduate program) is to leave the laboratory as you found it when you arrived. Remember, you are leaving the space to a new student to begin their studies; please don't make them start out by having to clean up your mess.

Each advisor will explain what you are expected to do and how and where you are to place valuable samples, original lab notebooks, printed data and electronic files.

Most importantly, make sure that toxic and dangerous materials are either disposed of or safely stored. You should make your advisor aware of any such materials left in the lab.

Make sure to return all keys to your advisor! Return any borrowed materials to their original sources. Complete and send the Student Employee Exit Checklist form to the departmental administrative assistant <https://www.google.com/search?client=firefox-b-1-d&q=ole+miss+student+employee+exit+checklist>.

Finally, make sure to clean your desk area. Papers, manuscripts, and personal items have a very high disappearance rate once the student/graduate leaves the lab.

APPENDIX MATERIALS

Approximate Timeline for Completion of the Ph.D. or M.S.

BMS Graduate Student Checklist/Cover Letter for Annual Report

Department of Biomolecular Sciences Student Seminar Series

Original Research Proposal Abstract Approval Form

APPROXIMATE TIMELINE FOR COMPLETION OF THE PH.D.

First Year

Emphasis on Coursework
Selection of Research Advisor (*by the end of the first semester*)
Selection of Dissertation Committee (*by end of first academic year*)

Second Year

Continue Coursework: Should Be Completed or Near Completion by the End of Year 2
Well into Research Project
Present First Research-Based Departmental Seminar (30 min)
Begin ORP Requirement and Admission to Candidacy (*start in summer*)

Third Year

Completion of ORP Requirement and Admission to Candidacy (Fall)
Coursework Should Be Completed or Near Completion
Emphasis on Research Project
Present Prospectus Research-Based Departmental Seminar (45-50 min; Spring)
Approval of Dissertation Prospectus

Fourth/Fifth Year

Completion of Research Project
Complete Dissertation and Dissertation Defense
Completion of Graduate School Requirements
Laboratory Checkout

APPROXIMATE TIMELINE FOR COMPLETION OF THE M.S.

First Year

Emphasis on Coursework
Selection of Research Advisor (*by the end of the first semester*)
Selection of Thesis Committee (*by the end of the second semester*)
Present First Research-Based Departmental Seminar (30 min)

Second/Third Year

Complete Coursework
Complete Research Project
Present Research-Based Departmental Seminar
Complete Thesis and Thesis Defense
Completion of Graduate School Requirements
Laboratory Checkout

BMS Graduate Student Annual Report
(Due May 15th to Advisor. Send to Dept
Administrative Assistant for collection prior
to June 1st to Chair)

Name:
Advisor:
Division:
Submission Date:

Synopsis of Student's Previous Year
--

Date Range: _____ - _____

I. Degree Requirements

A. Courses (attach UNOFFICIAL transcript copy to back of annual report; see last page for download Instructions)

- o Address any grades <B, including remediation plans:

B. Seminar

Title:

Date:

Grade:

C. Original Research Proposal

Mark one: Completed Projected

Date approved: _____

II. Research

A. Major accomplishments for year in review

B. Plans for next year

III. Papers Published

A. Complete bibliographic citations for journal articles

B. Posters presented at professional meetings

C. Seminar and oral presentations given, not including department seminar

D. Papers submitted and accepted for publication or presentation

IV. Other Notable Mentions (e.g. grants, awards, teaching, service)

V. Committee Members (list):

Internal:

Major Advisor: _____

Additional Committee Members:

External:

Committee meeting planned date: _____

Graduate Student Checklist

Year 1

- Research
- May 15 – Annual report submitted to Advisor (May 15th) and Department Chair (June 1st)
- Summer – Committee selection and meeting

Year 2

- Research
- Seminar – 25 minute research presentation in early to mid-Spring
- May 15 – Annual report submitted to Advisor (May 15th) and Department Chair (June 1st)
- Summer – Committee meeting
- June – December (Year 3) – ORP
 - Abstract
 - Full proposal due 2 weeks before assigned date (Fall of Year 3)
 - Defense with 30 min proposal on date assigned (Fall of Year 3)

Year 3

- ORP completion
 - Written document due 2 weeks before assigned date
 - 30 min public defense and 2.5 hour meeting with ORP committee
- Research focus

- Seminar – Prospectus (45-50 min) in early Spring
 - Committee meeting to be scheduled after presentation
- May 15 – Annual report

Year 4+

- Research focus
- Seminar – Research (50 min) in Fall
- May 15 – Annual report
- Summer – Committee meeting

***MED CHEM STUDENTS ONLY:**

MALTO presentation date: _____

Date: _____

Attach Unofficial Transcript: Please attach a copy of your **UNOFFICIAL** transcript to the back of this report. Instructions for finding your unofficial transcript are listed below.

