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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 Ph.D. PROGRAM

The Biomolecular Sciences Ph.D. Program represents a highly interdisciplinary research program that offers students the opportunity to combine studies from traditional science disciplines to solve important problems at the interface of contemporary fields in the biomolecular sciences.
**Our Mission Statement:** The Biomolecular Sciences Ph.D. Program fuses biological, chemical and physical sciences into a single curriculum, removing traditional barriers to interdisciplinary scientific thinking and education, to prepare the next generation scientists 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. By the end of your degree, you should possess the skills and knowledge necessary to develop a successful career, whether it is in academia, the private sector, or government agencies.

**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 train scientists to conduct high-quality independent research and work as part of an interdisciplinary team to improve the 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 highly 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 excellent letters of recommendation from faculty and supervisors and lab/research experience.

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) 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 Ph.D. 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.

<table>
<thead>
<tr>
<th>Undergraduate Prerequisites</th>
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<tbody>
<tr>
<td>Cell Biology (BIOL 320)</td>
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<tr>
<td>Biochemistry (CHEM 431)</td>
</tr>
<tr>
<td>or Fundamentals of Biochemistry (CHEM 350) <strong>PLUS</strong> 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 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;<strong>Note:</strong> 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>
<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 <strong>Selection of Major Advisor</strong>).</td>
</tr>
<tr>
<td>□ Scientific Writing sample</td>
<td>Examples of samples that can be submitted are original 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,</td>
</tr>
</tbody>
</table>
If you need help with the Graduate Admissions applications process, please contact Graduate Admissions at 208-426-3903 or at gradcoll@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

**HOW TO APPLY – INTERNATIONAL STUDENTS**

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

<table>
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<tr>
<th>Admission Material</th>
<th>Description</th>
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<tbody>
<tr>
<td>□ Application for Admission</td>
<td><strong>International Graduate 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 (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: International Admissions Office 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

December 19th - Fall General Admissions Deadline: Priority financial assistance (assistantships includes stipends and tuition waivers).

May 7th – Late Applications: Late applicants are encouraged to submit applications materials through May 7th. Late applicants remain eligible for offers of financial assistance pending availability.

August 15th - Spring General Admissions Deadline: Financial assistance pending availability. Note: assistantships are typically awarded for fall admissions.

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.

INTERVIEWS

For highly qualified candidates living in the U.S., we sponsor a limited number of campus visits during our “Preview Weekend” where students have the opportunity to meet some of our faculty, tour the campus, and interview. This on-campus interview typically occurs in March. For applicants living outside of the U.S., telephone or Skype interviews will be conducted.

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. Boise State also offers master’s programs in Biological Sciences and Chemistry/Biochemistry.

FINANCIAL SUPPORT

Students should indicate in their application letter whether they wish to be considered for a teaching assistantship (TA), if they have pre-identified a major professor who is able to support them on a grant-funded research assistantship (RA), or if they are able to pay their own way.

Teaching Assistantships are awarded on a competitive basis. Teaching Assistantships cover the cost of tuition and fees, health insurance, and include a bi-weekly stipend. Current annual TA stipends are $25,000. Students accepted on program funded Teaching Assistantships are guaranteed a minimum of three years of support provided satisfactory performance is demonstrated in all areas. Students typically serve as TAs their first two years and roll-over onto an RA in their third year. After that, the major advisor covers the student assistantship from grants. As a TA, you will be assigned, based on your educational background, a course in Biology, Chemistry or Physics to teach. The assignment is typically two 3 hr, labs or three 2 hr, labs per semester.

Students seeking RA support should contact individual faculty members to explore their availability of funds. Research assistantships cover the cost of tuition and fees, health insurance, and include a bi-monthly stipend. Current annual RA stipends are $25,000.

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. During this orientation, students on assistantships will complete all necessary paperwork for their stipend, tuition waiver, and health insurance. Students must 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 TA training, laboratory safety, and human resource compliance training during this time.

TEACHING ASSISTANT TRAINING AND ASSIGNMENTS

For students on teaching assistantships, there is a mandatory teaching assistant (TA) orientation and training session. This typically occurs during the week prior to the first day of fall semester.
This training helps to acquaint students with TA responsibilities and expectations, and provides guidance on how to fulfill specific duties.

The Biomolecular Sciences Ph.D. Program Director will provide information pertaining to TA assignments (course name and instructor) via an information packet e-mailed to students. After receiving teaching assignments (in departments of biological sciences, chemistry/biochemistry, or physics), TAs are requested to contact the course instructor as soon as possible.

**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.

**ASSISTANTSHIP TERMINATION OR REDUCTION**

To maintain your graduate assistantship you must comply with all policies, procedures and timelines outlined in this handbook as well as the policies of Boise State University and the Graduate College. A graduate assistantship may be terminated or reduced at any time by the program or the university for just cause such as unsatisfactory performance of assigned duties, dereliction of 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 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 (both student and employee codes of conduct apply). Students may be expelled from the program for cause as determined by the graduate program, the Graduate Dean, or upper-level university administration.

**SELECTION OF MAJOR ADVISOR AND LAB ROTATIONS**

Students seeking admission into the Biomolecular Sciences Ph.D. Program should familiarize themselves with the research programs of the faculty, which are listed on the program’s web page. Whenever possible, students should contact the faculty members with whom they are interested in working with prior to applying for admission. A current listing of faculty participating in lab rotations can be found on the program’s website under the heading of “Participating Faculty”. The names of 3-6 faculty members (representing at least two of the following departments: Biological Sciences, Chemistry and Biochemistry, and Physics) should be ranked and included in the application materials as part of the student’s personal statement. This information will be used to help place students in lab rotations during their first semester of study. Please note that student interest in a particular faculty member does not guarantee a particular lab rotation placement, and lab rotations may need to include a faculty member that
was not originally listed in the student’s top-ranking.

Laboratory rotations are a central part of our student’s first year experience. Lab rotations allow students to explore various areas of biomolecular research and experience different research environments before committing to a single lab to conduct their dissertation research. These rotations give students the opportunity to learn new laboratory techniques, experience different mentoring styles, meet other graduate students, collaborate with potential mentors, and identify research areas that are of most interest to them. At the same time, rotations allow faculty to assess the aptitude and interests of students. Ideally, students should find a good match with a dissertation laboratory by the end of the first semester. All students accepted into the program on teaching assistantships will complete three 5-week long rotations (which are typically completed by the end of their first semester) before declaring their Major Professor. These rotations must involve faculty from at least two different departments including biological sciences, chemistry/biochemistry, and physics. Although in the minority, some students enter the program to work with a specific faculty member who commits to support their entire program of study from their research grants. These students are not required to participate in the rotation process, but may choose to take advantage to broaden their expertise in a complementary area provided that their Major Professor supports this.

To initiate the lab rotations, students should first interview prospective faculty mentors to determine who is currently able to take on doctoral students. This information is also periodically updated on the program’s webpage. Typically, a student should rotate in a lab only if there is a reasonable option to join that lab permanently, should the rotation go well. By June 1st, students should submit the name of the desired rotation mentors via the submission of the “Rotation Agreement Form” to the Program Director. To optimize the rotation experience, it is important for both the student and faculty mentor to meet prior to the start of the rotation to discuss expectations, laboratory guidelines, and goals. This discussion should be documented on the “Rotation Agreement Form”. During each of the lab rotations, the student needs to balance their time between teaching, research, and coursework responsibilities. Laboratory rotations should be thought of as “auditions”, as not only is the student trying to decide if the mentor and research environment are a good fit for them, but they are also “trying out” for a position in the lab. After a rotation has been completed, the faculty mentor will file the “Faculty Rotation Evaluation Form” and let the student know whether they support serving as their Major Professor. Only after all the rotations have been completed and the student has met with their intended mentor to discuss long-term expectations, goals, and the overall nature of their dissertation research project should the Major Professor be selected. Students are cautioned against joining a lab that is unlikely to have space or financial resources to support a new student in the near future. Although this is not always an easy topic to discuss, it is an important conversation to have.

No student may remain in the program without a major advisor for more than one semester after the completion of laboratory rotations. 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, advising dissertation research, and conducting required examinations. 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. In addition, the majority of the dissertation research project must be conducted within the lab of a faculty member holding a full-time tenure-track appointment in the department of Biological Sciences, Chemistry/Biochemistry, or Physics at Boise State University. 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 dissertation project. The student then fills out an Appointment of Supervisory Committee form (found at http://www.boisestate.edu/gradcoll/forms/form_grad/committee26.pdf), and submits a hard-copy of the form to the program director for approval. The program director then submits the form to the Dean of the Graduate College for approval. This request should be submitted by the beginning of the second year of study. 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 also organize a formal meeting with the entire Supervisory Committee 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 annual 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>Course Number and Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Core Sequence</strong></td>
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<tr>
<td>BMOL 601 Biomolecules I (4 cr.)</td>
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<tr>
<td>BMOL 602 Biomolecules II (4 cr.)</td>
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<tr>
<td>BMOL 603 Biophysical Instrumentation (4 cr.)</td>
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<tr>
<td><strong>Additional Required Courses</strong></td>
<td>17</td>
</tr>
<tr>
<td>BMOL 598 Graduate Seminar (4 cr.)</td>
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<tr>
<td>BMOL 605 Current Scientific Literature (2 cr.)</td>
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<td>BMOL 606 Proposal Writing (2 cr.)</td>
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<tr>
<td>BMOL 607 Graduate Research Presentation (1 cr.)</td>
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<tr>
<td>BMOL 511 (BIOL 511) Advanced Cell Biology (3 cr.)</td>
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<tr>
<td>BMOL 516 Responsible Conduct in Research (1 cr.)</td>
<td></td>
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<tr>
<td>PHYS 507 Molecular and Cellular Biophysics (4cr.)</td>
<td></td>
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<tr>
<td>BMOL 598 and BMOL 605 are one-credit courses that can be applied to meet degree requirements. No more than two credits of BMOL 605 and four credits of BMOL 598 can be applied towards degree requirements.</td>
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<tr>
<td><strong>Approved Electives</strong></td>
<td>5</td>
</tr>
<tr>
<td><strong>Examinations</strong></td>
<td>2</td>
</tr>
<tr>
<td>BMOL 687 Doctoral Preliminary Examination (1 cr.)</td>
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<tr>
<td>BMOL 691 Doctoral Comprehensive Examination (1 cr.)</td>
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<tr>
<td><strong>Culminating Activity</strong></td>
<td>30</td>
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<tr>
<td>BMOL 693 Dissertation (30 cr.)</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td>66</td>
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</table>
**APPROVED ELECTIVES FOR PH.D. IN BIOMOLECULAR SCIENCES**

<table>
<thead>
<tr>
<th>Course Number and Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>BMOL 514 Flow Cytometry Research Techniques (1 cr.)</td>
<td></td>
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<tr>
<td>BMOL 555 Applied Calculus for Biomolecular Sciences (1 cr.)</td>
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<tr>
<td>BMOL 613 Molecular Genetics (3 cr.)</td>
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<tr>
<td>BMOL 615 Research in the Biomolecular Sciences (1 cr.)</td>
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<tr>
<td>BIOCHEM 512 Intermediary Metabolism (3 cr.)</td>
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<tr>
<td>BIOCHEM 513 Advanced Enzymology (3 cr.)</td>
<td></td>
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<td>BIOL 501 Biometry (4 cr.)</td>
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<tr>
<td>BIOL 503 Advanced Biometry (4 cr.)</td>
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<tr>
<td>BIOL 509 Molecular Ecology (3 cr.)</td>
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<td>BIOL 510 Pathogenic Bacteriology (4 cr.)</td>
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<tr>
<td>BIOL 514 Flow Cytometry Research Techniques (1 cr.)</td>
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<tr>
<td>BIOL 520 Immunology (3 cr.)</td>
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<tr>
<td>BIOL 521 Immunology Laboratory (2 cr.)</td>
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<td>BIOL 531 Pharmacology (3 cr.)</td>
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<td>BIOL 539 Vaccinology (3 cr.)</td>
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<tr>
<td>BIOL 540 General and Molecular Toxicology (3 cr.)</td>
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<tr>
<td>BIOL 541 Molecular Biology of Cancer (3 cr.)</td>
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<td>BIOL 542 Molecular Neurobiology (3 cr.)</td>
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<tr>
<td>BIOL 543 Advanced Developmental Biology (2 cr.)</td>
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<td>BIOL 546 Bioinformatics (3 cr.)</td>
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<td>BIOL 547 Forensic Biology (3 cr.)</td>
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<td>BIOL 548 Perl for Bioinformatics (3 cr.)</td>
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<td>BIOL 549 Genomics (3 cr.)</td>
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<td>BIOL 551 Developmental Biology (4 cr.)</td>
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<tr>
<td>BIOL 565 Advanced Topics in Molecular Biology Techniques (1 cr.)</td>
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<tr>
<td>BIOL 566 Adv. Topics in Molecular, Cellular and Developmental Biology (1 cr.)</td>
<td></td>
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<tr>
<td>BIOL 570 Genetic Engineering and Biotechnology (3 cr.)</td>
<td></td>
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<tr>
<td>BIOL 623 Advanced Immunology (1 cr.)</td>
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<tr>
<td>BOT 523 Molecular and Cellular Biology of Plants (3 cr.)</td>
<td></td>
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<td>CHEM 508 Synthetic Organic Chemistry (3 cr.)</td>
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<td>CHEM 509 Introduction to Polymer Chemistry (3 cr.)</td>
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<td>CHEM 510 Organic Polymer Synthesis (3 cr.)</td>
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<td>CHEM 511 Advanced Analytical Chemistry (3 cr.)</td>
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<td>CHEM 521 Quantum Chemistry (3 cr.)</td>
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<td>CHEM 522 Spectroscopy (3 cr.)</td>
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<td>CHEM 523 Chemical Kinetics (3 cr.)</td>
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<td>CHEM 540 Spectrometric Identification (3 cr.)</td>
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<td>CHEM 551 Bioinorganic Chemistry (3 cr.)</td>
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<td>CHEM 560 Introduction to NMR Spectroscopy (2 cr.)</td>
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<tr>
<td>CHEM 561 Intro. Molecular Modeling &amp; Computational Chemistry (2 cr.)</td>
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<td>COMPSCI 510 Databases (4 cr.)</td>
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<td>COMPSCI 521 Design and Analysis of Algorithms (3 cr.)</td>
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<td>COMPSCI 530 Parallel Computing (3 cr.)</td>
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<td>COMPSCI 557 Artificial Intelligence (3 cr.)</td>
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<td>ECE 556 Pattern Recognition (3 cr.)</td>
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<td>MATH 562 Probability and Statistics (4 cr.)</td>
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<td>MATH 572 Computational Statistics (3 cr.)</td>
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<td>MBA 503 Managing Successful Projects: Planning and People (2 cr.)</td>
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<td>PHYS 523 Physical Methods of Materials Characterization (3 cr.)</td>
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<td>PHYS 536 Soft Matter (3 cr.)</td>
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<td>PHYS 507 Molecular and Cellular Biophysics (4 cr.)</td>
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<td>PHYS 520 Nanobiotechnology (3 cr.)</td>
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<td>PHYS 537 Radiation Biophysics (3 cr.)</td>
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<td>PHYS 624 Membrane Biophysics (3 cr.)</td>
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<td>ZOOL 501 Human Physiology (4 cr.)</td>
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<td>ZOOL 502 Human Endocrinology (3 cr.)</td>
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*Up to 2 credits can be from coursework outside of this list except for university wide 696 Directed Research Courses (e.g. BMOL 696) or independent study courses (e.g., BMOL 596) that focus on the learning of research techniques and/or obtaining of data.

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.
APPLYING PRIOR CREDITS TOWARDS DEGREE

Course credit previously earned in a Master’s degree at a regionally accredited US institution or non-US institution approved by the International Admissions Office may apply towards degree requirements with the following restrictions (see Graduate Catalog for University rules and regulations):

- Grade of B or better must be earned
- Cannot represent effort for a graduate culminating activity or experiential learning, or courses based only on attendance
- Cannot be continuing education units
- Limited to no more than one third of the total credit requirement, i.e., 22 credits

These credits must also be approved by the student’s Major Professor and the Director of the Biomolecular Sciences Ph.D. program and a the Graduate College’s “Request for Approval of Transfer Credits” form must be signed by the student, Major Professor, Program Director, and the Graduate Dean. “Application for Admission to Candidacy” form formalizes the transfer credit to be applied to your degree. A “Request for Adjustment of Academic Requirements” form is required to substitute a core course (i.e., courses other than approved electives) with a transfer course.

PRELIMINARY EXAMINATION

The preliminary examination is a series of written examinations that measures achievement by the student of an acceptable breadth and depth of knowledge in biomolecular sciences. Questions are developed by the program faculty, with the focus on material presented in the core sequence as well as PHYS 504 Molecular and Cellular Biophysics and BMOL 511 Advanced Cell Biology. The preliminary examination is offered annually, following the end of the spring semester on dates (typically during the second week of the summer). A student should plan to take the preliminary examination prior to the fifth semester of study once they have attained regular status. The written preliminary exam consists of a series of questions covering topics from the core curriculum (BMOL 601, BMOL 602, BMOL 603) as well as PHYS 504 Molecular and Cellular Biophysics and BMOL 511 Advanced Cell Biology. The questions covering program core courses will be “blended” or interdisciplinary-type questions designed to span the material presented in these three courses. These questions will be collectively written by program faculty, and compiled by the faculty steering committee. The exam will consist of a series of questions in which students must pass a pre-determined number of questions (e.g., 6 out of 9). The preliminary exam is graded as either pass or fail. The Program Director notifies the student of the results of the examination in writing, and any sections that were failed. Once passed, a grade of P is recorded for BMOL 687 Doctoral Preliminary Examination. A preliminary exam that is failed on the first attempt can be repeated once, but only if a second attempt is requested in writing by the student within five working days after the student has received notification of their failure, and if the request is approved by the Program. If the second attempt is disapproved, then the Program Director notifies the Dean of the Graduate College that the student should be administratively withdrawn from the program. If the second attempt is approved, then a grade of “I” is recorded and an Incomplete Contract will be submitted for BMOL 687. The Incomplete Contract will state the portion(s) of the exam that were previously failed,
with the requirement that the Examination must be completed within 3 months after the failed
first attempt. If the student does not make a second attempt within 3 months after the first
attempt, or if the student fails the second attempt, then a grade of (F) is assigned to the BMOL
687 credit and the student is dismissed from the program by the Graduate College. A third
attempt to pass the exam is not permitted. A student who is administratively withdrawn from the
program may apply for admission to another graduate program offered by the university.

MASTER’S EN ROUTE TO PH.D.

Students interested in earning a M.S. degree while pursuing their doctorate, need to see the
Program office.

COMPREHENSIVE EXAMINATION

The comprehensive examination is taken early in the fall semester following successful
completion of the preliminary examination. It assesses the readiness of a student to pursue
doctoral research in the biomolecular sciences. In preparation for the examination, the student
develops a written research proposal on a topic distinct from the student’s anticipated
dissertation research, and submits the proposal to an examining committee the first day of the
semester (typically in the 3rd year of study) by 5:00 pm MST. The examining committee consists
of five members of the program faculty representing all three key departments of biological
sciences, chemistry/biochemistry, and physics. The examining committee excludes the student’s
major advisor. The comprehensive examination requires a private presentation of the proposal by
the student to the examining committee. During and after this presentation, the student answers
questions posed by the committee; questions will be based upon the proposal and scientific
thinking and scientific content related to the proposal. After this question and answer period, the
examining committee will grade the written seminar and the oral defense as pass/fail, or request
an additional session in which the student can address revisions to the proposal and/or the oral
defense of the proposal. If an additional session is held, there will be a required waiting period
before it can be scheduled. At the end of this process, the examining committee determines the
outcome of the comprehensive examination. The Program Director notifies the student of the
results of the examination in writing, and any sections that were failed. Once passed, a grade of
P is recorded for BMOL 687 Doctoral Preliminary Examination. A comprehensive exam that is
failed on the first attempt can be repeated once, but only if a second attempt is requested in
writing by the student within five working days after the student has received notification of
their failure, and if the request is approved by the Program Director. If the second attempt is
disapproved, then the Program Director notifies the Dean of the Graduate College that the
student should be administratively withdrawn from the program. If the second attempt is
approved, the student must retake the portion(s) of the exam that were previously failed, within 3
months after the failed first attempt. If the student does not make a second attempt within 3
months after the first attempt, or if the student fails the second attempt, then a grade of (F) is
assigned to the BMOL 691 credit and the student is dismissed from the program by the Graduate
College. A second attempt to pass the exam will be videotaped. A third attempt to pass the exam
is not permitted. A student who is administratively withdrawn from the program may apply for
admission to another graduate program offered by the university.
ADMISSION TO CANDIDACY

In the third year of study (typically), students are required to 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 http://www.boisestate.edu/gradcoll/0004.html. 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.

The Application for Admission to Candidacy form should be filed as soon as all course requirements are satisfied (or in progress) except the dissertation course (BMOL 693) requirement. 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 preliminary and comprehensive examinations have been passed, and 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.

DISSERTATION REQUIREMENTS

The dissertation must be the result of independent and original research by the student, and must constitute a significant contribution to current knowledge in Biomolecular Sciences, equivalent to multiple peer-reviewed publications. Ideally, the dissertation research should be accepted for publication in peer-reviewed journal(s) prior to the final dissertation defense.

The style and format of the dissertation must conform to the standards of the Graduate College. The dissertation 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.

FINAL ORAL EXAMINATION

The final oral examination consists of a public presentation of the dissertation, followed by a public question and answer session, and an oral defense of the dissertation held in private.
conference with the candidate’s defense committee. Prior to scheduling the final oral examination, research results must be submitted for publication. Once results have been submitted for publication, submit a *Final Oral Examination Permission Form* with signatures obtained from all committee members, confirming that the dissertation has progressed sufficiently to be defended by the proposed date. Members of the defense committee must receive the defense version of the dissertation a minimum of one month in advance of the defense date, unless other arrangements have been approved by the committee. Students are strongly encouraged to schedule their defense during the normal academic year.

A defense committee consists of the supervisory committee, an external examiner and an additional nonvoting graduate faculty representative (GFR) appointed by the Dean of the Graduate College. The GFR will chair the final oral examination in accordance with procedures established by the Graduate College. The external examiner is an expert in the dissertation content who is not affiliated with Boise State University, but is appointed as a voting member of the defense committee by the Dean of the Graduate College. The outcome of the final exam is determined by a majority vote. A tie vote is a fail!

### ADMINISTRATIVE STEPS FOR YOUR DISSERTATION DEFENSE

<table>
<thead>
<tr>
<th>Steps</th>
<th>Description</th>
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<tbody>
<tr>
<td>Meet with your supervisory committee and provide draft of dissertation</td>
<td><strong>A minimum</strong> of two months prior to your anticipated dissertation defense date, meet with your Supervisory Committee to verify that your dissertation is sufficiently well developed to likely be defendable. Establish an anticipated defense date that works for all members of your committee.</td>
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<tr>
<td>Submit “Request for Appointment of External Examiner” form</td>
<td>Two months prior to anticipated defense date, the major advisor submits “<em>Request for Appointment of External Examiner</em>” form to the Graduate College, AND provides a copy to the Biomolecular Sciences PhD Program office.</td>
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<tr>
<td>Submit “Final Oral Examination Permission” form</td>
<td>At least 4 weeks prior to anticipated defense date submit the program form signed by all members of your Supervisory Committee. This ensures that your committee believes your dissertation is ready to defend, and enables you to begin scheduling your defense.</td>
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<tr>
<td>Submit final copy of dissertation</td>
<td>At least one month prior to your anticipated defense date, submit your dissertation to Supervisory Committee and provide a copy to the Graduate College so that it can be sent to the External Examiner. Provide your dissertation to all members of your Supervisory Committee.</td>
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<tr>
<td>Work with the Biomolecular Sciences Program office to schedule your defense (same time)</td>
<td>Inform the program office of the defense dates that your entire supervisory committee is available. The program office will contact External Examiner to determine the defense date, time, and place. Contact the Graduate College so they can appoint a Graduate Faculty Representative.</td>
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<tr>
<td>Submit <a href="#">Graduate Defense Notification form</a></td>
<td>This form is found on the Graduate College webpage.</td>
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<tr>
<td>Distribute Announcement</td>
<td>Work with the program office to ensure that a defense announcement is distributed. This announcement must also be sent to the Graduate College so they can post it on the</td>
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Take to defense | Use template on Graduate College webpage to prepare the Defense Committee Approval page and the Final Reading Approval page. Obtain all signatures at end of defense and promptly return to Program Office for delivery to Graduate College.

*Failure to meet this deadline will require the student to defend the subsequent semester. As a result, you will be required to register for at least one credit of BMOL 693 in the semester you defend.

You will need to submit a signed Final Reading Approval form and a review copy of the dissertation 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 dissertation 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 asked to provide feedback about the program two more times. 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. Approximately two years after graduation we will contact 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 FLOW CYTOMETRY RESEARCH TECHNIQUES (1-0-3) (F/S/SU). This course 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.

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 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. PREREQ: BIOL 310 or equivalent.

BMOL 615 RESEARCH IN THE BIOMOLECULAR SCIENCES (0-3-1) (F). Research conducted by a graduate student under the supervision of faculty in the Biomolecular Sciences area. Students rotate through different research laboratories during the course of a 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/or data interpretation. PREREQ: PERM/INST.

BMOL 687 DOCTORAL PRELIMINARY EXAMINATION (Variable Credit). An early assessment of a student’s potential to complete a doctoral program satisfactorily. Considerable autonomy is granted to the academic unit in the design, administration, and evaluation of the preliminary examination. Pass/fail only.

Written assessments of foundational knowledge gained from the core curriculum, experimental design skills, and ability to interpret and communicate scientific data. Students enroll in this course during the summer semester after completion of their second academic year of study. Examinations will be evaluated by an assembled panel of Biomolecular Sciences program faculty. PREREQ: PERM/INST. The course is graded Pass/Fail, is offered during the summer and is one credit.

BMOL 691 DOCTORAL COMPREHENSIVE EXAMINATION (Variable Credit).
Taken when the doctoral student is in Regular Status and has completed a significant number of course credits applicable to the degree requirements. Considerable autonomy is granted to the academic unit in the design, administration, and evaluation of the comprehensive examination. Pass/fail only.

Students enrolled in this course prepare a research proposal on a topic other than their dissertation work and submit it to an examining committee. An oral defense of the proposal is scheduled during the semester to assess familiarity with the grant topic as well as material covered in core curriculum and prerequisite courses. Successful completion of this course is required for the student to advance to candidacy. PREREQ: PERM/INST. The course is graded Pass/Fail, is offered in the fall, and is one credit.

**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 used in molecular ecology and phylogeography. Molecular genetic markers currently used to study ecological phenomena (e.g., mating systems, parentage and kinship, population structure, gene flow, dispersal, natural selection). Emphasis on a hypothesis-testing approach. Determination of which molecular techniques are most appropriate for specific research questions. PREREQ: BIOL 323 and BIOL 310.

**BIOL 510 PATHOGENIC BACTERIOLOGY (2-6-4)(S)(Odd years).** 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 FLOW CYTOMETRY RESEARCH TECHNIQUES (1-0-3) (F/S/SU). This course 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)(F). Principles of immunology, host defense mechanisms, the immune response, immune disorders, serology, and related topics. PREREQ: BIOL 320 or equivalent.

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.

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 data bases, 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 or PERM/INST.

**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 (3-3-4)(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 and BIOL 320 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 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. 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 310.

**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.

GCOLL 505 RESPONSIBLE CONDUCT IN RESEARCH (1-0-1)(F,S). Basic concepts, principals and practices governing research compliance and Responsible Conduct for Research (RCR) in each of four disciplinary areas (one area chosen by each student): biomedical sciences, social and behavioral sciences, physical sciences and engineering, humanities. Each area includes an overview of research misconduct, data acquisition and management, responsible authorship, peer review, mentoring, conflicts of interest, collaborative research, human subjects and animal research. On-line materials produced by the Collaborative Institutional Training Initiative (CITI). Lectures will cover the on-line materials and related case studies, and other areas of research compliance including patents, intellectual properties, non-disclosure agreements and sponsored projects. PREREQ: Graduate standing.


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.
# SUGGESTED TIMELINE OF STUDENTS IN THE BIOMOLECULAR SCIENCES Ph.D. PROGRAM***

The following table briefly summarizes important dates and activities that students should be cognizant of during the course of their graduate studies.

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>Deadlines*</th>
<th>Activity</th>
</tr>
</thead>
</table>
| 0       | Fall       | Encouraged to contact potential mentors  
Take GRE test/request transcripts/request letters of recommendation  
Jan 10th | Deadline to submit completed application  
Spring | Analysis of graduate student applications  
Late Feb. | Notification of student acceptance into the program  
Mid-Mar. | Student “Preview Weekend” (by invitation)  
April 15th | Earliest date to register for fall semester courses  
1       | Summer (~Aug. 14th) | Assignment of duties for graduate assistants  
Fall | New student orientation and TA training  
| | Begin coursework  
| | Enroll in BMOL 598, BMOL 601, BMOL 605, BMOL 615, BMOL 616, and other courses  
| | Submit transfer credit request as needed  
Spring | Enroll in BMOL 602, BMOL 598, BMOL 555, and other courses  
May 15th | Complete Graduate Student Annual Review form with major advisor or program director if advisor not chosen yet  
| | Formal selection of major advisor (by end of 1st year)**  
2       | Fall | Submit Appointment of Supervisory Committee form**  
| | Prepare and submit Academic Checklist**  
| | Meet with Supervisory Committee**  
| | Enroll in BMOL 598, BMOL 605, BMOL 603, BMOL 606  
Spring | Enroll in BMOL 598 and other courses per degree plan  
May 15th | Submit Graduate Student Annual Review form  
| | Signup for summer enrollment for BMOL 687 [preliminary exam] and fall enrollment for BMOL 691 [comprehensive exam]  
Summer | Take written preliminary examination (BMOL 687) by (2nd week of summer)  
3       | Fall | Enroll in any remaining coursework  
| | Attend BMOL 598  
| | Submit written proposal by first day of fall semester (distinct from dissertation research) to examining committee  
| | Take comprehensive examination (BMOL 691)  
Spring | Attend BMOL 598 and enroll in BMOL 607  
May 15th | Submit Graduate Student Annual Review form  
| | Submit Application for Admission to Candidacy  
4 +     | Fall & | Attend BMOL 598  
| | Spring | Complete/submit Graduate Student Annual Review form  
| | Submit Final Oral Examination Permission form (at least one month prior to projected dissertation defense date)  

* Estimated dates, check yearly academic calendar for specific dates  
** These forms or activities may be submitted/completed as early as the first semester of study  
*** Students are strongly encouraged to work with an advisor – this document is not comprehensive
### Milestones

<table>
<thead>
<tr>
<th>Programmatic “Nuts and Bolts”</th>
<th>Semester</th>
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<tbody>
<tr>
<td>Identify faculty for lab rotations</td>
<td>Pre-</td>
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<tr>
<td>Program orientation</td>
<td>x</td>
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<tr>
<td>Meet with program director</td>
<td>x</td>
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<tr>
<td>Complete BMOL 616</td>
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<td>Identify major professor</td>
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<td>Identify initial research specific aims</td>
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<td>Submit appointment of supervisory committee form</td>
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<tr>
<td>Assemble supervisory committee</td>
<td>x</td>
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<tr>
<td>Receive mentoring on courses to take</td>
<td>x</td>
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<tr>
<td>Submit academic checklist</td>
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<tr>
<td>Complete annual grad student review</td>
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### Towards Candidacy

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<tr>
<th>Complete BMOL core courses</th>
<th>Pre-</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
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<tbody>
<tr>
<td>Enroll in BMOL 605</td>
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<td>Complete proposal writing course (BMOL 606)</td>
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<td>Begin writing 2nd proposal</td>
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<td>Written prelim exam (in summer)</td>
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<td>Submit 2nd proposal to committee</td>
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<tr>
<td>Oral exam</td>
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<tr>
<td>Complete any remaining coursework</td>
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<td>Apply for admission to candidacy</td>
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### Post-Candidacy

| Complete dissertation research | During this period | | | | | | | | | | |
| Present in BMOL 607 | x | | | | | | | | | | |
| Write dissertation | During this period | | | | | | | | | | |
| Schedule and defend dissertation | During this period | | | | | | | | | | |

### 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.
When you enter into the Biomolecular Sciences Ph.D. 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 polices are outlined in this handbook, the Boise State University Student Handbook at [http://vpsa.boisestate.edu/](http://vpsa.boisestate.edu/), Boise State University Policies at [http://policy.boisestate.edu/](http://policy.boisestate.edu/), Student Code of Conduct, Graduate Catalog, and Standards and Guidelines for Dissertations.

Academic Dishonesty (plagiarism/cheating) will not be tolerated. Please refer to the university website ([www2.boisestate.edu/studentconduct/studentcodeofconduct.htm](http://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. 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/](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](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/](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/

TRAVEL GRANTS

The program supports travel to students in good standing by providing up to $1000 per trip for attendance at two scientific meetings. Travel requests should be directed to the Program Director and must be accompanied by proof of presentation at the scientific meeting (e.g., acceptance of poster presentation, seminar, etc.). The major professor should indicate their support of the student’s travel and whether they are able to cover any additional incurred travel costs.

For other travel funding opportunities, go to the Scholarships and Funding section on the Program website, biomolecularsciences.boisestate.edu

GRADUATE COLLEGE AND PROGRAM FORMS

- Request for Approval of Transfer Credits
- Academic Adjustment
- Admission to Candidacy
- Appointment of Supervisory Committee
- Access Agreement for a Thesis or Dissertation
- Defense Committee Approval (dissertation)
Defense Notification
Final Reading Approval (dissertation)
Approval Page for Electronic Copy (dissertation)
Request for External Examiner (Completed by Major Advisor/Committee Chair)

For selected program forms, see back of this handbook.
PH.D. FACULTY ADVISOR ACCEPTANCE FORM

for

Student Name (printed): ______________________________

The purpose of this form is to document the mutual agreement of the undersigned faculty member to serve as the major advisor for the named biomolecular sciences graduate student.

Obligations of the graduate student include regular meetings with their major advisor to discuss expected workload (e.g., hours, schedule), research expectations, and research progress. Outside employment is not allowed for any graduate student in the Biomolecular Sciences PhD Program. An appeals process exists for special circumstances. Students must adhere to the university’s code of conduct for both students and employees, as well as expectations outlined in the student’s program handbook.

Obligations of the faculty advisor include providing the student with clear work expectations, regular feedback regarding research progress, and completing annual written student progress reviews that accurately reflect student progress and/or shortcomings. If student improvement is needed in any area, faculty should consult with the program to develop a formal performance improvement plan. Faculty mentors also agree to promptly report any student violations of the university’s codes of conduct (both student and employee) to the program, and to not authorize outside employment for the student without petitioning to the program. By signing, faculty agree to the above stipulations and, for PhD students only, acknowledge their expectation to obtain funding to support the student’s tuition, fees, and standard stipend once the 3 years of program support has been used.

Student Signature: _____________________________     Date: _______________________

Dissertation Advisor Signature: ___________________      Date:_______________________

Dissertation Advisor Print: _______________________      Date: _______________________

Director of Graduate Studies Signature: _______________________   Date: ______________
ACADEMIC CHECKLIST FOR DOCTORATE IN BIOMOLECULAR SCIENCES

(This form should be presented at the initial supervisory committee meeting. After it is signed, please submit it to the Program Director.)

