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INTRODUCTION

ABOUT THIS HANDBOOK

This handbook is a detailed resource to guide you through your entire program of study, beginning with admissions through graduation. It also serves as a resource for faculty to ensure familiarity with program and university requirements.

BOISE STATE

Located at the base of the Rocky Mountain foothills in Idaho’s capital city, Boise State University is the largest institution of higher education in the state. Boise State has over 22,000 students enrolled and encompasses 175 acres just south of downtown Boise. Located along the Boise River and nestled against foothills, Boise offers many outdoor activities within a short distance such as backpacking and skiing in the high country, mountain biking, boating, or fishing in pristine waters.

Our University has a focus on providing solid education in the STEM (science, technology, engineering and math) areas, and promoting innovation, creativity and research. We have a reputation as an emerging metropolitan research university and a key economic engine in the region. We pride ourselves in fostering an environment where research and creativity thrive, which is shown in the significant research opportunities for graduate students.

ABOUT THE BIOMOLECULAR SCIENCES M.S. PROGRAM

The Biomolecular Sciences M.S. Program represents a highly interdisciplinary research program that offers students the opportunity to combine studies from traditional science disciplines to solve problems at the interface of contemporary fields in the biomolecular sciences.

Our Mission Statement: The Biomolecular Sciences M.S. Program fuses biological, chemical and physical sciences into a single curriculum, removing traditional barriers to interdisciplinary scientific thinking and education, to prepare graduates for success in cross-disciplinary research and development.

In our program you will work closely with faculty to make cutting-edge research contributions in the biomolecular sciences, engage in multidisciplinary education, establish collaborations across
the program’s science departments, and have the potential to interact with local industry partners. With course offerings assembled from various departments, coupled with a core curriculum focusing on fundamental concepts in biomolecular sciences, you can develop a degree plan that supports your research and career interests.

PROGRAM DESCRIPTION

This interdisciplinary program provides training in areas including biochemistry, bioinformatics, biophysics, cell biology, computational biology, molecular modeling, and molecular biology to foster an integrated and quantitative approach to biomolecular studies. The three courses of the core sequence will be taught by faculty in the departments of Biological Sciences (BMOL 601), Chemistry and Biochemistry (BMOL 602), and Physics (BMOL 603), in order to expose students in the program to the perspectives of each of these fields. The goal of the program is to provide graduates with an enhanced understanding of the complex nature of molecules in biological systems.

ADMISSION INFORMATION

To apply for this program, the applicant must satisfy the minimum admission requirements of the Graduate College. International students will want to visit the International Student Admissions office to learn of the additional information that is required for application to the University. Students pursuing graduate studies in this interdisciplinary program typically have an undergraduate degree in biochemistry, biology, biophysics, cell biology, chemistry, computer science, genetics, microbiology, physics, or a closely related field.

Admission to the program is competitive and is based on requirements of the Graduate College, your transcripts, letters of recommendation, GRE scores, personal statement, scientific writing sample and resume/CV. A competitive applicant will have a strong personal statement that is clear and concise, and strong letters of recommendation from faculty and supervisors. Prior laboratory research experience is desirable.

Once the application packet is complete, it will be evaluated by the Biomolecular Sciences Steering committee and an admission recommendation (regular status, provisional status, or denied). If your application meets or exceed admission standards, you will be notified of this and asked to begin the process of identifying a major professor. Once you have identified and faculty member who is willing to serve as your major professor, you will officially be recommended for admission and your application will be forwarded to the Dean of the Graduate College. At that time, the Dean will make the final admission decision and notify you and the program of this decision. If you have received an acceptance from the Graduate College, you will then receive an acceptance letter from the Biomolecular Sciences M.S. Program with further instructions. To accept your position in the program, you must return the admission notification letter with your signature by the deadline stated on the letter.
Undergraduate Prerequisites

<table>
<thead>
<tr>
<th>Course Combination</th>
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</thead>
<tbody>
<tr>
<td>Cell Biology (BIOL 320)</td>
</tr>
<tr>
<td>Biochemistry (CHEM 431)</td>
</tr>
<tr>
<td>or</td>
</tr>
<tr>
<td>Fundamentals of Biochemistry (CHEM 350) PLUS Introduction to Biophysics (PHYS 307)</td>
</tr>
<tr>
<td>Calculus 1 (MATH 170)</td>
</tr>
<tr>
<td>General Physics (PHYS 112)</td>
</tr>
<tr>
<td>or</td>
</tr>
<tr>
<td>Physics with Calculus (PHYS 212)</td>
</tr>
</tbody>
</table>

Note: Undergraduate prerequisites include the above coursework or the equivalent of these Boise State University courses

HOW TO APPLY - DOMESTIC STUDENTS

To apply to the University and the Program please complete the following checklist.

<table>
<thead>
<tr>
<th>Admission Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Application for Admission</td>
<td><strong>Graduate Admissions Application</strong> &lt;br&gt;Note: Application fee must be paid before application is processed.</td>
</tr>
<tr>
<td>□ Official Transcripts</td>
<td>Official transcripts from all colleges and universities attended must be mailed directly to: &lt;br&gt;Graduate Admissions and Degree Services &lt;br&gt;Boise State University &lt;br&gt;1910 University Drive &lt;br&gt;Riveriver Front Hall Room 307 &lt;br&gt;Boise, ID 83725-1110 &lt;br&gt;<a href="mailto:gradcoll@boisestate.edu">gradcoll@boisestate.edu</a></td>
</tr>
<tr>
<td>□ Graduate Record Exam (GRE) Test Scores</td>
<td>Official scores must be submitted by the Educational Testing Services (ETS) directly to Boise State University. (Our school code is R4018)</td>
</tr>
</tbody>
</table>
HOW TO APPLY – INTERNATIONAL STUDENTS

To apply to the University and the Program please complete the following checklist.

<table>
<thead>
<tr>
<th>Admission Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Application for Admission</td>
<td><strong>International Graduate Application</strong></td>
</tr>
<tr>
<td></td>
<td><em>Note: Application fee must be paid before application is processed.</em></td>
</tr>
<tr>
<td>□ Official Transcripts</td>
<td>Official transcripts (an official transcript lists the grades or marks for all courses taken while studying at an educational institution) from all colleges and universities attended or from the Ministry of Education must be sent in a sealed envelope directly to: Boise State University, 1910 University Drive, Boise, ID 83725-1320.</td>
</tr>
<tr>
<td>□ Graduate Record Exam (GRE) Test Scores</td>
<td>Official scores must be submitted by the Educational Testing Services (ETS) directly to Boise State University. (Our school code is R4018).</td>
</tr>
<tr>
<td>□ Official TOEFL or IELTS scores</td>
<td>Official TOEFL or IELTS scores sent directly from ETS (institutional code R4018). The Biomolecular Sciences Ph.D. Program requires a minimum TOEFL score of 550/213/80 (paper-based test/computer-based test/Internet-based test). The IELTS test minimum score is a 6.0.</td>
</tr>
<tr>
<td>□ Other materials required by International Admissions</td>
<td>Submission of additional materials required by the International Students Admissions Office (see the Graduate Students Admissions Checklist).</td>
</tr>
<tr>
<td>□ Three Letters of Recommendation</td>
<td>Request letters of recommendation from academic or professional references that can provide an evaluation of your ability to perform and succeed at the graduate level.</td>
</tr>
<tr>
<td>□ Personal Statement</td>
<td>A brief personal statement (no more than 1750 words) describing the applicant’s academic and professional background, career goals, and the names of 3-6 faculty members you are most interested in working with (see section Selection of Major Advisor).</td>
</tr>
<tr>
<td>□ Scientific Writing sample</td>
<td>Examples of samples that can be submitted are posters, articles submitted for review, published abstracts, term papers, etc.</td>
</tr>
<tr>
<td>□ CV or Resume</td>
<td>A resume listing educational training, awards, publications, poster presentations, grants, etc.</td>
</tr>
</tbody>
</table>