1. Go to my.olemiss.edu
2. Sign in using your Ole Miss WebID and password (same information as email and WiFi)
3. Click on the "Student" tab in the upper left corner
4. Under "Academics" folder, select "Request a Transcript"
5. The Transcript Request page outlines the cost associated with sending an OFFICIAL transcript. You will NOT be charged for requesting an UNOFFICIAL transcript. Click "I accept"
6. Next page allows you to review your information. If you have any related holds, it will not affect your ability to acquire your unofficial transcript. Click "Continue"
7. Under "Transcript Version," select "UNIVERSITY UNOFFICIAL"
8. Next question is only relevant to official transcripts, so you may keep that number at "1"
9. Click "Continue"
10. A PDF version of your unofficial transcript should be downloaded onto your computer. Please be patient as it may take a minute to download
11. Print out your unofficial transcript and attach it to the back of your report

Representative Seminar Evaluation Form

Name:

Department of BioMolecular Sciences Student Seminar Series Evaluation Form

Presenter name: _____

Division and year: _____

Intended Conference/Presentation format: _____

Criteria	Poor Quality	Needs Improvement	Average	Very Good	Exceptional
Expertise in the subject area					
Benefit of background on the project					
Clarity of results presented					
Approach to conclusions/future directions					
Overall organization					
Ability to answer questions					
Provide and overall letter grade (A, B, etc.; including +/- scale) for the seminar:					

What were the best slides? (Give examples of slides that helped you understand the work, or clearly presented data)

What were the slides that needed to be improved? (Text too small to read, not color-blind friendly)

Suggestions to improve future seminar presentations:

Other comments:

ORIGINAL RESEARCH PROPOSAL ABSTRACT APPROVAL FORM

Department of BioMolecular Sciences

Student Name: _____ Submission Date: _____

Advisor: _____ Division: ETOX PCOG PCOL MEDC

Abstract Title: _____

YES NO

___ ___ 1) Is the ORP "**original**" (in regard to its concept, hypothesis, approach, etc.)?

___ ___ 2) Is a **hypothesis** clearly stated?

___ ___ 3) Does the abstract clearly describe the ORP's **independent specific aims**?

___ ___ 4) Is the planned **approach(es)** adequately described to establish the ORP's scientific **feasibility**?

___ ___ 5) Do the proposed **specific aims** and **approach(es)** address the stated **problem** or **unmet need**?

___ ___ 6) Does the ORP adequately serve as an **examination** of the student's BMS track-specific education, training, skills, etc.?

Recommendation (Check box)

Accept **Require Revisions** **Reject**

If you **Reject or Require Revisions** for the proposed ORP abstract, what was the reason(s) for your decision?

Committee Signatures and Date of Meeting: _____

ORP Committee Chair _____

Dissertation Advisor _____

ORP Committee Member _____

Dissertation Committee Member _____

Dissertation Committee Member _____

Dissertation Committee Member _____

FINAL ORP RUBRIC (June 21, 2021)

BMS 605: Original Research Proposal: Evaluation Form

This evaluation form is for faculty serving on a student's ORP committee in the Department of BioMolecular Sciences. It is for grade reporting and to assess the student's written proposal, oral presentation, and defense.

Student Candidate: _____ **Date:** _____
Proposal Title: _____

	Score	Comments (write neatly! Please continue below or on back)
Significance		
Approach – Experimental Design		
Innovation – Creativity		
Familiarity with foundational concepts from BioMolecular Sciences		
Familiarity with current leaders and methods from subject area		
Ability to Defend Proposal		
Final Impact Score		

The numerical scores for each category evaluated range from 0-100. 100 is exceptional, 20 or less is poor. Faculty will score each of the six categories. Each member's final impact score will reflect his/her composite evaluation of the six items measured, rather than an average applied to each reviewer's scores given to each criterion.

The average of the committee member's impact scores will be taken and rounded to the nearest whole number, and the student assigned a grade based on the scale:

A (100-70); B (69-50); F (<50)

Additional Comments:

Scoring Rubric

Score	Descriptor	Additional Guidance on Strength/Weaknesses
100	Exceptional	Exceptionally strong with essentially no weaknesses
90	Outstanding	Extremely strong with negligible weaknesses
80	Excellent	Very strong with only some minor weaknesses
70	Very Good	Strong but with numerous minor weaknesses
60	Good	Strong but with at least one moderate weakness
50	Satisfactory	Some strengths but also some moderate weaknesses
40	Fair	Some strengths but with at least one major weakness
30	Marginal	A few strengths and a few major weaknesses
<20	Poor	Very few strengths and numerous major weaknesses
Minor Weakness: An easily addressable weakness that does not substantially lessen merit		
Moderate Weakness: A weakness that lessens merit		
Major Weakness: A weakness that severely lessens merit		

Significance: The student's ability as demonstrated in both the written proposal and oral presentation to formulate a hypothesis that identifies one or more important areas of knowledge lacking in the subject area

Approach - Experimental Design: The student's ability as demonstrated in both the written proposal and oral presentation to design a program of study likely to successfully test the hypotheses described, and to describe this program of study in a manner sufficient to demonstrate thorough understanding of the method(s) used

Innovation - Creativity: The uniqueness of the student's hypotheses and experimental approaches in the context of published literature in the subject area

Familiarity with foundational concepts from BioMolecular Sciences: The student's mastery of foundational concepts from BioMolecular Sciences as demonstrated in the written proposal, oral presentation, and defense. Evaluation of the range of the student's mastery of foundational concepts should be tailored based on the student's course of study

Familiarity with current leaders and methods from subject area: The student's mastery as demonstrated in the written proposal, oral presentation and defense of the existing literature relevant to the proposed research.

Ability to Defend Proposal: The student's ability to answer questions and respond constructively to criticism from the committee during questioning with poise, professionalism and integrity.

**THE UNIVERSITY OF MISSISSIPPI
DEPARTMENT OF BIOMOLECULAR SCIENCES**

ACKNOWLEDGMENT OF GRADUATE STUDENT HANDBOOK

I have read the graduate student handbook and acknowledge my responsibilities as a graduate student and the policies and procedures at the University of Mississippi, Department of BioMolecular Sciences.

Employee Signature:

Date:

Print Employee Name: