

2018–2019

Graduate Handbook

Biomedical Sciences Graduate Program

Department of Biomedical Sciences,
University of North Dakota, School of
Medicine and Health Sciences

Department Home Page

<https://med.und.edu/biomedical-sciences/index.html>

TABLE OF CONTENTS

WELCOME LETTER	3
UNIVERSITY RESOURCES	4
2018-2019 ACADEMIC CALENDAR	5
GENERAL GUIDELINES FOR GRADUATE STUDIES	6
PROGRAM DESCRIPTION	6
PROFESSIONAL DEVELOPMENT	6
PROFESSIONALISM	7
MASTER'S PROGRAM: MISSION, GOALS AND OBJECTIVES	8
DOCTORATE PROGRAM: MISSION, GOALS AND OBJECTIVES	8-9
MASTER OF SCIENCE DEGREE REQUIREMENTS	10
CURRICULUM FOR MASTER'S DEGREE	11
DOCTORAL DEGREE REQUIREMENTS	12
BASIC CURRICULUM FOR DOCTORAL DEGREE	13
MICROBIOLOGY AND IMMUNOLOGY SUB-PLAN	14
NEUROSCIENCE SUB-PLAN	15
STUDENT TEACHING GUIDELINES	16
ELECTIVE COURSES (BIOMEDICAL SCIENCES)	17-19
FACULTY RECOMMENDED TEXTBOOKS	19-20
ASSESSMENT OF STUDENT PROGRESS	20
ANNUAL STUDENT REPORTING	20-21
LABORATORY ROTATIONS AND ADVISOR SELECTION	22
COMPREHENSIVE EXAMINATION GUIDELINES	23
LEAVE OF ABSENCE GUIDELINES	24-26
FORMS AND EVALUATION DUE DATES	26-27

WELCOME

I would like to take this opportunity to welcome you to our graduate program within the Department of Biomedical Sciences here at the University of North Dakota in the School of Medicine and Health Sciences. We are very excited that you chose to join our program for your graduate studies. In as much, we will make every effort to make this a beneficial and enjoyable experience while you are here on campus. To help you get better acquainted with our program I am sending you this handbook that describes Departmental and University policies of importance with regards to our MS and PhD programs. I understand that the handbook may raise more questions than answers, but rest assured we will go over these guidelines during orientation week.

While every attempt has been made to ensure that the policies described in this handbook are accurate, it is important to understand that the UND School of Graduate Studies (<http://graduateschool.und.edu/>) will have the most up-to-date information on regulations and requirements for the graduate program and graduation. This handbook should be used as a resource for program guidelines and specific program information, but not as a substitute for the advising and counseling functions of your individual research supervisor, the Graduate Director and the UND School of Graduate Studies.

It is our hope that you will have a rewarding academic experience here at UND, and we are committed to helping you achieve your career goals. If you have any questions, feel free to contact me by phone or email.

Sincerely,

Thad A. Rosenberger, Ph.D.

Associate Professor in the Department of Biomedical Sciences
University of North Dakota, School of Medicine and Health Sciences
504 Hamline Street, Room 122, Stop 9061
Grand Forks, North Dakota 58203

Director of Graduate Program in Biomedical Sciences
Senior Associate Editor for Lipids, A Journal of the American Oil Chemists' Society

Office: (701) 777-0591

Lab: (701) 777-0590

Email: thad.rosenberger@med.und.edu

UNIVERSITY RESOURCES

UND, School of Graduate Studies

<http://graduateschool.und.edu/>

Twamley Hall, Room 105
264 Centennial Drive, Stop 8178
Grand Forks, ND 58202
Toll Free: 1-800-Call-UND
Local: 701-777-2784

Office of International Programs

<http://und.edu/academics/international-center/prospective-students/index.cfm>

Memorial Union, Room 261
Phone: +1-701-777-4231
International Centre
2901 University Avenue, Stop 7109
Grand Forks, ND 58202-7109
United States of America

UND Student Financial Aid Office

<http://und.edu/admissions/financial-aid/index.cfm>

Twamley Hall, Room 216
Tel: 701-777-1234
FAX: 701-777-2040
264 Centennial Drive Stop 8371
Grand Forks, ND 58202-8371

Student Health Services

<http://und.edu/health-wellness/student-health/>

McCannel Hall, Room 100.
Phone: 701-777-4500
2891 2nd Ave N Stop 9038
Grand Forks, ND 58202-9038

SMHS Wellness Advocate

Michelle Montgomery, MSW
School of Medicine and Health Sciences, Room E272
Phone: 701-777-5485
1301 N Columbia Road Stop 9037
Grand Forks, ND 58202-9037

Academic Calendar 2018-2019* (Subject to Change)

FALL SEMESTER	2018-2019 (1910)
Beginning of instruction, 4 p.m	August 20
Last day for advancement to candidacy for all Graduate students planning to graduate in December	August 31
Last day to add a full-term course or drop without record	August 29
Last day to change to or from audit grading for a full-term course	August 29
Holiday, Labor Day	September 3
Last day for students to submit incomplete work from Spring and Summer to instructors or petition for extension of incomplete	September 14
Last day undergraduate candidates may apply for a degree	September 18
Last day graduate candidates may apply for a degree	September 21
Last day for instructors to turn in Removal of Incomplete Grade form to the Registrar's Office	September 28
Last day to drop a full-term course or withdraw from school	November 9
Last day to change to or from S/U grading for a full-term course	November 9
Holiday, Veterans Day	November 12
Last day to submit Thesis/Dissertation "Preliminary Approval", "Notice of Defense", to the School of Graduate Studies office	November 15
Thanksgiving recess	November 22-23
Last day for Thesis/Dissertation Defense	November 29
Last day for faculty to submit "Final Report on Candidate" form to the School of Graduate Studies office	December 6
Last day to submit final copy of electronic Thesis/Dissertation for publishing	December 6
Reading and Review Day	December 7
Semester examination period	December 10-14
Winter Commencement, Graduate and Professional Ceremony	December 13
Winter Commencement and Official Graduation Day	December 14
Grades due from faculty to the Registrar's Office at noon CST	December 18
SPRING SEMESTER	2018-2019 (1930)
Beginning of instruction, 4 p.m.	January 7
Last day to add a full-term course or drop without record	January 17
Last day to change to or from audit grading for a full-term course	January 17
Last day for advancement to candidacy for all Graduate students planning to graduate in May	January 18
Holiday, Martin Luther King Jr. Day	January 21
Last day for students to submit incomplete work from Fall to instructors or petition for extension of incomplete	February 2
Last day undergraduate candidates may apply for a degree	February 5
Last day graduate candidates may apply for a degree	February 8
Last Day for instructors to turn in Removal of Incomplete Grade form to the Registrar's Office	February 15
Holiday, Presidents' Day	February 18
Spring recess	March 11-15
Holiday	April 19-22
Last day to drop a full-term course or withdraw from school	April 5
Last day to change to or from S/U grading for a full-term course	April 5
Last day to submit Thesis/Dissertation "Preliminary Approval", "Notice of Defense", to the School of Graduate Studies office	April 11
Last day for Thesis/Dissertation Defense	April 26
Last day for faculty to submit "Final Report on Candidate" form to the School of Graduate Studies office	May 2
Last day to submit final copy of electronic Thesis/Dissertation for publishing	May 2
Reading and Review Day	May 3
Semester examination period	May 6-10
Spring Commencement and Official Graduation Day	May 11
Grades due from faculty to the Registrar's Office at noon CST	May 14
SUMMER SESSION	2018-2019 (1940)
Beginning of instruction	May 13
Last day for advancement to candidacy for all Graduate students planning to graduate in August	May 24
Last day to add a full-term course or drop without record	May 20
Last day to change to or from audit grading for a full-term course	May 20
Holiday, Memorial Day	May 27
Last day undergraduate candidates may apply for a degree	June 4
Last day graduate candidates may apply for a degree	June 14
Holiday, Independence Day	July 4
Last day to submit Thesis/Dissertation "Preliminary Approval", "Notice of Defense", to the School of Graduate Studies office	July 5
Last day to drop a full-term course or withdraw from school	July 12
Last day to change to or from S/U grading for a full-term course	July 12
Last day for Thesis/Dissertation Defense	July 19
Last day for faculty to submit "Final Report on Candidate" form to the School of Graduate Studies office	July 25
Last day to submit final copy of electronic Thesis/Dissertation for publishing	July 25
Semester examination period	August 2
Summer Commencement and Official Graduation Day	August 2
Grades due from faculty to the Registrar's Office at noon CST	August 6

*All academic deadline dates apply to full-term, on-campus courses

GENERAL GUIDELINES FOR GRADUATE STUDENTS

1. Graduate students are normally provided with a stipend for work within the Program in the form of graduate research or teaching assistantship. Continued financial assistance is dependent on acceptable performance in research, teaching, and academics as demonstrated by annual reviews.
2. Each graduate student is required to participate in teaching activities during their tenure as graduate students in the Program. The specific teaching activities will be determined in accordance with the needs of the Department in meeting its educational mission. Teaching is an important part of graduate education. Therefore, teaching excellence and professionalism are expected from students in the Program.
3. Every graduate student is required to present a research seminar each academic year, beginning in the fall semester of Year 2, until completion of their degree. A meeting of the Student Advisory Committee normally will follow research seminars.
4. Graduate school is considered a full time job. Although no record of hours worked is required, it is unlikely that a 40-hour work week will be sufficient to be successful in graduate school and your future scientific career.
5. Seminars and journal clubs are an important part of the academic experience. Graduate students are expected to attend seminars and journal clubs, to be on time for such meetings, and to behave in a professional manner.
6. Graduate school is the beginning of your professional career. Therefore, professional conduct is expected of all graduate students in the Program.

PROGRAM DESCRIPTION

The Biomedical Sciences Graduate Program at the University of North Dakota School of Medicine and Health Sciences emphasizes applied research and scholarship in the biomedical sciences. Research and educational opportunities within the program provide students with focused training in multiple fields including Inflammation and Infectious Disease, Neuroscience, or Molecular and Cellular Biology.

The goal of our graduate program is to educate students in a rigorous and challenging environment that fosters creativity, innovation and discovery. MS, PhD, and MD/PhD degrees are offered which can be customized to the career goals of the individual student.

PROFESSIONAL DEVELOPMENT

Success in graduate school and career requires that you create a plan, take advantage of resources and opportunities to develop skills, and explore career resources and alternatives. The first step in the process is to develop an Individual Development Plan (IDP) focusing on your immediate and long-term career objective, discuss these objectives with your academic advisor, then maintain “on file” a continually evolving IDP with the Graduate Director. Secondly, there are many local resource opportunities to facilitate your professional development including our Biomedical Graduate Student Organization (BGSA), North Dakota Academy of Sciences, and opportunities to serve on Medical School and Department committees. Other local professional development activities include participation in our Frank Low Research Day Conference, our Annual Graduate Student Retreat, the School of Graduate Studies sponsored GRAD conference, annual three-minute-thesis competitions, student teaching opportunities, and University and Local support for travel to national and international scientific conferences. Other professional development opportunities include active engagement in national and international professional societies, local, private, and national fellowship competitions, and dissemination of ideas through peer- and non-peer reviewed publication. The Graduate Program encourages all students to engage in as many professional development activities as is possible and places an emphasis on supporting local professional development activities and publication.

PROFESSIONALISM

The Biomedical Sciences Graduate Program at the University of North Dakota School of Medicine and Health Sciences recognizes that while knowledge and technical skills are crucial in a biomedical science career, the manner in which they are used is equally important. In addition to competence in their field, all biomedical professionals must strive to develop and retain those qualities that constitute the essence of professionalism. The core of professionalism includes the attributes of commitment to excellence, honesty and integrity, compassion, respect for others, and professional responsibility. These qualities apply to all aspects of professional life including interactions with colleagues and coworkers.

Below you will find example of behaviors that can serve as **indicators of professionalism**. Although not exhaustive, the following list provides guidance for students and all those responsible for their education.

Commitment to excellence

- Strives to exceed expectations at all times;
- Commits to life-long learning by taking responsibility for one's own learning and accurately reflecting on the adequacy of one's knowledge, skill development, and personal barriers to accomplishing learning and growth;
- Takes responsibility for learning in group settings by being present, prepared, and engaged;
- Strives for mastery of learning appropriate for one's level of training;
- Reflects with colleagues on the success of group work.

Honesty and integrity

- Communicates appropriately in an honest and timely manner;
- Accurately represents actions and events;
- Avoids cheating, plagiarism, fabrication, falsification, misrepresentation of the truth;
- Reflects on one's personal reaction to encounters with others and accepts responsibility for personal actions;
- Recognizes, appropriately discloses, and manages conflicts of interest;
- Is forthcoming with information, does not withhold and/or use information for power;
- Admits mistakes.

Compassion

- Recognizes and responds to the fears and anxieties of others including colleagues;
- Assists colleagues in dealing with the challenges of professional work.

Respect for others

- Recognizes and respects personal and sexual boundaries;
- Avoids bias (e.g. gender, race, age, sexual orientation) in interactions with others;
- Articulates and embraces the many positive aspects of difference among people and demonstrates awareness of how such differences affect personal interactions;
- Demonstrates a commitment to resolving conflicts in a collegial manner;
- Shows sensitivity and respect for the needs, feelings, ideas, and wishes of others in professional and educational settings;
- Demonstrates humility in interactions with others;
- Recognizes that appropriate dress and appearance demonstrate respect for others and for the profession.

Professional responsibility

- Is present and punctual for scheduled activities;
- Takes responsibility to notify others for unavoidable absence or tardiness;
- Copes with the challenges, conflicts, and ambiguities inherent in professional work;
- Identifies and appropriately deals with problematic behaviors of oneself and colleagues;
- Adheres to established professional codes of conduct;
- Identifies ethical issues in professional situations and acts in an ethical manner.

MS PROGRAM MISSION STATEMENT

The mission of the Biomedical Sciences Graduate Program leading to the Master of Science degree is to prepare students for careers in education or technical careers in biomedical sciences.

MS PROGRAM GOALS AND OBJECTIVES

Goal 1: Students will possess and be capable of applying knowledge in biomedical sciences related to their field of study.

Objective 1.1: Students will demonstrate a breadth of knowledge in the biomedical sciences to support scholarly inquiry and flexibility in their career path.

Objective 1.2: Students will demonstrate a depth of knowledge in elected subject areas through scholarly contribution to their field of study.

Objective 1.3: Students will demonstrate skills in the use of technology to manage information.

Objective 1.4: Students will demonstrate the ability to use primary literature and other resources to support their scholarly efforts.

Goal 2: Students will demonstrate the ability to understand, develop, and apply multiple approaches to test ideas using the scientific method.

Objective 2.1: Students will be able to apply the scientific method to conduct a scholarly investigation.

Objective 2.2: Students will demonstrate an ability to formulate questions and generate hypotheses in response to new and unfamiliar problems.

Objective 2.3: Students will demonstrate an ability to implement experimental approaches that have been appropriately chosen to test their hypotheses.

Objective 2.4: Students will demonstrate the ability to appropriately and accurately collect, record, and analyze research data.

Objective 2.5: Students will demonstrate the ability to reach scientifically sound conclusions based on current knowledge within their field of study.

Goal 3: Students will master communication skills necessary to convey the results of their scholarly work.

Objective 3.1: Students will demonstrate the ability to present their research clearly, concisely, and accurately in both oral and written form to experts in the field and to the general scientific community.

Objective 3.2: Students will demonstrate the ability to effectively communicate their scholarly work to a lay audience in a way that illustrates the accomplishments and importance of scientific research.

Goal 4: Students will recognize and abide by professional and ethical standards and participate in service to their institution, the scientific community, and society in general.

Objective 4.1: Students will demonstrate the ability to establish rapport with colleagues and peers that encourages a team-based mindset toward the accomplishment of departmental and institutional goals.

Objective 4.2: Students will demonstrate the ability to articulate and abide by the standards of ethical behavior and responsible conduct in research.

Objective 4.3: Students will demonstrate the ability to articulate and abide by the acceptable standards of conduct in the teacher-learner relationship.

Objective 4.4: Students will engage in ongoing service to the department, the school, the university, the profession, and the community.

PhD PROGRAM MISSION STATEMENT

The mission of the Biomedical Sciences Graduate Program leading to the Doctor of Philosophy degree is to prepare students for professional careers in biomedical sciences through personalized and multi-disciplinary graduate education and research experiences.

PHD PROGRAM GOALS AND OBJECTIVES

Goal 1: Students will become professionals who possess a foundational knowledge of the biomedical sciences and are capable of applying that knowledge in scholarly endeavors as self-directed, life-long learners.

Objective 1.1: Students will demonstrate breadth of knowledge in the biomedical sciences to form a solid basis for scholarly inquiry and flexibility in their career path.

Objective 1.2: Students will demonstrate depth and integration of knowledge in specific subject areas of their choice to support their research and to allow them to make meaningful contributions that advance the discipline.

Objective 1.3: Students will demonstrate skills in managing information and searching the biomedical literature and data repositories using appropriate technology.

Objective 1.4: Students will remain current in their knowledge of major scientific developments and apply this knowledge to multi-disciplinary problems.

Goal 2: Students will become professionals who demonstrate intellectual curiosity and the ability to conduct meaningful scholarly inquiry.

Objective 2.1: Students will demonstrate the ability to develop clearly stated meaningful hypotheses and research questions that lead to scientific investigation in areas relevant to the biomedical sciences.

Objective 2.2: Students will demonstrate the ability to select, design, and implement experimental approaches to rigorously test their hypotheses.

Objective 2.3: Students will demonstrate the ability to appropriately and accurately record and to analyze data with the degree of rigor expected by the scientific community.

Objective 2.4: Students will demonstrate the ability to reach scientifically sound conclusions by integrating their data with existing knowledge and by critical evaluation of their results.

Objective 2.5: Students will disseminate their findings through peer-reviewed publications and other means that advance knowledge in their discipline.

Goal 3: Students will master communication skills necessary to convey the results of their scholarly work.

Objective 3.1: Students will demonstrate the ability to present their research clearly, concisely, and accurately in both oral and written form to experts in the field and to the general scientific community.

Objective 3.2: Students will demonstrate the ability to effectively communicate their scholarly work to a lay audience in a way that illustrates the accomplishments and importance of scientific research.

Goal 4: Students will gain experience in education and mentorship.

Objective 4.1: Students will demonstrate the ability to teach biomedical science to a precollege, undergraduate, graduate, or health professional audience.

Objective 4.2: Students will demonstrate the ability to provide formative and summative feedback that encourages, assesses, and improves learning.

Objective 4.3: Students will demonstrate the principles of effective mentorship.

Goal 5: Students will recognize and abide by professional and ethical standards and participate in service to their institution, the scientific community, and society in general.

Objective 5.1: Students will demonstrate the ability to establish rapport with colleagues and peers that encourages a team-based mindset toward the accomplishment of departmental and institutional goals.

Objective 5.2: Students will demonstrate the ability to articulate and abide by the standards of ethical behavior and responsible conduct in research.

Objective 5.3: Students will demonstrate the ability to articulate and abide by the acceptable standards of conduct in the teacher-learner relationship.

Objective 5.4: Students will engage in ongoing service to the department, the school, the university, the profession, and the community.

MASTER OF SCIENCE DEGREE REQUIREMENTS

Students seeking the Master of Science degree in the Biomedical Sciences Graduate Program must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Biomedical Sciences Graduate Program. In addition to course work, the MS degree requires completion of an acceptable thesis in a program of study designed by the student with Faculty Advisory Committee approval.

1. A minimum of 30 credit hours of graduate level courses including research and thesis.
2. Completion of the following core graduate courses:
 - a. BIMD 501 – Scientific Discovery I - 6 credits
 - b. BIMD 510 – Basic Biomedical Statistics – 2 credits*
 - c. BIMD 516 – Responsible Conduct in Research – 2 credits
 - d. BIMD 590 – Research – at least 8 credits
 - e. BIMD 998 – Thesis – 4 credits*BIMD 510 – Basic Biomedical Statistics fulfills the scholarly tool requirement.
3. Completion of a minimum of 4 credit hours of graduate level elective courses.
4. A student must obtain at least a “B” in all required courses in order to remain in good standing in the graduate program. If less than a “B” is received, the student will be given the opportunity to remediate in a manner determined by the course director. If remediation is unsuccessful, the student may petition the Graduate Faculty to take the course a second time. In the event that the student is unable to raise the grade to at least a “B”, the student must petition the Graduate Faculty to be allowed to remain the program.
- 5.
6. Students must maintain a minimum 3.0 GPA in accordance with School of Graduate Studies guidelines (UND Graduate and Undergraduate Academic Catalog).

In addition to course work, the Master of Science degree requires completion of a thesis based scholarly project completed by the graduate student under the guidance of a faculty advisor. It is expected that the results of the scholarly work will be publishable in a peer-reviewed journal.

MASTER'S CURRICULUM (BASIC)

Year 1	Minimum credits		Credits
Fall	8	BIMD 501 Scientific Discovery	6
		BIMD 516 Responsible Conduct in Research	2
Spring	8	BIMD 502 Scientific Discovery II	6
		BIMD 510 Basic Biomedical Statistics	2
Summer	3	BIMD 590	3
Throughout Year		3 Laboratory Rotations	
		Journal Club	
Total credits			19

Year 2	Minimum credits		Credits
Fall	6	BIMD Elective(s)	0-4
		BIMD590: Research	0-6
Spring	6	BIMD Elective(s)	0-4
		BIMD590: Research	0-6
Summer	3-6	BIMD590: Research	3-6
Throughout Year		Research Seminars (Faculty and Student)	
		Journal Club	
Total Credits			15-18

Years 3-4	Minimum credits		Credits
Fall	6	BIMD590: Research	6
Spring	6	BIMD590 and/or 598: Research and/or Thesis	6
Summer	3-6	BIMD590 and/or 598: Research and/or Thesis	3-6
Throughout year		Research Seminars (Faculty and Student)	
		Journal Club	
		Teaching requirement (See Note Below)	
Total credits			15-18
Total credits needed for degree			≥30

Note: Teaching requirement can be completed once required elective courses are complete

DOCTORAL DEGREE REQUIREMENTS

Students seeking the PhD degree in the Biomedical Sciences Graduate Program must satisfy all general requirements set forth by the School of Graduate Studies as well as particular requirements set forth by the Biomedical Sciences Graduate Program. In addition to course work, the PhD degree requires completion of an acceptable dissertation in a program of study designed by the student with Faculty Advisory Committee approval.

1. A minimum of 90 credit hours of graduate level courses including research and dissertation.
2. Completion of the following graduate level courses:
 - a. BIMD 501 – Scientific Discovery I - 6 credits
 - b. BIMD 502 – Scientific Discovery II - 6 credits
 - c. BIMD 510 – Basic Biomedical Statistics – 2 credits*
 - d. BIMD 516 – Responsible Conduct in Research – 2 credits
 - e. BIMD 518 – Grant Writing – 2 credits
 - f. BIMD 590 – Research – at least 50 credits
 - g. BIMD 999 – Dissertation – 6 credits*BIMD 510 – Basic Biomedical Statistics fulfills the scholarly tool requirement.
3. Completion of a minimum of 6 credit hours of graduate level elective courses.
4. A student must obtain at least a “B” in all required courses in order to remain in good standing in the graduate program. If less than a “B” is received, the student will be given the opportunity to remediate in a manner determined by the course director. If remediation is unsuccessful, the student may petition the Graduate Faculty to take the course a second time. In the event that the student is unable to raise the grade to at least a “B”, the student must petition the Graduate Faculty to be allowed to remain the program.
5. Students must maintain a minimum 3.0 GPA in accordance with School of Graduate Studies guidelines (UND Graduate and Undergraduate Academic Catalog).
6. Students must successfully complete the comprehensive examination.
7. Students must fulfill the teaching requirement as defined by the student’s Faculty Advisory Committee.
8. Research and Dissertation: The PhD degree requires completion of a dissertation based on the results of a project completed by the graduate student under the guidance of a faculty advisor. The project must represent an original and independent investigation by the student. It is expected that the student will publish at least one first author peer-reviewed manuscript in a scientific or academic journal prior to the defense of their dissertation. The dissertation prepared by the candidate must be presented orally in a public forum and defended before the Faculty Advisory Committee and the Departmental Graduate Faculty and will be open to all members of the academic community.

PhD CURRICULUM (BASIC)

Year 1	Minimum credits		Credits
Fall	8	BIMD 501 Scientific Discovery I BIMD 516 Responsible Conduct in Research	6 2
Spring	8	BIMD 502 Scientific Discovery II BIMD 510 Basic Biomedical Statistics	6 2
Summer	3	BIMD 590	3
Throughout Year		3 Laboratory Rotations Journal Club	
Total credits			19

Year 2	Minimum credits		Credits
Fall	6	BIMD 518 Grant Writing BIMD Elective(s) BIMD590: Research	2 0-4 0-4
Spring	6	BIMD Elective(s) BIMD590: Research	0-6 0-6
Summer	3-6	BIMD590: Research	3-6
Throughout Year		Comprehensive Examination Research Seminars (Faculty and Student) Journal Club	
Total Credits			15-18

Years 3-4	Minimum credits		Credits
Fall	6	BIMD590: Research	6
Spring	6	BIMD590: Research	6
Summer	3-6	BIMD590: Research	3-6
Throughout year		Research Seminars (Faculty and Student) Journal Club Teaching requirement (See Note Below)	
Total credits			15-18

Year 5	Minimum credits		Credits
Fall	6	BIMD 590 Research	6
Spring	6	BIMD 590 Research	6
Summer	6	BIMD 999 Dissertation	6
Throughout year		Research Seminars (Faculty and Student) Journal Club	
Total credits			18
Total credits needed for degree			≥90

Note: Teaching requirement can be completed once comprehensive exam is complete

PHD CURRICULUM (MICROBIOLOGY AND IMMUNOLOGY SUBPLAN)

A model course schedule for a student in the Microbiology and Immunology Specialization is shown below:

Year 1	Minimum credits		Credits
Fall	8	BIMD 501 Scientific Discovery I	6
		BIMD 516 Responsible Conduct in Research	2
Spring	8	BIMD 502 Scientific Discovery II	6
		BIMD 510 Basic Biomedical Statistics	2
Summer	3	BIMD 590	3
Throughout Year		3 Laboratory Rotations	
		Journal Club	
Total credits			19

Year 2	Minimum credits		Credits
Fall	6	BIMD 518 Grant Writing	2
		BIMD 530 Components of Immune System	2
		BIMD 531 Components of Microbial Pathogenesis	2
		BIMD590: Research	0-4
Spring	6	≥5 credits from microbiology and Immunology subplan	
		BIMD 532 Microbial Gene Regulation	1
		BIMD 533 Microbial Membranes and Transport	1
		BIMD 534 Microbial Structure/Function	1
		BIMD 535 Bacterial Host Pathogen Interactions	1
		BIMD 536 Viral Host Pathogen Interactions	1
		BIMD 537 Host Pathogen Inter Eukaryotic Microbes	1
		BIMD 538 immunological Disorders	1
Summer	3-6	BIMD590: Research	0-1
		BIMD590: Research	3-6
Throughout Year		Comprehensive Examination	
		Research Seminars (Faculty and Student)	
		Journal Club	
Total Credits			15-18

Years 3-4	Minimum credits		Credits
Fall	6	BIMD590: Research	6
Spring	6	BIMD590: Research	6
Summer	3-6	BIMD590: Research	3-6
Throughout year		Research Seminars (Faculty and Student)	
		Journal Club	
		Teaching requirement (See Note Below)	
Total credits			15-18

Year 5	Minimum credits		Credits
Fall	6	BIMD 590 Research	6
Spring	6	BIMD 590 Research	6
Summer	6	BIMD 999 Dissertation	6
Throughout year		Research Seminars (Faculty and Student)	
		Journal Club	
Total credits			18
Total credits needed for degree			≥90

Note: Teaching requirement can be completed once comprehensive exam is complete

PhD CURRICULUM (NEUROSCIENCE SUBPLAN)

For students with an interest in the **Neuroscience Specialization**, the following course schedule is proposed to provide a comprehensive overview of the 5 sub-disciplines.

Year 1	Minimum credits		Credits
Fall	8	BIMD 501 Scientific Discovery I	6
		BIMD 516 Responsible Conduct in Research	2
Spring	8	BIMD 502 Scientific Discovery II	6
		BIMD 510 Basic Biomedical Statistics	2
Summer	3	BIMD 590	3
Throughout Year		3 Laboratory Rotations	
		Journal Club	
Total credits			19

Year 2	Minimum credits		Credits
Fall	6	BIMD 518 Grant Writing	2
		BIMD 520 Principles of Neuroanatomy	2
		BIMD 521 Neurophysiology	2
Spring	6	BIMD 522 Principles of Neuropharmacology	2
		BIMD 523 Neurochemical Basis of the Nervous System	2
		BIMD 524 Neurodegenerative Diseases and Pathophysiology	2
Summer	3-6	BIMD590: Research	3-6
Throughout Year		Comprehensive Examination	
		Research Seminars (Faculty and Student)	
		Journal Club	
Total Credits			15-18

Years 3-4	Minimum credits		Credits
Fall	6	BIMD590: Research	6
Spring	6	BIMD590: Research	6
Summer	3-6	BIMD590: Research	3-6
Throughout year		Research Seminars (Faculty and Student)	
		Journal Club	
		Teaching requirement (See Note Below)	
Total credits			15-18

Year 5	Minimum credits		Credits
Fall	6	BIMD 590 Research	6
Spring	6	BIMD 590 Research	6
Summer	6	BIMD 999 Dissertation	6
Throughout year		Research Seminars (Faculty and Student)	
		Journal Club	
Total credits			18
Total credits needed for degree			≥90

Note: Teaching requirement can be completed once comprehensive exam is complete

Student Teaching Guidelines

PhD candidates in the graduate program of biomedical sciences are required to complete a minimum of 2 credit hours of student teaching. An average of 10 hours a week time commitment should be expected of the student, this includes time in class and time spent preparing for class/grading. Students funded by the department and thus designated as GTAs by the graduate school should not be expected to TA more than one lab/lecture section per semester.

Note: Some teaching opportunities require more than 2 credit hour minimum commitment.

Teaching options available:

Microbiology Lab

2 Credit Hour Minimum Commitment

Anatomy Lab

4 Credit Hour Minimum Commitment

2 Credit Hours Shadowing

2 Credit Hours as Lead Teaching Assistant

Advanced Biochemistry Lab

2 Credit Hour Minimum Commitment

Under Specific request:

Undergraduate Lecture

BIMD 501/502 Lecture

Medical School Lecture

Other teaching arrangements can be made with instructor permission and must be approved by advisor and graduate student director.

Note: Students are not expected to meet their teaching requirement during their first and second years in the program and should complete their comprehensive examination requirements before beginning student teaching.

Expectations for each teaching opportunity position should be written by the instructor prior to the beginning of the semester and reviewed by their faculty advisor to ensure they are kept as consistent as possible. These expectations should be available to students as they are researching the different teaching opportunities. Students who are teaching should be aware that they will be expected to continue making progress toward completion of their dissertation research. Students choosing to teach beyond the minimum teaching requirements must get approval from their Faculty Advisory Committee and the graduate program director.

Evaluations will be completed by the faculty overseer and students. The evaluations will be provided to the student at the end of the semester. The student is responsible for providing a copy to the graduate director, and a copy to be placed in the students file.

ELECTIVE COURSES (BIOMEDICAL SCIENCES GRADUATE PROGRAM)

BIMD 514 Foundations of Bioinformatics (Hur) 3 credits. (Prerequisites: Open to graduate and senior undergraduate students with permission of the instructor) In this course, students will learn fundamental concepts and methods in bioinformatics, a field at the intersection of biology and computing. The course surveys a wide range of topics including bioinformatics web resources, computational sequence analysis, sequence homology searching and motif finding, transcriptome analysis, and network/pathway analysis.

BIMD 517 Principles of Histology (Dunlevy) 3 credits. (Prerequisites: PATH 500 or permission of the instructor) Principles of Histology is a laboratory and discussion based course that builds on prior experience in cell biology and involves a strong self-study component through the use of virtual slides as well as lecture and laboratory orientation videos. By the end of the course the student will have demonstrated a significant knowledge base of tissue microanatomy sufficient for understanding and applying the principles to a wide range of research projects. The student will also have gained sufficient knowledge of histology to be capable of teaching this material to medical, professional, graduate, and undergraduate students.

BIMD 520 Principles of Neuroanatomy (Watt). 2 credits. (Prerequisites: BIMD 502 or Consent of Instructor) In this course students will learn the fundamental principles of neuroscience, particularly gross and cellular anatomy, development and systems physiology of the nervous system. Behavioral, cognitive and clinical manifestations of abnormal neural functions will also be addressed.

BIMD 521 Neurophysiology. 2 credits (Carvelli, Doze, Lei). (Prerequisites: BIMD 502 or Consent of Instructor) This course is designed to introduce students to the electrical properties of neuronal membranes. The course is organized to first provide a brief review of the basic properties of semi-permeable membranes. The electrical and biochemistry principles that apply to neuronal membranes are discussed.

BIMD 522 Principles of Neuropharmacology (Henry/Porter). 2 credits. (Prerequisites: BIMD 502 or Consent of Instructor) This course is designed to introduce students to the latest developments in molecular neuropharmacology. The course directive is to provide an up-to-date foundation for clinical neuroscience by emphasizing a comprehensive molecular and cellular approach to the effects of drugs on the nervous system.

BIMD 523 Neurochemical Basis of the Nervous System (Golovko/Rosenberger). 2 credits. (Prerequisites: BIMD 502 or Consent of Instructor) This course is designed to introduce students to fundamental concepts of brain metabolism and neurochemical signaling. It emphasizes recent advances in understanding brain biochemical processes and molecular mechanisms occurring in health and disease.

BIMD 524 Neurodegenerative Diseases and Pathophysiology (Combs/Ghribi). 2 credits. (Prerequisites: BIMD 502 or Consent of Instructor) This course exposes students to diverse neurodegenerative diseases and nervous system pathophysiology. The emphasis is on mechanistic understanding of the most recent advances in the field.

BIMD 525. Readings in Neuroscience (Graduate Advisor). 1 to 4 credits repeatable to a maximum of 4 credits. (Prerequisites: BIMD 502 or Consent of Instructor) A supervised readings course on topics of mutual interest to the student and a faculty member.

BIMD 527. Advanced Studies in Biological Safety (Ghosh) 3 credits. (Prerequisites: Consent of Instructor) students will learn fundamental concepts and methods in biological safety, a field at the intersection of biology and safety. The course surveys a wide range of topics including microbiology, epidemiology, molecular biology, tools for performing risk assessment, and various federal and state regulations regarding biohazardous research. Students will also have opportunities to learn about available biological safety resources through the American Biological Safety Association and other organizations.

PPT 530 Advanced Neurochemistry (Murphy). 3 credits. (Prerequisites: Consent of Instructor) This course is designed to introduce graduate students to the discipline of neurochemistry, with an emphasis on brain biochemical processes occurring in health and disease.

BIMD 526. Medical Experiences for Graduate Students (Basson). 1 credit. (Prerequisites: Successful completion of comprehensive exam and permission of academic advisor and Instructor of Record; student

should initiate discussion with the Instructor of Record at least one month prior to the start of enrollment) The goal of this course is to introduce the graduate student to a "disease-specific" clinical experience so that the student can acquire a better understanding of the importance of translational medicine, develop a firm appreciation of a patient's and a physician's understanding of disease and its treatment, and to introduce the student to the overall culture of clinical research.

BIMD 530 Components of the Immune System (Sharma). 2 credits. (Prerequisites: BIMD 502 or Consent of Instructor) Have you ever wondered why you don't get sick every time you breathe air which can carry as many as 2000 different kinds of microbes on any given day? Or what keeps your defense system from attacking your own cells but can get rid of most invaders without you even noticing? This is the amazing task of your fascinating immune system! This course will provide an overview of cellular and molecular components of mammalian immune system and their function. The students will learn how these components are derived and how they interact and communicate with each other to coordinate a response to pathological insults in order to protect the human body.

BIMD 531 Components of Microbial Pathogenesis (Brissette). 2 credits. (Prerequisites: BIMD 502 or Consent of Instructor) The objective of the course is to provide students with a background in the mechanisms of microbial pathogenesis. Students will learn basic principles of host-parasite interactions. Paradigms of host-parasite interactions will be illustrated by studying, at the molecular and cellular levels, specific infectious diseases and the agents that cause them.

BIMD 532 Microbial Gene Regulation (Brissette/Nilles). 1 credit. (Prerequisites: BIMD 502 or Consent of Instructor) This course will provide an understanding of genetic regulation in bacteria. Classic pathways will be examined as paradigms of regulatory circuits. These examples will be expanded to learn how bacteria exploit host cells as well as the use of bacterial regulatory circuits in modern molecular biology.

BIMD 533 Microbial Membranes and Transport (Brissette/Nilles). 1 credit. (Prerequisites: BIMD 502 or Consent of Instructor) This course will explore bacterial membranes with particular emphasis on generation of energy and transport of molecules across the membranes.

BIMD 534 Microbial Structure/Function (Nilles). 1 credit, (Prerequisites: BIMD 502 or Consent of Instructor) Microbial cells have unique structures that relate their functions. Students completing this course will have an understanding of how prokaryotic and eukaryotic organisms differ and how different structures can be used to obtain similar functions. They will understand how microbial structures influence interactions between microbes and between microbes and eukaryotic organisms.

BIMD 535 Bacterial Host: Pathogen Interactions (Brissette). 1 credit. (Prerequisites: BIMD 502 or Consent of Instructor) The objective of the course is to provide students with a background in the fundamental aspects that occur at the bacterial: host interface. Students will learn the interplay between bacterial virulence factors, strategies used to evade host defenses, and host responses to infection.

BIMD 536 Molecular Biology and Pathogenesis of Viruses (Bradley). 1 credit. (Prerequisites: BIMD 502 or Consent of Instructor) This course will cover the structure, replication, and pathogenesis of human RNA and DNA viruses, the host immune response to viral infection and the strategies employed by viruses to escape immune detection and elimination.

BIMD 537 Host-Pathogen Interactions involving Eukaryotic Microbes (Parasites/Fungi) (Mishra). 1 credit. (Prerequisites: BIMD 502 or Consent of Instructor) Eukaryotic microbe infections have a devastating impact on global health and economic development as they infect over one third of the world's population and cause acute and chronic pathologies. Furthermore, macroscopic parasites (helminths/ worms) are master regulators of host inflammatory response and hence reduce the immune response to coinfections and negatively affect the success of vaccination programs against many other pathogens. In contrast, it has been proposed that the rise in autoimmune diseases in the developed world could be a direct result of the successful complete elimination of parasitic helminths in these communities. Thus, the purpose of this course is to provide a basic knowledge of the clinically important eukaryotic microbe pathogens and the immune response associated with their infections. A series of lectures will cover course components; a) basic introduction to

protozoa, helminth, and fungi, and b) basic knowledge of the immune response and its involvement in parasitic/ fungal infections. An effort has been made to increase clinical relevance and problem-solving skills through a team-learning exercise involving quiz and paper presentations.

BIMD 538 Immunological Disorders (Bradley). 1 credit. (Prerequisites: BIMD 502 or Consent of Instructor) This course will include discussion of cellular and molecular immunopathologies leading to autoimmune diseases, and primary and secondary immunodeficiencies; and the role of the immune system in tumorigenesis and transplantation, as well as various methods of modification of the immune response.

BIMD 539 Readings in Microbiology and Immunology (Graduate Advisor). 1 to 4 credits repeatable to a maximum of 4 credits. (Prerequisites: BIMD 502 or Consent of Instructor) A supervised readings course of topics of mutual interest to the student and a faculty member.

BIMD 591 Advanced Topics in Biomedical Sciences. 1 to 3 credits repeatable to a maximum of 6 credits. (Prerequisites: BIMD502 or Consent of Instruction) A series of lectures, discussions and/or laboratory experiences developed around a specific topic in the biomedical sciences. Repeatable as topics vary. On demand.

Note: There are many graduate level courses offered outside the Department that may be of benefit to the student. These courses can be considered electives provided the student first gets permission from their primary advisor, officially adds the course to their program of study, and communicates this substitution to the Graduate Director prior to taking the course.

FACULTY RECOMMENDED TEXT BOOKS

Molecular Biology/Epigenetics

1. The Cell: A Molecular Approach, Editor Cooper, 2nd Edition, ISBN: 0-87893-106-6.
2. Molecular Biology of the Cell, 4th Edition, Editors: Alberts, Johnson, Lewis, Raff, Roberts, and Walter, ISBN-10: 0-8153-4072-9.
3. Lewin's GENES XI, 11th Edition, Editors: Krebs, Goldstein, and Kilpatrick, ISBN: 978-1449659851.

Biochemistry and Metabolism

1. Text Book of Biochemistry with Clinical Correlations, Editor: Thomas M. Devlin, 7th Edition, ISBN:978-0-470-28173-4.
2. Biochemistry, Editors: Berg, Tymoczko, and Stryer, 5th Edition, ISBN: 0-7167-3051-0.
3. Integration of Metabolism, Energetics, and Signal Transduction, Editor: Robert K. Ockner, ISBN: 0-306-48471-4.

Neuroscience

1. Basic Neurochemistry, Editors: Siegel, Albers, Brady, and Price, 7th Edition, ISBN: 978-0-12-088397-4.
2. Principles of Neural Science, Editors: Kandel, Schwartz, Jessell, Siegelbaum, and Hudspeth, 5th Edition, ISBN: 978-0071390118.
3. Neuroglia, Editors Kettenmann and Ransom, 3rd Edition, ISBN: 9787-0-19-979459-1.

Immunology and infectious disease

1. Molecular Genetics of Bacteria, 4th Edition, Editors: Snyder, Peters, Henkin, Champness, ISBN: 978-1555816278
2. Janeway's Immunobiology, 9th Edition, Editors: Murphy and Weaver, ISBN 978-0815345053

Physiology

1. Medical Physiology, Editors: Boron and Boulpaep, 3rd Edition, ISBN: 978-1455743773.

Pharmacology

1. Molecular Neuropharmacology: A Foundation for Clinical Neuroscience, Editors: Nestler, Hyman, and Malenka, 3rd edition, ISBN: 978-0071827690.
2. A Pharmacology Primer: Techniques for more efficient and strategic drug discovery, Editor: Kenakin, 4th Edition, ISBN: 978-0124076631.

Note: This lists describes only “faculty recommended textbooks” and NOT “required textbooks”. Many of the books on this list can be found in the department or borrowed from faculty or fellow student colleagues if you decide not to purchase.

ASSESSMENT OF STUDENT PROGRESS

The Graduate Faculty of the Biomedical Sciences Graduate Program has established a series of formative and summative evaluations to assess the performance and progress of graduate students through the MS and PhD programs. These evaluations will be conducted on a regular basis for the purposes of helping students achieve their goals, move toward completion of the degree in a timely fashion, and ensure the optimal graduate experience and education for each student. The evaluations also will provide necessary information regarding student progress in order to make administrative decisions regarding ongoing financial support for individual students, and to make appropriate assignments to students in areas of responsibility.

PhD PROGRAM

Summative evaluations of students in the PhD program will occur at two points in the graduate student's career. 1) Students will take the Comprehensive Examination before completion of their second full year of graduate school; performance will be assessed as described in the Comprehensive Examination document. 2) Students will prepare a dissertation and present a formal defense prior to awarding of the degree. The dissertation defense will be evaluated as described in the Dissertation Defense form.

Formative evaluations of each graduate student in the PhD program will take place each academic year. The evaluation will consist of a student self-evaluation (Graduate Student Self Evaluation document, Individual Development Plan, and CV), a research seminar presentation by the student with accompanying evaluation (Seminar Evaluation), and a performance/progress evaluation by the student's faculty advisory committee (Annual Graduate Student Evaluation document). The formative evaluation will set the stage for student/advisory committee discussions and goal setting for the next academic year. Formative comments will be communicated to the student during the meeting and plans for student development will be documented. A copy of the completed Annual Graduate Student Evaluation will be provided to the student; an additional copy will be placed in the student's file.

MS PROGRAM

Summative evaluation of students in the MS program will occur when the student has prepared a thesis and presents a thesis seminar and defense. The defense will be evaluated as described in the Thesis Defense form.

Formative evaluations of each graduate student in the MS program will take place each academic year. The evaluation will consist of a student self-evaluation (Graduate Student Self Evaluation document, Individual Development Plan, and CV), a research seminar presentation by the student with accompanying evaluation (Seminar Evaluation), and a performance/progress evaluation by the student's faculty advisory committee (Annual Graduate Student Evaluation document). The formative evaluation will set the stage for student/advisory committee discussions and goal setting for the next academic year. Formative comments will be communicated to the student during the meeting and plans for student development will be documented. A copy of the completed Annual Graduate Student Evaluation will be provided to the student and an additional copy will be placed in the student's file in the Graduate Directors office.

ANNUAL STUDENT REPORTING (MS and PhD PROGRAMS)

Individual student progress and assessment occurs in two ways. First, the student's Faculty Academic Committee reports on the student's progress and second the student provides an annual self-assessment. Both will send reports outlining their findings to the Graduate Director.

a) Annual Student Evaluation

The student's Faculty Academic Committee will submit to the Graduate Director a yearly Graduate Student Evaluation based on an annual meeting of the student with their Faculty Academic Committee. This report will document the committee's perception of progress towards degree as being satisfactory, marginally satisfactory, or unsatisfactory. This report will describe as a narrative how the committee came to that conclusion and describe solutions for marginal and unsatisfactory progress. The Faculty Academic Committee will also communicate to the student and report to the Graduate Director their recommendations to the student for the next academic year.

b) Graduate Student Self-Assessment

The graduate student will submit to the Graduate Director an annual Self-Evaluation that is dependent on and submitted with an updated Individual Development Plan (IDP), and curriculum vitae (CV). The Self-Evaluation will list accomplishments made by the student describing Publications, Poster Presentations, Oral Presentations, Society/Organization activities, Fellowship Applications, and Graduate Teaching Assignments within the last year. The Student will also provide narrative comments on the following:

Describe how your accomplishments this academic year demonstrate achievement of our "program goals" and identifying specific "program objectives" when applicable. Our program goals and objectives can be found on our department web site.

Describe accomplishments made this academic year that specifically address personal career goals as outlined in your Individual Development Plan (IDP).

Describe specific goals that you and/or your faculty advisory committee have established for the next academic year.

c) Individual Development Plan

It is accepted that an Individual Development Plans (IDP) provides a process that identifies both professional development needs and helps to solidify short- and long-term career objectives. Further, an IDP can serve as a communication tool between students, his or her advisors, and the graduate program. Thus, we ask our students to assess their own career goals with the idea they identify: 1) Long-term career options they wish to pursue and identify the necessary tools to meet these goals and 2) Identify short-term needs for improving current performance.

These reports are due to the Graduate Director prior to the start of the next academic year. Copies of the assessment reports will be maintained in the Graduate Director's office. It is expected that these reports will also be used to track student success beyond graduation.

An example of an annual student report can be found in the appendix.

LABORATORY ROTATIONS AND ADVISOR SELECTION

Laboratory Rotations

Every student enrolled in the Biomedical Sciences Graduate Program will be required to complete at least three rotations in research laboratories prior to selecting the laboratory in which to complete their graduate research. Rotations will fulfill the following aims, which address objectives related to Program Objectives outlined under Program Goal 2 (*Students will become professionals who demonstrate intellectual curiosity and the ability to conduct meaningful scholarly inquiry*):

- Students will explore multiple research opportunities
- Students will gain experience with a variety of laboratory techniques
- Students will gain experience developing and testing hypotheses
- Students will develop multidisciplinary and collaborative aspects of their education
- Students will communicate their laboratory experiences to their peers and advisors
- Rotation experiences will allow students and advisors to assess their mutual suitability, as well as the suitability of laboratory and student

Students will submit a list of choices for rotations to the Graduate Director. Rotation periods will be scheduled in 10-week blocks by the Graduate Director in consultation with the departmental faculty. It is expected that students will be actively engaged in laboratory research for approximately 8 weeks during each rotation period. Rotations will be completed within the Department of Biomedical Sciences or laboratories of faculty outside the Department holding adjunct or joint positions in the Department.

While rotating in a laboratory, the student will be expected to be actively involved in research and/or educational activities supported by the laboratory. The type of project (original research, technique development, or integration into an existing project) will be by mutual agreement between the student and PI and will be formalized into an “Agreement of Laboratory Rotation Expectations” (attached). At the completion of the rotation, the student will submit to the Graduate Director a “Summary of Rotation Experience” (attached). The advisor will evaluate the student’s rotation performance using the “Rotation Evaluation” form (attached) and is expected to discuss the evaluation with the student at the end of the rotation. A Rotation Forum will be held at the end of the third rotation block. Each student will orally present one of their “Summary of Rotation Experiences”. All first year graduate students will be required to attend the Forum. Faculty with whom students rotated will be strongly encouraged to attend the Forum. All other graduate students and faculty will be welcome to attend.

Advisor Selection

The Graduate Director for the Department of Biomedical Sciences Graduate Program will serve as the temporary advisor for all incoming students until they have completed rotations and selected their dissertation/thesis advisor. Dissertation/thesis advisor selections will be finalized at the completion of rotations, normally by the end of the first summer of enrollment.

Matching of students to laboratories will be based on:

- Student’s preference
- PI’s preference, including availability of funds and space for the student in the laboratory.

Students who do not identify a laboratory/advisor for their graduate work by the end of the third rotation will discuss their options with the Graduate Director.

COMPREHENSIVE EXAMINATION GUIDELINES

NOTE: The policies described in this document may be subject to change!

All students enrolled in the PhD program in the Biomedical Sciences Graduate Program will be required to complete the Comprehensive Examination before advancement to candidacy. The Comprehensive Examination will serve as a summative assessment of the skills and knowledge that the student has gained. The aims of the Comprehensive Examination are that the student demonstrate:

- Breadth of knowledge in the biomedical sciences to form a solid basis for scholarly inquiry and flexibility in their career path (Program Objective 1.1)
- Depth and integration of knowledge in specific subject areas of their choice to support their research and to allow them to make meaningful contributions that advance the discipline (Program Objective 1.2)
- The ability to develop clearly stated meaningful hypotheses and research questions that lead to scientific investigation in areas relevant to the biomedical sciences (Program Objective 2.1)
- The ability to select and design experimental approaches to rigorously test their hypotheses (Program Objective 2.2)

The Comprehensive Examination will be completed during the summer semester prior to the beginning of the third full year of the student's enrollment. Specific dates for all steps of the Examination will be determined by the Graduate Director of the Department of Biomedical Sciences Graduate Program in consultation with the student and their Faculty Advisory Committee (FAC). Examinations will be scheduled to maximize the potential for students to apply for predoctoral fellowships and it is expected that, whenever possible, students will apply for such. Examples of such applications include the ND EPSCoR Doctoral Dissertation Assistantship, or the NIH R21 award.

The Comprehensive Examination will be based on the preparation and defense of a research proposal. The participation of all FAC members will be required.

Step I: The student will write a summary of the proposed research including a hypothesis in the form of a Specific Aims page (1-page maximum). This will be submitted to the FAC for approval by June 1.

Step II: Following approval of the Summary page, the student will write a grant proposal describing the proposed dissertation research. The proposal will follow the guidelines for an NIH R21 or equivalent proposal. The proposal should be entirely the work of the student. Discussion of the proposed research with colleagues and the student's advisor is acceptable, but it is expected that the student will demonstrate independence and originality in the proposal. The proposal will be submitted to the FAC by July 15. The FAC will provide feedback to the student within two weeks. The student will revise the proposal, addressing concerns raised by the FAC, and submit the final proposal to the FAC by August 15.

Step III: For the oral defense of the proposal, the student will present a seminar of the research proposal, open to anyone. Following the seminar, the FAC will assess the student's ability to meet the objectives described above. The FAC will decide whether the student meets the expectations required to warrant successful completion of the Comprehensive Examination.

If a student misses any the deadline associated with Steps I or II, without prior written permission from the student's advisor AND graduate program director, will constitute a failure of the exam. In this situation, a new set of deadlines will be reassigned. Failure to meet any of the reassigned deadlines, without prior written permission from the student's advisor AND graduate director will result in failure and dismissal from the PhD program. Students must be successfully complete their comprehensive examination by the end of the Fall semester of their 3rd year of study to remain in the program.

In the event that a student's performance does not meet expectations, the FAC will determine a course of remediation and the student will be given a second opportunity to successfully complete the examination. The student will be given at least one month to prepare for a re-examination. If a student fails re-examination, they will be dismissed from the PhD program.

LEAVE OF ABSENCE GUIDELINES

Guideline Statement

Students in the Biomedical Sciences Graduate Program (BSGP) may be granted a “Leave of Absence” on a case-by-case basis depending on the needs of the graduate program and/or the student.

Definition: Leave of Absence

A “Leave of Absence” is a period of time during which a student chooses to interrupt their studies by temporarily leaving the graduate program with the intention of returning at a later date.

Procedure for requesting a Leave of Absence

Students who wish to take a Leave of Absence from the BSGP must first discuss the reasons for wanting to take leave with their Advisor and Faculty Advisory Committee, prior to informing BSGP Director. The BSGP Director, in consultation with the Department Chair and all parties involved, will initiate the Leave of Absence by contacting the School of Graduate Studies. The BSGP Director and the Department Chair will be responsible for completing and submitting Leave of Absence request forms to the School of Graduate Studies and notifying the student of the final agreed upon parameters and/or stipulations for the Leave of Absence. Degree and certificate seeking students who are found to be Absent without Leave (explained below) will be dismissed from the program and will be required to reapply to regain admission into the School of Graduate Studies.

Leave of Absence Parameters

A Leave of Absence may be granted either as an emergency, on a voluntary basis, or for parental leave.

The decision to approve a request for a Leave of Absence is made at the discretion of the BSGP Director and the Department Chair and may be based on the applicant's academic status, the length of the proposed Leave of Absence, the perceived potential for successful completion of the program, and the ability of the department to support the student both academically and financially, as well as any other factors or considerations regarded as relevant by the BSGP Director and the Department Chair.

The length of a Leave of Absence will be determined by the School of Graduate Studies in consultation with the student and in consideration of the program requirements and availability of resources. A Leave of Absence may be granted for a maximum of two consecutive semesters. A Leave of Absence requested for a period longer than two consecutive semesters are approved only in exceptional circumstances (e.g., mandatory military service or extenuating medical reasons).