If you need additional help with the International Admissions process, please contact that office at 208-426-1757 or by email at interntl@boisestate.edu. For questions regarding the specific Program applications materials, please contact the Biomolecular Sciences Ph.D. Program at 208-426-2844 or biomolecularphd@boisestate.edu
APPLICATION DUE DATES

January 10th - Fall General Admissions Deadline

May 7th – Late Applications

August 15th - Spring General Admissions Deadline

International Student Applicants are encouraged to begin the admissions process several months prior to the admissions deadline. This allows time for potential delays in the processing of visa and entry documents by the U.S. Department of Immigration.

IF YOU ARE ACCEPTED

Welcome! We are very excited to have you join our program! To prepare for your move to Boise, you will want to learn about the area and look for housing. To learn about Boise and the surrounding areas, Boise Chamber of Commerce has an informative site that talks about the area and has a great site about relocating to our beautiful city.

Boise State University offers many on-campus housing options. To discover these opportunities, visit Housing and Residence Life. For off-campus housing, The Boise Chamber of Commerce lists several real estate agents, or you can search Craigslist or the internet for home rentals and apartments online. Neighborhoods that are close to campus include: Downtown Boise, East End, North End, the Bench and Southeast Boise.

IF YOU ARE NOT ACCEPTED

Admission into graduate school, and this program, is competitive. Qualified applicants may be denied admission for various reasons. You will receive a letter from the Graduate College stating that you have not been accepted. If this is the case, you can reapply in subsequent semesters by filling out the Graduate Application (you do not need to pay the application fee again) and notifying the Program that you plan to reapply.

FINANCIAL SUPPORT

Currently the Biomolecular Sciences M.S. program is not able to provide progrmmatic assistantships. However, students are encouraged to contact individual faculty to see whether they have grant-funded research assistantships (RA) available. Some additional scholarships and funding opportunities can be found at http://biomolecularphd.boisestate.edu/scholarships/.

NEW STUDENT ORIENTATION

All new students are required to attend orientation, which occurs the week prior to the beginning of classes. An information packet detailing the schedule of events will be e-mailed to new
students. This orientation provides an opportunity to meet with the graduate program director, faculty, staff members, and to attend an academic advising session to become familiar with program procedures and facilities. Students should bring proof of citizenship (e.g., driver’s license and social security card, or valid passport). Students will also pick up keys and proxy cards, and complete laboratory safety, and human resource compliance training during this time.

SELECTION OF MAJOR ADVISOR

Prior to being formally admitted into the MS program, students should identify their major advisor. No student may remain in the program without a major advisor for any extended period. Should a student find themselves without a major advisor at any time, they should attempt to identify a new advisor as soon as possible. If a new major advisor is not identified at the end of four weeks time, a student can be dismissed from the program.

SUPERVISORY COMMITTEE

The graduate supervisory committee assumes the responsibility for approving the student's program, and advising and evaluating thesis or project research. The committee consists of the major advisor who serves as chair and holds a tenure-track faculty position in one of the three departments of Biological Sciences, Chemistry/Biochemistry, and Physics, plus at least two tenure-track faculty that represent at least one of the other departments, but no more than five members in total. One of the committee members may include an otherwise qualified individual (e.g., Ph.D., D.V.M., M.D.) from outside of these three departments, but their expertise relevant to the student’s dissertation project must be documented prior to committee appointment and a formal request made and approved by the program. All members of the supervisory committee must have graduate faculty status, as appointed by the Graduate College.

Selection of the supervisory committee typically begins with the graduate student and major advisor agreeing on a potential committee membership list based on the student’s thesis or project focus. The student then fills out and submits an Appointment of Supervisory Committee form (found at http://www.boisestate.edu/gradcoll/forms/form_grad/committee26.pdf). This form should be submitted as soon as the project/thesis topic is defined. The graduate dean can either appoint the recommended committee or solicit an alternative recommendation from the program. Changes in membership of the committee can be made after its appointment, but only in accordance with program policies and with the approval of the Graduate College.

Students will typically interact with members of the Supervisory Committee on a frequent basis, either individually or informally in classes or working on research. Students should organize a formal meeting with the entire Supervisory Committee at least on an annual basis to present a progress report, receive feedback, and discuss future research plans. It is the student’s responsibility to schedule these meetings.
APPEALS PROCESS

A process exists whereby students or faculty in the program can appeal decisions made by the program’s Faculty Steering Committee. Individuals wishing to file an appeals petition should contact the program director for guidance on materials to assemble and the steps involved in the appeals process.

GENERAL COURSEWORK AND DEGREE REQUIREMENTS

<table>
<thead>
<tr>
<th>Master of Science in Biomolecular Sciences</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core Sequence</strong></td>
<td></td>
</tr>
<tr>
<td>BMOL 601 Biomolecules I</td>
<td>4</td>
</tr>
<tr>
<td>BMOL 602 Biomolecules II</td>
<td>4</td>
</tr>
<tr>
<td>BMOL 603 Biophysical Instrumentation and Techniques</td>
<td>4</td>
</tr>
<tr>
<td><strong>12</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Additional Required Courses</strong></td>
<td></td>
</tr>
<tr>
<td>BMOL 598 Graduate Seminar</td>
<td>2</td>
</tr>
<tr>
<td>BMOL 605 Current Scientific Literature</td>
<td>1</td>
</tr>
<tr>
<td>BMOL 511 Advanced Cell Biology</td>
<td>3</td>
</tr>
<tr>
<td>BMOL 516 Responsible Conduct in Research</td>
<td>1</td>
</tr>
<tr>
<td>PHYS 507 Molecular and Cellular Biophysics</td>
<td>4</td>
</tr>
<tr>
<td>BMOL 598 is a one-credit course to be taken two times.</td>
<td></td>
</tr>
<tr>
<td><strong>11</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Additional graduate courses and a culminating activity chosen from one of the following possibilities</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Thesis</strong></td>
<td></td>
</tr>
<tr>
<td>BMOL 593 Thesis</td>
<td>7</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td></td>
</tr>
<tr>
<td>BMOL 591 Project</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>30</td>
</tr>
</tbody>
</table>
Faculty/students wishing to petition other courses for inclusion as an approved elective should contact the program director for guidance on course material preparation for the faculty steering committee to evaluate. Ideally, this petitioning should happen early in the semester prior to when the course will be offered.
ADMISSION TO CANDIDACY

After completing at least half of the total credit requirements with individual course grade of C or better and a GPA of at least 3.00, students should submit the full academic plan to the Graduate College for review. This is accomplished by submitting an Application for Admission to Candidacy form, which is found at https://graduatecollege.boisestate.edu/wp-content/uploads/2017/10/Application-for-Admission-to-Candidacy.pdf. This form is important because it allows the university to detect problems in the academic plan well in advance of the anticipated graduation date. The candidacy process helps avoid unwelcome surprises that could delay graduation.

Candidacy will be awarded if the academic record meets the following requirements:

- The GPA of the completed courses on the Application for Admission to Candidacy form is at least 3.0, with all individual courses graded C or better.
- At least half of the required credits for the degree have been completed.
- A regular status in the Graduate College has been achieved (no remaining provisional admission stipulations).
- The residency requirement satisfied (one year as a full-time graduate student).

Once candidacy has been awarded, the approved Application for Admission to Candidacy form is the student’s roadmap to degree completion. If candidacy is not awarded, the Graduate College will define the problem(s) that need to be addressed, so that the Application for Admission to Candidacy form can be appropriately revised. This form must be submitted prior to the semester anticipated for graduation. Please check the Academic Calendar at the website http://registrar.boisestate.edu/boise-state-academic-calendars/ for a complete listing of important deadlines for graduate students.

CULMINATING ACTIVITIES

The Biomolecular Sciences Graduate Program offers students with a choice of culminating activities to complete the M.S. degree.

Thesis Option: This research-intensive option is designed to provide graduate training leading to positions such as laboratory managers and technicians, and to prepare students for further training in doctoral programs. The curriculum and thesis research for the Masters of Sciences in Biomolecular Sciences (thesis option) typically takes between two to three years to complete.

Project Option: This option provides students with a good preparation for a Ph.D. program or a more advanced career. The intensive curriculum leading to a Masters of Science in Biomolecular Sciences (project option) can be completed in one and a half years, with no thesis. The nature of the project is determined by the major advisor, the student, and in consultation with the supervisory committee. Examples of projects include, but are not limited to, writing and submitting a review article, completing a research project plus oral defense to their supervisory committee plus written summary, completing an internship relevant to the student’s ultimate career goals (e.g. intellectual property, bio-business) integrated with benchwork plus a written report.
THESIS OPTION REQUIREMENTS

The thesis must be the result of independent and original research by the student, and must constitute a significant contribution to current knowledge in Biomolecular Sciences, typically equivalent to a peer-reviewed publication. Ideally, the thesis research should be submitted for publication prior to the final thesis defense.

The style and format of the thesis must conform to the standards of the Graduate College. The thesis should consist of an abstract, an introductory chapter, research chapters and a final discussion chapter. The introduction should present a review of the state of knowledge in the relevant fields of study and detail how the research advances scientific knowledge. The discussion chapter should integrate the conclusions of the research chapters and suggest future directions of study.

LEAVE OF ABSENCE

You must be continually enrolled in the program and making satisfactory progress to maintain your graduate assistantship. You may apply to the department for an official leave of absence if you cannot maintain continuous enrollment or perform assigned work duties at any time. Official leave of absence will be reviewed for approval on a case-by-case basis. Your assistantship or pay may be affected by an official leave of absence, or your failure to receive approval for a leave of absence. If in doubt on whether to apply for a leave of absence, you should consult with your major professor and the program director as soon as possible. Approved requests for a leave of absence must be in writing or electronic form.

FINAL ORAL EXAMINATION FOR THESIS OPTION

The final oral examination consists of a public presentation of the thesis, followed by a public question and answer session, and an oral defense of the thesis held in private conference with the candidate’s defense committee. Prior to scheduling the final oral examination, a Final Oral Examination Permission Form with signatures from all committee members must be obtained, confirming that the thesis has progressed sufficiently to be defended by the proposed date. Students are encouraged to schedule their defense during the normal academic year.

A defense committee consists of the supervisory committee. The outcome of the final exam is determined by a majority vote. A tie vote is a fail!

You will need to submit a signed Final Reading Approval form and a review copy of the thesis to the Thesis & Dissertation Office in the Graduate College. Once all changes required by the Thesis & Dissertation Office has been completed, you will submit the final copy of the thesis on ScholarWorks, three (3) signed originals of the Defense Committee Approval form printed on regular copy paper. You must submit all required copies and forms by the deadlines stated to ensure that you meet all requirements to graduate for the desired semester.
GRADUATION AND CONCLUDING SURVEYS

Once your dissertation has been signed by the Graduate Dean, you have finished your degree requirements, CONGRATULATIONS!

In order to finish the process, you will need to apply for graduation on Broncoweb and pay the graduation application fee prior to the deadline of the semester in which you plan to graduate. See the Registrar’s page for the calendar of deadlines.

To follow through with the continued collection of feedback that we have been gathering throughout your tenure in the program, you will be asked to provide feedback about the program from time to time. The first chance to provide feedback will be at an interview with the Program Director allowing you to provide feedback on your experience while enrolled in the program. After graduation we will contact periodically you to assess whether the program was successful in providing you the technical skills and knowledge necessary to succeed in your chosen career.

These interviews will enable us to see if the expectations of the program were met, obtain recommendations on changes to the program and enable us to assess the success of the program and pinpoint any areas that need to be improved upon.

COURSE DESCRIPTIONS

BMOL 511 (BIOL 511) ADVANCED CELL BIOLOGY (3-0-3) (S). Contemporary and frontier topics in the biology of microbial, plant, and animal cells covering signal transduction, protein trafficking, membrane structure and transport, cell to cell communication, cellular compartmentalization, and cell biotechnology applications. May be taken for BIOL or BMOL credit, but not both. PREREQ: BIOL 320 or PERM/INST.

BMOL 514 (BIOL 514) FLOW CYTOMETRY RESEARCH TECHNIQUES (0-3-1) (F/S/SU). Provides a basic understanding of flow cytometry principles and applications in research and clinical setting. Students gain ‘hands-on’ experience including staining and separating blood cells, staining of DNA for cell cycle analysis, and purification of rare cell types using a cell sorter. Students apply flow cytometry to a specific research topic. May be taken for BIOL or BMOL credit, but not both. PREREQ: BIOL 320 or equivalent.

BMOL 516 RESPONSIBLE CONDUCT IN RESEARCH (1-0-1)(F). Basic concepts, principles and practices governing research compliance and Responsible Conduct for Research (RCR) in the biomolecular and biomedical areas. The course will utilize on-line Collaborative Institutional Training Initiative (CITI) training modules and group discussions of case studies or lectures presented by professionals in the field. PREREQ: Graduate standing.

BMOL 555 APPLIED CALCULUS FOR BIOMOLECULAR SCIENCES (1-0-1)(S). Review and practice of calculus methods and techniques relevant to qualitative and quantitative descriptions of complex phenomena in the biomolecular sciences. PREREQ: MATH 170; and PHYS 112 or PHYS 112.
BMOL 598 GRADUATE SEMINAR (1-0-1)(S). Seminars by scientists on a wide range of subjects in the areas of biomolecular sciences. PREREQ: Admission to program or PERM/INST. The course is graded Pass/Fail.

BMOL 601 BIOMOLECULES I (4-0-4)(F). An in-depth study of the metabolism of both DNA and RNA at the molecular/mechanistic level. This course will cover the mechanisms of DNA replication, transcription, translation, transposition and repair, as well as those for RNA interference, catalysis, silencing and splicing. Molecular genetics and bioinformatics approaches for studying DNA/RNA and their interactions with proteins will be discussed. PREREQ: BIOL 320, CHEM 431 or CHEM 350 and PHYS 307, MATH 170, PHYS 112.

BMOL 602 BIOMOLECULES II (4-0-4)(S). An in-depth study of proteins focusing on amino acid chemistry, protein structure, protein folding, protein function, membrane biochemistry as well as small molecules, lipids and carbohydrates. This course will discuss modern methods of protein characterization and the use of bioinformatics in understanding the chemistry/function of proteins. Recent developments in proteomics and high-throughput approaches to identifying and assessing protein function will be presented. PREREQ: BMOL 601 or BMOL 603.

BMOL 603 BIOPHYSICAL INSTRUMENTATION AND TECHNIQUES (3-3-4) (F/S). Applications and principles of key physical methods and instruments used for the characterization of the structural, functional, and dynamical properties of biological molecules and their interactions. Methods include single-molecule detection and manipulation; mass spectroscopy; X-ray, electron, and neutron diffraction; spectroscopy (optical, IR, UV, Raman); magnetic resonance (NMR, EPR, MRI); plasmon resonance; birefringence; electrophoresis; and hydrodynamic techniques. PREREQ: BMOL 601 or BMOL 602.

BMOL 605 CURRENT SCIENTIFIC LITERATURE (1-0-1)(F). Written and oral presentation of current topics from the published literature in areas of Biomolecular Sciences aimed at integrating material from the various related disciplines. Course will be multidisciplinary involving in depth discussion and critical analysis of current literature by the students. May be repeated for credit. PREREQ: Admitted to the program.

BMOL 606 PROPOSAL WRITING (0-2-2)(F/S). Written and oral presentation of a research proposal in an area of biomolecular sciences related to the student’s proposed dissertation research project. PREREQ: Admitted to the program and BMOL 601.


BMOL 613 (BIOL 613) MOLECULAR GENETICS (3-0-3) (F/S). An advanced study of genetics in microbial, animal and plant systems, focused on the biochemical and molecular aspects of genetic structure and function. Information obtained from recent genomic analysis and comparisons will be included as well as discussion of contemporary molecular biology techniques and applications and an introduction to genomics. May be taken for BIOL or BMOL credit, but not both. PREREQ: BIOL 310 or equivalent.
BMOL 615 RESEARCH IN THE BIOMOLECULAR SCIENCES (0-3-1)(F). Research conducted by graduate students under the supervision of faculty in Biomolecular Sciences. Students rotate through different research laboratories during the semester to learn new research techniques, review relevant scientific literature, experience different mentoring styles and laboratory environments, and contribute to a research team’s generation of hypotheses and data interpretation. PREREQ: PERM/INST.

BIOCHEM 512 INTERMEDIARY METABOLISM (3-0-3)(S) (Alternate years). An investigation into several anabolic, catabolic, and signaling processes in the cell. Special attention will be given to molecular mechanisms and regulation. Students will make extensive use of primary literature. PREREQ: CHEM 433 or PERM/INST.

BIOCHEM 513 ADVANCED ENZYMEOLOGY (3-0-3)(S)(Alternate years). A deeper look into the catalytic and kinetic mechanisms of enzymes. Modern methods for studying enzymes will be included as well as learning strategies for studying steady state and transient enzyme kinetics. Students will make extensive use of primary literature. PREREQ: CHEM 322 and CHEM 433 or PERM/INST.

BIOL 501 BIOMETRY (4-0-4)(F). An application of statistical methods to problems in the biological sciences. Basic concepts of hypothesis testing; estimation and confidence intervals; t-tests and chi-square tests. Linear and nonlinear regression theory and analysis of variance. Techniques in multivariate and nonparametric statistics. PREREQ: MATH 147 or equivalent, or PERM/INST.

BIOL 503 ADVANCED BIOMETRY (3-3-4)(S)(Even years). A survey of experimental design and selected multivariate techniques. The course is designed to assist students in selecting proper statistical techniques for gathering and analyzing biological data, and correctly interpreting the statistical analysis of their data. Prior experience with Statistical Analysis System (SAS) is helpful. PREREQ: BIOL 501 or PERM/INST.

BIOL 509 MOLECULAR ECOLOGY (3-0-3)(F)(Odd years). Theory and methodologies. Use of molecular genetic markers to study ecological phenomena (e.g., mating systems, parentage and kinship, population structure, gene flow, dispersal, natural selection). Emphasis on a hypothesis-testing approach. Appropriateness of particular molecular techniques to specific research questions. PREREQ: BIOL 323 and BIOL 310 or PERM/INST.

BIOL 510 PATHOGENIC BACTERIOLOGY (2-6-4)(S). Medically important bacteria, rickettsia, and chlamydia are surveyed with emphasis on their pathogenicity, host-parasite relationships, and the clinical and diagnostic aspects of the diseases they produce in humans and animals. PREREQ: BIOL 320 and BIOL 303.

BIOL 511 (BMOL 511) ADVANCED CELL BIOLOGY (3-0-3) (S). Contemporary and frontier topics in the biology of microbial, plant, and animal cells covering signal transduction, protein trafficking, membrane structure and transport, cell to cell communication, cellular compartmentalization, and cell biotechnology applications. May be taken for BIOL or BMOL credit, but not both. PREREQ: BIOL 320 or PERM/INST.
BIOL 514 (BMOL 514) FLOW CYTOMETRY RESEARCH TECHNIQUES (0-3-1) (F/S/SU). Provides a basic understanding of flow cytometry principles and applications in research and clinical setting. Students gain ‘hands-on’ experience including staining and separating blood cells, staining of DNA for cell cycle analysis, and purification of rare cell types using a cell sorter. Students will apply flow cytometry to a specific research topic. May be taken for BIOL or BMOL credit, but not both. PREREQ: BIOL 320 or equivalent.

BIOL 520 IMMUNOLOGY (3-0-3)(S). Principles of immunology, host defense mechanisms, the immune response, immune disorders, serology, and related topics. PREREQ: BIOL 320.

BIOL 521 IMMUNOLOGY LABORATORY (0-6-2)(F/S). Modern immunological laboratory techniques including flow cytometry, immune system physiology, antibody-based assays including ELISA, vaccine design, and immuno-bioinformatics. COREQ: BIOL 520.

BIOL 531 PHARMACOLOGY (3-0-3)(F). Basic pharmacological principles including mechanisms of drug action in relation both to drug-receptor interactions and to the operation of physiological and biochemical systems. Pharmacokinetics, metabolism, receptor theory and an examination of major classes of therapeutic agents used in humans. PREREQ: BIOL 227-228 or BIOL 191-192, and BIOL 320.

BIOL 539 VACCINOLOGY (3-0-3)(S). Discussion of the history, safety, epidemiology, molecular biology and immunology of vaccines. Development of the next generation of vaccines to combat infectious disease of global importance, such as HIV, malaria and tuberculosis, also will be discussed. PREREQ: BIOL 320 or PERM/INST.

BIOL 540 GENERAL AND MOLECULAR TOXICOLOGY (3-0-3)(F/S). General and molecular principles of mammalian toxicology including toxicant disposition, mechanisms of toxicity, target organ toxicity, and major classes of toxic agents. PREREQ: BIOL 320 OR PERM/INST.

BIOL 541 MOLECULAR BIOLOGY OF CANCER (3-0-3)(S). A treatment of the basic biology of cancer and the process of tumor progression. Topics examined will include oncogenes, tumor suppressor genes, and the causes of cancer. PREREQ: BIOL 320, BIOL 310.

BIOL 542 MOLECULAR NEUROBIOLOGY (3-0-3)(F). Emphasis will be on the molecular aspects of neurobiology. Topics will include: cells of the nervous system, neurochemical transmission, nerve terminals, membrane structure and function, electrical signaling, neural development, process outgrowth and myelination and glia, and specific neural diseases including Alzheimer’s disease, Parkinson’s disease, and Lou Gehrig’s disease. PREREQ: BIOL 320 and PHYS 112, or PERM/INST.

BIOL 543 ADVANCED DEVELOPMENTAL BIOLOGY (1-6-2)(F)(Odd years). Application of molecular and cellular methods to current topics in developmental biology. Analysis of current literature in biology with emphasis on the coordinated regulation of gene expression, cellular differentiation and migration. Laboratory studies include model systems such as chick, zebrafish, sea urchin and mouse, utilizing cell/tissue culture, histology, immunohistochemistry, RT-PCR, protein purification, SDS-PAGE, western blot and others. Previous enrollment in BIOL 344 and ZOOL 351 recommended.
BIOL 546 BIOINFORMATICS (2-3-3)(F). Practical training in bioinformatics methods: accessing sequence databases, BLAST tools, analysis of nucleic acid and protein sequences, detection of motifs and domains of proteins, phylogenetic analysis, gene arrays, and gene mapping. PREREQ: BIOL 310 or PERM/INST.

BIOL 547 FORENSIC BIOLOGY (3-0-3)(F). Analysis and interpretation of biological evidence in forensic contexts. Topics include entomology, botany, fingerprints, toxicology, DNA, pathology, anthropology and odontology. PREREQ: BIOL 310.

BIOL 548 PERL FOR BIOINFORMATICS APPLICATIONS (3-0-3)(F/S). The PERL programming language is used to introduce skills and concepts to process and interpret data from high-throughput technologies in the biological sciences. Key bioinformatics concepts are reinforced through lectures, computer demonstrations, weekly readings, and programming exercises from biological sequence analysis and real-world problems in proteomics and genetics. PREREQ: BIOL 446 or PERM/INST.

BIOL 549 GENOMICS (3-0-3)(F/S). A fusion of biology, computer science, and mathematics to answer biological questions. Topics include analyzing eukaryotic, bacterial, and viral genes and genomes; locating genes in genomes and identifying their biological functions; predicting regulatory sites; assessing gene and genome evolution; and analyzing gene expression data. PREREQ: BIOL 310 and MATH 254, or PERM/INSTR.

BIOL 551 DEVELOPMENTAL BIOLOGY (2-6-4)(S)(Odd years). Germ cell development, comparative patterns of cleavage and gastrulation, neurulation and induction, and development of human organ systems with emphasis on molecular and cellular mechanisms. Laboratory studies of sea urchin, frog, chick, and pig development. PREREQ: BIOL 191-192 or PERM/INST.

BIOL 565 ADVANCED TOPICS IN MOLECULAR BIOLOGY TECHNIQUES (1-0-1)(F). Discussion of scientific literature with emphasis on modern molecular biology techniques. Students lead discussions and present articles from relevant primary literature. May be repeated once for credit. PREREQ: BIOL 310 and PERM/INST.

BIOL 566 ADVANCED TOPICS IN MOLECULAR, CELLULAR AND DEVELOPMENTAL BIOLOGY (1-0-1)(S). Discussion of current research. Students lead discussions and present articles, as well as monitor recent relevant primary literature. Previous enrollment in BIOL 465 or BIOL 565 recommended. May be repeated once for credit. PREREQ: BIOL 310 and PERM/INST.

BIOL 570 GENETIC ENGINEERING AND BIOTECHNOLOGY (3-0-3)(F/S). Applications of biotechnology, genetic engineering, and recombinant DNA technology in medical diagnosis and therapy, agriculture, microbial biology and environmental systems. The principles and application of recombinant DNA technology in industrial, agricultural, pharmaceutical, and biomedical fields are discussed. PREREQ: BIOL 310.

BIOL 613 (BMOL 613) MOLECULAR GENETICS (3-0-3) (F/S). An advanced study of genetics in microbial, animal and plant systems, focused on the biochemical and molecular
aspects of genetic structure and function. Information obtained from recent genomic analysis and comparisons will be included as well as discussion of contemporary molecular biology techniques and applications and an introduction to genomics. May be taken for BIOL or BMOL credit, but not both. PREREQ: BIOL 310 or equivalent.

**BIOL 623 ADVANCED IMMUNOLOGY (1-0-1)(S).** An advanced study of the cellular and molecular regulation of the immune response. The course will include formal lectures, student presentations, in-depth discussion of selected topics using the current literature. PREREQ: BIOL 520 or PERM/INST.

**BOT 523 MOLECULAR AND CELLULAR BIOLOGY OF PLANTS (3-0-3)(F/S).** Molecular and cellular aspects of growth and development of plants and their responses to biological and environmental stimuli. Plant genome organization, mechanisms of gene regulation, techniques to generate transgenic plants, and practical applications of plant biotechnology. PREREQ: BIOL 320.

**CHEM 508 SYNTHETIC ORGANIC CHEMISTRY (3-0-3)(F) (Alternate years).** The scope and limitations of the more important synthetic reactions are discussed within the framework of multistep organic synthesis. PREREQ: CHEM 309 or PERM/INST.