Name of Student___________________________ Degree Sought__________________________
Previous institutions, degree(s) and dates awarded_______________________________________

A. Prerequisite Coursework or equivalent (list course name, institution, and grade)
   Cell Biology (BIOL 320)__________________________________________
   Biochemistry (CHEM 431) or CHEM 350 plus PHYS 307_______________________
   Calculus I (MATH 170)______________________________________________
   Physics (PHYS 112)___________________________________________________

B. Required Coursework      Proposed Date
   BMOL 601 - Biomolecules I    4 credits_____________________
   BMOL 602 - Biomolecules II    4 credits_____________________
   BMOL 603 - Biophysical Instrumentation 4 credits_____________________
   BMOL 605 - Current Scientific Literature  2 credits total___________
   BMOL 606 - Proposal Writing  2 credits__________________________
   BMOL 607 - Graduate Research Presentation  1 credit ________________
   BMOL 598 - Graduate Seminar  4 credits total____________________
   BIOL 511 - Advanced Cell Biology  3 credits______________________
   BMOL 516 - Responsible Conduct Research  1 credit ________________
   PHYS 507 - Molecular and Cellular Biophysics 4 credits______________
   ____________________Elective from approved list _______________________
   ____________________Elective from approved list _______________________
   ____________________Elective from approved list _______________________
   ____________________Elective from approved list _______________________
   ____________________Elective from approved list _______________________
   ____________________Elective (to total 5 cr.) __________________________

C. Committee Member Signatures:
   Major Advisor:_________________________________ Date:_______________
   Committee Member:_____________________________ Date:_______________
   Committee Member:_____________________________ Date:_______________
   Committee Member:_____________________________ Date:_______________
   Committee Member:_____________________________ Date:_______________

*a substantial deviation from this form should be re-approved by supervisory committee

D. Date Program of Study Approved:_____________________ Director Initials:   __________
FINAL ORAL EXAMINATION PERMISSION FORM

Before a final oral examination (dissertation defense) date can be formally set, graduate students must obtain signatures from all members of their dissertation supervisory committee indicating that the dissertation has progressed sufficiently to be defended by the proposed date.

Steps to follow:

1. The Major Professor must sign this form indicating the reviewed dissertation and it is of sufficient quality to merit review by other committee members of the supervisory committee.

2. The student must provide the supervisory committee with a defense version of the dissertation and a copy of this form signed by the Major Professor.

3. Once the form is signed by the committee members, indicating defense may proceed; the form is to be returned to program administration; If this form is not approved by the committee members, the defense will be canceled.

4. Once permission is granted the student will submit the defense version of the dissertation to the Graduate College, supervisory committee, and program administration. The student will then work with program administration to schedule the defense date, which will typically occur 4 weeks after the dissertation is forwarded to the Graduate College.

Student’s Name:_____________________________________

Proposed examination date:____________________________

It is highly recommended that students schedule their defense during the academic year.

Has your research been submitted for publication? ___yes ___no

if so, in what journal(s) and when? ____________________________

Committee Signatures

Major Advisor:_________________________ Date:______________

Committee Member:_________________________ Date:______________

Committee Member:_________________________ Date:______________

Committee Member:_________________________ Date:______________

Committee Member:_________________________ Date:______________
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>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work</td>
<td></td>
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</tr>
<tr>
<td>❃ Timeliness</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>
<td></td>
</tr>
<tr>
<td>☑ GA FA</td>
<td>☑ GA FA</td>
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<tr>
<td>☑ Completeness</td>
<td>☐ ☐ Consistently delivers complete work</td>
<td>☐ ☐ Sometimes delivers complete work</td>
<td>☐ ☐ Rarely or never delivers complete work</td>
<td>☑ GA FA</td>
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<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>
<td>☑ GA FA</td>
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<tr>
<td>☃ Clarifies expectations when needed</td>
<td>☐ ☐ Consistently clarifies expectations if performance criteria are</td>
<td>☐ ☐ Sometimes clarifies expectations if performance criteria are</td>
<td>☐ ☐ Rarely or never clarifies expectations if performance criteria are</td>
<td>☑ GA FA</td>
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<tr>
<td>Category</td>
<td>Competent</td>
<td>Developing</td>
<td>Unsatisfactory</td>
<td>NA</td>
</tr>
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<td>-------------------------------</td>
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<td>--------------------------------------------------------------</td>
<td>-----------------------------------------------------</td>
<td>----</td>
</tr>
<tr>
<td>Demeanor</td>
<td>G A F A Consistently demonstrates a positive attitude toward work</td>
<td>G A F A Sometimes demonstrates a positive attitude toward work</td>
<td>G A F A Rarely or never demonstrates a positive attitude toward work</td>
<td>G A F A</td>
</tr>
<tr>
<td>Willingness to learn</td>
<td>G A F A Consistently willing to take on tasks outside their comfort zone</td>
<td>G A F A Rarely willing to take on tasks outside their comfort zone</td>
<td>G A F A Never willing to take on tasks outside their comfort zone</td>
<td>G A F A</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>G A F A Consistently dedicated to doing a good job</td>
<td>G A F A Inconsistently dedicated to doing a good job</td>
<td>G A F A Rarely dedicated to doing a good job</td>
<td>G A F A</td>
</tr>
<tr>
<td>Teamwork</td>
<td>G A F A Consistently displays an ability and willingness to work well with others, when appropriate, to complete assigned tasks regardless of role</td>
<td>G A F A Inconsistently displays an ability or willingness to work well with others to complete assigned tasks regardless of role</td>
<td>G A F A Rarely or never displays an ability or willingness to work well with others to complete assigned tasks regardless of role</td>
<td>G A F A</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>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</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 Comments:
(Option)

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.