An extension of a Leave of Absence is approved only in exceptional circumstances. Extension requests must be made before the expiration of the original Leave of Absence term.

Students on a Leave of Absence are not registered at UND and therefore, do not have rights or privileges of registered students. They cannot fulfill any official department or University requirements during the leave period.

Students on a Leave of Absence will not have key card access to any of the UND facilities and will be required to surrender all UND keys to the Department office while on leave.

Students on a Leave of Absence will not receive a graduate stipend or tuition reimbursement.

Students on a Leave of Absence are required to maintain up-to-date contact information with the Graduate Program Director.

A Leave of Absence does not delay candidacy, coursework, or program expiration dates, unless otherwise specifically stated in the final agreed upon parameters and/or stipulations for the Leave of Absence.

Students on a Leave of Absence with an incomplete course grade are required to make their own arrangements with the course instructor to extend the time-limit to complete the course work prior to beginning their Leave of Absence.

If student is granted (or placed on) a Leave of Absence after the course drop deadline, and does not make prior arrangements to resolve a grade of incomplete, the student will be assigned a grade of "W" (Withdraw) that will appear on the student's transcript.

If the student is an international student, the student must inform their International Student Advisor prior to initiating the request for a Leave of Absence. **IMPORTANT: International students must consult with the International Programs office to ensure that a Leave of Absence during a regular semester will not affect their Visa status and, as such, their ability to remain in the US.**

All Leave of Absence requests must be reviewed and approved by the BSGP director.

The granting of a Leave of Absence is at the discretion of the BSGP, which may condition its approval of a petition for Leave of Absence on the student's meeting such requirements deemed appropriate in the individual's case during the Leave of Absence and before the student is eligible to return to the program.

Mandatory Leave of Absence

A "Mandatory Leave of Absence" can be imposed in circumstances in which a student:

Presents a substantial risk of harm to self or others; or

Significantly disrupts the educational or other activities of the Department of Biomedical Sciences, School of Medicine and Health Sciences or the University community;

Students whose circumstances warrant a consideration of a Mandatory Leave of Absence are notified, in writing, of University concerns and are provided an opportunity to respond to these concerns in writing or in person or via telephone before a review committee. Students placed on Mandatory Leave of Absence can appeal an unfavorable decision using the UND SMHS grievance policy (<http://med.und.edu/policies/students.cfm>). The University can condition a student's return to registered student status on such requirements as the University deems appropriate in the individual case.

Absent Without Leave

A student's academic degree program in the Department of Biomedical Sciences may be discontinued if the student is found to be Absent Without Leave. For purposes of these guidelines, a student may be found Absent without Leave if any of the following occur (this list is not exhaustive):

Fails to be enrolled by the deadline; or

Fails to be approved for a Leave of Absence by the start of the term; or

Voluntarily terminates graduate studies; or

Is dismissed from graduate studies for academic reasons; or

Is expelled from the University.

Procedure for Reinstatement (Readmission)

Students who are found to be Absent Without Leave, depending on the reason for the absence, will be required to reapply according to the normal admissions process to regain admission into the School of Graduate Studies. Students are required to disclose their Absent Without Leave status in their readmission

application. Students dismissed from the program due to being Absent without Leave may be denied readmission based on review of the student's prior progress in the program and their readmission application.

The decision to approve or deny an application for readmission is made by jointly by the BSGP admissions committee and BSGP graduate curriculum committee requiring a simple majority vote of the membership of both committees. The Department of Biomedical Sciences is not obligated to approve an application for readmission. Readmission decisions are made at the discretion of the Department of Biomedical Sciences and may be based on the applicant's academic status when last enrolled, activities while away from campus, the length of the absence, the perceived potential for successful completion of the program, and the ability of the department to support the student both academically and financially, as well as any other factors or considerations regarded as relevant by the Department of Biomedical Sciences. In addition, the Department of Biomedical Sciences retains the right to condition reinstatement on such academic or other conditions as it deems appropriate. A student may appeal an unfavorable decision using the UND SMHS grievance policy (<http://med.und.edu/policies/students.cfm>).

Students who have been expelled are not permitted to apply for readmission.

FORMS AND EVALUATION DUE DATES

Below is a list of activities, School of Graduate Studies forms, and approximate due dates in which they need to be completed. Up-to-date School of Graduate Studies forms can be found and downloaded from their University web site (<http://graduateschool.und.edu/discover-the-grad-school/forms>). Department forms and examples can be found on the Department's blackboard site or directly from the Graduate Director.

Note: It is the responsibility of the Graduate Student to remain informed of all deadlines associated with paperwork needed by the School of Graduate Studies. These deadlines are publishing on the School of Graduate Studies calendar (<http://graduateschool.und.edu/events-all.cfm>) and on the University Registrars web page (<http://und.edu/academics/registrar/calendar-academic.cfm>).

MASTERS STUDENT

Summer Year 1

1. Select an Advisor and Faculty Advisory Committee (3 Biomedical Sciences Faculty + 1 School of Graduate Studies representative)
2. Submit "Program of Study" form to School of Graduate Studies
3. Create and Submit Student Self-Evaluation, Individual Development Plan, and CV to the Graduate Director prior to the start of Fall Semester

Yearly (typically late Spring or Summer Semester)

1. Meet with Faculty Advisory Committee. Advisor will submit evaluation form to the Graduate Director prior to the start of Fall Semester.
2. Submit revised self-evaluation, Individual Development Plan and CV to the graduate Director prior to the start of Fall Semester.

At least six months prior to graduation (published deadlines exist for these items)

1. Submit "Topic Proposal" to School of Graduate Studies
2. Submit "Apply to Graduate" form to School of Graduate Studies

Graduating Semester (published deadlines exist for these items)

1. Submit "Preliminary Approval" form to the School of Graduate Studies
2. Submit "Notice of Thesis Defense" form to the School of Graduate Studies
3. Have School of Graduate Studies perform a format check of your written Thesis
4. Hold your oral defense. Bring to defense for committee signatures: (1) Approval page of dissertation and (2) Final Report on Candidate
5. Submit Electronic PDF of Thesis to UMI/ProQuest for Publishing

6. "Final Report on Candidate" form will be submitted to the School of Graduate Studies by your Advisor
7. Exit interview with Graduate Director

DOCTORAL STUDENT

Summer Year 1

1. Select an Advisor and Faculty Advisory Committee (4 Biomedical Sciences Faculty + 1 School of Graduate Studies representative)
2. Submit "Program of Study" form to School of Graduate Studies
3. Create and Submit Student Self-Evaluation, Individual Development Plan, and CV to the Graduate Director prior to the start of Fall Semester

Summer Year 2

1. Comprehensive Examination
2. Submit "Advance to Candidacy" form to School of Graduate Studies
3. Submit revised self-evaluation, Individual Development Plan and CV to the graduate Director prior to the start of Fall Semester.

Years 3-7 (typically late Spring or Summer Semester)

1. Meet with Faculty Advisory Committee. Advisor will submit evaluation form to the Graduate Director Prior to the start of Fall Semester.
2. Submit revised self-evaluation, Individual Development Plan and CV to the graduate Director prior to the start of Fall Semester.

At least six months prior to graduation (published deadlines exist for these items)

1. Submit "Topic Proposal" to School of Graduate Studies
2. Submit "Apply to Graduate" form to School of Graduate Studies

Graduating Semester (published deadlines exist for these items)

1. Submit "Preliminary Approval" form to the School of Graduate Studies
2. Submit "Notice of Dissertation Defense" form to the School of Graduate Studies
3. Have School of Graduate Studies perform a Format check of your written Thesis
4. Hold your oral defense. Forms to bring to your defense for committee signatures: (1) Approval page of dissertation and (2) Final Report on Candidate
5. Submit Electronic PDF of Thesis to UMI/ProQuest for Publishing
6. Complete survey of Earned Doctorates
7. "Final Report on Candidate" form will be submitted to the School of Graduate Studies by your Advisor
8. Exit interview with Graduate Director.