**CHEM 509 INTRODUCTION TO POLYMER CHEMISTRY (3-0-3) (F)(Alternate years).** An introduction to the concepts of polymer synthesis, characterization, structure, properties, and basic fabrication processes. Emphasis is on practical polymer preparation, on the fundamental kinetics and mechanisms of polymerization, and on structure-property relationship. PREREQ: CHEM 309 or PERM/INST.

**CHEM 510 ORGANIC POLYMER SYNTHESIS (3-0-3)(S) (Alternate years).** A study of the synthesis and reactions of polymers. Emphasis is on practical polymer preparation and on the fundamental kinetics and mechanisms of polymerization reactions. Topics include relationship of synthesis and structure, characterization of polymer structure, step-growth polymerization, chain-growth polymerization via radical, ionic and coordination intermediates, copolymerization. PREREQ: CHEM 309 or PERM/INST.

**CHEM 511 ADVANCED ANALYTICAL CHEMISTRY (3-0-3)(F).** Stoichiometry involved in separations and instrumental methods of analysis. The course will be flexible in nature to adapt to the varied background of the students. PREREQ: CHEM 322 or PERM/INST.

**CHEM 521 QUANTUM CHEMISTRY (3-0-3)(F)(Alternate years).** Formal introduction to quantum mechanics, Dirac notation, angular momentum and operator algebra. Emphasis will be placed on electronic structure theory, reaction mechanisms and the use of modern quantum chemistry theoretical packages. PREREQ: CHEM 322, or PHYS 309 and PHYS 432, or PERM/INST.

**CHEM 522 SPECTROSCOPY (3-0-3)(F)(Alternate years).** Concepts and practical usage of modern chemical spectroscopic techniques, including electronic absorption, infrared/Raman, X-Ray/EXAFS, magnetic resonance and magnetic circular dichroism. Emphasis will be placed on the application of these techniques to the structure/function characterization of chemical and biochemical systems. PREREQ: CHEM 521 or PERM/INST.
CHEM 523 CHEMICAL KINETICS (3-0-3)(F)(Alternate years). A comprehensive study of the role of quantum chemistry and thermodynamics in chemical reactions. Emphasis will be placed on determining reaction coordinates and transition states. Extensive use will be made of modern computational chemical computer programs for calculating potential energy surfaces and transition states. PREREQ: CHEM 322, or PHYS 309 and PHYS 432, or PERM/INST.


CHEM 551 BIOINORGANIC CHEMISTRY (3-0-3)(S)(Alternate years). Exploration of the vital roles that metals play in biochemical systems. Emphasis is on transition metals in biology. Course will focus on structural, regulatory, catalytic, transport and redox functions of bioinorganic systems. PREREQ: CHEM 322 or PERM/INST.

CHEM 560 INTRODUCTION TO NMR SPECTROSCOPY (1-3-2) (Offered intermittently). This course will instruct students on the theory and practice of one- and two-dimensional NMR spectroscopy. Emphasis will be placed on using the NMR spectrometer to solve a variety of chemical and biological problems. PREREQ: CHEM 322, or PHYS 309 and PHYS 432, or PERM/INST.

CHEM 561 INTRODUCTION TO MOLECULAR MODELING AND COMPUTATIONAL CHEMISTRY (1-3-2)(Offered intermittently). Overview of modern computational chemistry. Use of computational chemistry tools and their application to problems of chemical and biological interest. PREREQ: CHEM 322, or PHYS 309 and PHYS 432, or PERM/INST.

COMPSCI 510 DATABASES (4-0-4)(S). A study of the theoretical foundations of database management systems. Design and implementation of alternatives for various database models, including, but not limited to, hierarchical, network, and relational models. Comparison of the reliability, security, and integrity of various database systems. Implementation of a simple systems. PREREQ: COMPSCI 242 or PERM/INST.

COMPSCI 521 DESIGN AND ANALYSIS OF ALGORITHMS (3-0-3)(F). Design techniques such as amortized analysis, dynamic programming, and greedy algorithms. Computational geometry, graph algorithms, primality and other number-theoretic algorithms, specialized data structure techniques such as augmenting data structures, combinatorial graph reduction and functional repetition. NP completeness and approximation algorithms. PREREQ: COMPSCI 242.

COMPSCI 530 PARALLEL COMPUTING (4-0-4)(F). Motivation for parallel computation and survey of different models. Fundamental techniques used in parallel algorithms. Implementation on parallel machines and simulations on clusters of workstations. Distributed computing versus parallel computing. Examples of distributed programming environments. PREREQ: COMPSCI 242 or PERM/INST.

COMPSCI 557 ARTIFICIAL INTELLIGENCE (3-0-3)(F/S). Course will include a survey of some of the following topics, plus a project: Principles of knowledge-based search techniques;
automatic deduction; knowledge representation using predicate logic, semantic networks, connectionist networks, frames, rules; applications in problem solving, expert systems, game playing, vision, natural language understanding, learning, robotics; LISP programming.

PREREQ: COMPSCI 242 and COMPSCI 354 or PERM/INST.


MATH 562 PROBABILITY AND STATISTICS II (4-0-4)(F)(Odd-numbered years). Provides a solid foundation in statistical theory and its use in solving practical problems in the real world. Topics include moment-generating functions, multivariate probability distributions, hierarchical models and mixture distributions, functions of random variables, central limit theorems, estimation, hypothesis testing, multiple linear regression, the analysis of variance, analysis of categorical data, non-parametric statistics. PREREQ: MATH 301, MATH 361 and MATH 275.

MATH 572 COMPUTATIONAL STATISTICS (3-0-3)(F)(Even numbered years). Introduction to the trend in modern statistics of basic methodology supported by state-of-art computational and graphical facilities, with attention to statistical theories and complex real world problems. Includes: data visualization, data partitioning and resampling, data fitting, random number generation, stochastic simulation, Markov chain Monte Carlo, the EM algorithm, simulated annealing, model building and evaluation. A statistical computing environment will be used for students to gain hands-on experience of practical programming techniques. PREREQ: MATH 361.

MBA 503 MANAGING SUCCESSFUL PROJECTS: PLANNING AND PEOPLE (2-0-2)(F). Introduces the front-end issues of project management including team formation, communication strategies, conflict management, project constraints, risk analysis, and tools for project planning. PREREQ: ADM/PROG.

PHYS 504 MOLECULAR AND CELLULAR BIOPHYSICS (4-0-4)(F/S). An advanced introduction to biophysical methods and concepts, focused on developing an in-depth understanding of the functionality of biological systems at the molecular and cellular level. Topics include the biophysical properties of water and solutions, the characterization of biomolecular interactions, the biological relevance of the physical properties of biomolecules, the role of physical interactions in driving the self-assembly and conformational changes of biomolecules, membrane transport, molecular and cellular motility, and biophysical aspects of cell function. PREREQ: MATH 170; PHYS 112 or PHYS 212; PHYS 307, or BIOL 320 and either CHEM 350 or CHEM 431.

PHYS 520 NANOBIOTECHNOLOGY (3-0-3)(F/S). An introduction to the biological and biomedical uses of nanotechnology, including the nature and applications of nanostructures to cell biology, imaging, biosensors, medical therapy (including anti-cancer therapies and drug delivery), and biotechnology. PREREQ: BIOL 191; CHEM 112, MATH 170;
PHYS 112 or PHYS 112 or PHYS 212; PHYS 307; PHYS 309, or BIOL 320 and either CHEM 350 or CHEM 431.

**PHYS 523 PHYSICAL METHODS OF MATERIALS CHARACTERIZATION (3-0-3)(S)**. Physical principles and practical methods used in determining the structural, electronic optical, and magnetic properties of materials. Course topics will include optical, electron, and scanning microscopies, diffraction, surface analysis, optical spectroscopy, electrical transport, and magnetometry. Individual projects will focus on the application of an analytical technique to solve a specific problem. PREREQ: PHYS 309 or PERM/INST.

**PHYS 524 MEMBRANE BIOPHYSICS (3-0-3)(F/S)** Membranes are of fundamental importance for biological systems due to their roles in cellular compartmentalization, signal transduction, metabolism, and energy synthesis. Topics include structures and functions of membrane bilayers and of membrane proteins, physics of membrane fusion, and mechanisms of cell signaling and energy transduction. PREREQ: PHYS 507

**PHYS 536 SOFT MATTER (3-0-3)(F)(Odd years)**. Examples of soft matter include glues, paints, soaps, rubber, foams, gelatin, milk, and most materials of biological origin. Introduction to the principles underlying the physical properties and behaviors of soft matter, including colloids, polymers, gels, and liquid crystals. Expected background: one semester of upper-level thermodynamics from any department. PREREQ: Graduate Standing, MATH 275, PHYS 212, and either CHEM 322 or MSE 308 or PHYS 432.

**PHYS 537 RADIATION BIOPHYSICS (3-0-3)(F/S)**. Physical properties and biological effects of different kinds of radiation: action of radiation on various cellular constituents: target theory, genetic effects, repair of radiation damage, physics of radiology and radiotherapy, isotopic tracers. PREREQ: PHYS 307 or PERM/INST.

**ZOOL 501 HUMAN PHYSIOLOGY (3-3-4)(F/S)**. Functional aspects of human tissues and organ systems with emphasis on regulatory and homeostatic mechanisms. PREREQ: BIOL 320 or PERM/INST.

YOUR FEEDBACK

Your immediate feedback is important to us. Anytime throughout your degree program at Boise State, please do not hesitate to provide your comments regarding your experience in our program. You can provide your feedback to the Program Director, the Program Coordinator, your Major Professor, or teaching faculty, and it will be acted upon in confidence with your, and all of our students, best interest in mind.

STUDENT CONDUCT AND ACADEMIC INTEGRITY

When you enter into the Biomolecular Sciences M.S. program, the program faculty agree to offer their time and resources in exchange for your commitment to perform with high level of
professionalism, to work safely, and with academic integrity. To ensure that students and faculty alike are aware of these expectations, the program, the college and the university have policies in place with which you should familiarize yourself. These policies are outlined in this handbook, the Boise State University Student Handbook at http://vpsa.boisestate.edu/, Boise State University Policies at http://policy.boisestate.edu/, Student Code of Conduct, Graduate Catalog, and Standards and Guidelines for Dissertations.

Dismissal from the program can occur at any time by the program or the university for cause such as unsatisfactory performance of assigned duties, gross negligence of laboratory conduct (including intoxication), insubordination, unsatisfactory academic performance, or unsatisfactory progress toward the degree. The graduate program requires students to maintain an ethical code of conduct and adherence to BSU employee (if receiving an assistantship) and student policies as well as civil laws. Just causes include a felony conviction, failure to report a criminal charge to human resources within 48 hours, or a violation of the university’s code of conduct. Students may be expelled from the program for cause as determined by the graduate program, the Graduate Dean, the Dean of Students, or upper-level university administration.

Academic Dishonesty (plagiarism/cheating) will not be tolerated. Please refer to the university website (www2.boisestate.edu/studentconduct/studentcodeofconduct.htm) for descriptions of academic dishonesty and possible consequences.

The safety of students and all campus personnel is very important to our program and university. All students must comply with university policies and regulations and procedures for working in and around laboratories. Gross negligence of laboratory conduct, including intoxication, will not be tolerated. Prior to engaging in laboratory work, safety training must first be completed. In addition to lab-specific training, general emergency response measures and University Environmental Health and Safety (EH&S) training must be completed. If you have questions regarding possible safety-related issues, please contact your research supervisor, the program coordinator, or the university’s office of Environmental Health and Safety.

NOTICE OF NON-DISCRIMINATION ON THE BASIS OF DISABILITY

Boise State University has issued a notice of Non-Discrimination on the Basis of Disability, which can be viewed at: http://president.boisestate.edu/generalcounsel/noticeofnon-discrimination/

As required by Section 504 of the Rehabilitation Act and the Americans with Disabilities Act (ADA), and the regulations set forth at 34 CFR 104.7, 34 CFR 104.8, and 28 CFR 35.107, it is the policy of Boise State University not to discriminate against individuals in its programs or activities on the basis of physical or mental disability. Boise State University’s Non-Discrimination Policy, which includes the University’s grievance procedures, can be found at the following link: http://policy.boisestate.edu/wp-content/uploads/2012/02/1060_112111.pdf

Qualified students who require disability-related services or accommodations are encouraged to contact the University’s Disability Resource Center, located in Room 114 of the Administration Building on the University’s Main Campus, or by telephone at 426-1583. Information
concerning services provided by the Disability Resource Center can be found on its website:  http://drc.boisestate.edu/.

Other individuals requiring disability-related services or accommodations, or, who have questions or concerns related to the University’s obligations described in this notice are encouraged to contact the University’s Interim 504/ADA Coordinator, located in Room 306 of the River Front Hall on the University’s Main Campus, or by telephone at 426-1238.

UNIVERSITY’S STATEMENT OF SHARED VALUES

Boise State University is committed to personal and social development, educational excellence, and civic engagement. Membership in the campus community is a privilege and requires its members to conduct themselves ethically with integrity and civility. Campus community members enjoy the same rights and freedoms that all U.S. citizens enjoy, including personal responsibility for one’s own conduct, behavior and speech.

Academic Excellence – engage in our own learning and participate fully in the academic community’s pursuit of knowledge.
Caring – show concern for the welfare of others.
Citizenship – uphold civic virtues and duties that prescribe how we ought to behave in a self-governing community by obeying laws and policies, volunteering in the community, and staying informed on issues.
Fairness – expect equality, impartiality, openness and due process by demonstrating a balanced standard of justice without reference to individual bias.
Respect – treat people with dignity regardless of who they are and what they believe. A respectful person is attentive, listens well, treats others with consideration and doesn’t resort to intimidation, coercion or violence to persuade.
Responsibility – take charge of our choices and actions by showing accountability and not shifting blame or taking improper credit. We will pursue excellence with diligence, perseverance, and continued improvement.
Trustworthiness – demonstrate honesty in our communication and conduct while managing ourselves with integrity and reliability.

To view the entire Statement of Shared Values please see the website found at http://osrr.boisestate.edu/sharedvalues/

GRADUATE COLLEGE AND PROGRAM FORMS

Request for Approval of Transfer Credits
Academic Adjustment
Admission to Candidacy
Appointment of Supervisory Committee
Defense Notification

Access Agreement for a Thesis or Dissertation
Defense Committee Approval (thesis)
Final Reading Approval (thesis)
Approval Page for Electronic Copy (thesis)

For selected program forms, see back of this handbook.
**Graduate Student Annual Review**  
Boise State Biomolecular Sciences Graduate Programs

**Instructions**

1. Graduate Assistant (GA) completes own version of the form.  
   ☑️ NOTE: GA’s place their rating in the boxes labeled GA.

2. GA submits their completed forms to faculty advisor.  
   ☑️ NOTE: Faculty advisor place their rating in the checkboxes labeled FA.

3. Faculty advisor/GA meet to discuss their rating and comments.
4. Faculty advisor/GA discuss an action plan for the GA.
5. Faculty advisor writes action plan for GA.
6. Faculty advisor/GA sign the performance review.
7. The GA returns the completed form to the Biomolecular Sciences Graduate Programs office.

**Professionalism**
Rate the GA’s overall demeanor, teamwork, and work in the performance of his or her job-related duties by checking the appropriate boxes for each category.

<table>
<thead>
<tr>
<th>Category</th>
<th>Competent</th>
<th>Developing</th>
<th>Unsatisfactory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td>☐ ☐ Consistently delivers assigned work on time</td>
<td>☐ ☐ Inconsistent about delivering work on time</td>
<td>☐ ☐ Inconsistent about work delivery and/or sometimes fails to deliver assigned work</td>
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<tr>
<td>Timeliness</td>
<td>G A F</td>
<td>G A F</td>
<td>G A F</td>
</tr>
<tr>
<td>Work</td>
<td>☐ ☐ Consistently delivers complete work</td>
<td>☐ ☐ Sometimes delivers complete work</td>
<td>☐ ☐ Rarely or never delivers complete work</td>
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<tr>
<td>Completeness</td>
<td>G A F</td>
<td>G A F</td>
<td>G A F</td>
</tr>
<tr>
<td>Displays initiative and attempts to troubleshoot</td>
<td>☐ ☐ Consistently displays initiative and attempts to anticipate faculty needs</td>
<td>☐ ☐ Sometimes displays initiative and occasionally seeks to anticipate faculty needs</td>
<td>☐ ☐ Rarely or never displays initiative and actively anticipates faculty needs</td>
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<tr>
<td>G A F</td>
<td>G A F</td>
<td>G A F</td>
<td>G A F</td>
</tr>
<tr>
<td>Clarifies expectations when needed</td>
<td>☐ ☐ Consistently clarifies expectations if performance criteria are unclear</td>
<td>☐ ☐ Sometimes clarifies expectations if performance criteria are unclear</td>
<td>☐ ☐ Rarely or never clarifies expectations if performance criteria are unclear</td>
</tr>
<tr>
<td>G A F</td>
<td>G A F</td>
<td>G A F</td>
<td>G A F</td>
</tr>
<tr>
<td>Meeting expectations</td>
<td>☐ ☐ Consistently delivers</td>
<td>☐ ☐ Delivers work of</td>
<td>☐ ☐ Delivers work of poor</td>
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<td>G A F</td>
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<td>G A F</td>
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<tr>
<td>Category</td>
<td>Competent</td>
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<tr>
<td>Demeanor</td>
<td>☐ ☐ Consistently demonstrates a positive attitude toward work</td>
<td>☐ ☐ Sometimes demonstrates a positive attitude toward work</td>
<td>☐ ☐ Rarely or never demonstrates a positive attitude toward work</td>
</tr>
<tr>
<td>Positive attitude</td>
<td>☐ ☐ GA FA</td>
<td>☐ ☐ GA FA</td>
<td>☐ ☐ GA FA</td>
</tr>
<tr>
<td>Willingness to learn</td>
<td>☐ ☐ GA FA Consistently willing to take on tasks outside their comfort zone</td>
<td>☐ ☐ GA FA Rarely willing to take on tasks outside their comfort zone</td>
<td>☐ ☐ GA FA Never willing to take on tasks outside their comfort zone</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>☐ ☐ GA FA Consistently dedicated to doing a good job</td>
<td>☐ ☐ GA FA Inconsistently dedicated to doing a good job</td>
<td>☐ ☐ GA FA Rarely dedicated to doing a good job</td>
</tr>
<tr>
<td>Teamwork</td>
<td>☐ ☐ GA FA Consistently displays an ability and willingness to work well with others, when appropriate, to complete assigned tasks regardless of role</td>
<td>☐ ☐ GA FA Inconsistently displays an ability or willingness to work well with others to complete assigned tasks regardless of role</td>
<td>☐ ☐ GA FA Rarely or never displays an ability or willingness to work well with others to complete assigned tasks regardless of role</td>
</tr>
</tbody>
</table>

Notes and comments about the GA’s demeanor

--

TO BE COMPLETED BY THE STUDENT

- When was the last Supervisory Committee Meeting held, when all of your committee members were present? ___________

Courses Taken

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Title</th>
<th>Grade</th>
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</table>
Research Activities

Describe your research accomplishments and progress during the previous year, including data collection, data analysis, manuscripts submitted or published, conference presentations, etc.

Describe goals for the next academic year (academic, research, professional development, etc.):

TO BE COMPLETED BY ADVISOR AND CO-ADVISOR

Has the student made satisfactory progress? ☐ Yes ☐ No
(Advisor to provide written comments of student’s progress in the space below or as a separate attachment)

Indicate whether the student has performed well on assigned duties, based on specific tasks listed above in the Research Activities section. ☐ Yes ☐ No
(Advisor to provide written comments in the space below or as a separate attachment)

Please list any areas that need improvement and timeframe for improvement:

Discussed development plan to aid GA’s effort to improve performance

GA Signature: __________________________ Date: ____________ Advisor Signature: __________________________Date:

(Required)

Your signature below indicates that you have discussed the contents of this annual review/progress report with your major professor. I further understand that it may have an impact on any work references I receive from the department.

Your signature below indicates that you have discussed the contents of this annual review/progress report with the student and have answered any questions that they had.

Co-Advisor Signature: __________________________ Date: ____________
Co-Advisor Comments:

(Required)

Your signature below indicates that you have discussed the contents of this annual review/progress report with the student and have answered any questions that they had.