

# GRADUATE SCHOOL OF BIOMEDICAL SCIENCES

## Molecular Cell Biology and Neuroscience Program STUDENT HANDBOOK

2023-2024

#### **FORWARD**

Welcome to the Rowan-Virtua Graduate School of Biomedical Sciences (GSBS). We are located on the Stratford campus of Rowan University. We have all the benefits of a large University but with a small campus feel. The GSBS has assembled this Molecular Cell Biology and Neuroscience (MCBN) Program Student Handbook to assist you in understanding the operations, procedures, and rules of this program. The GSBS General Information Student Handbook contains useful information on the facilities available on the Stratford campus of Rowan University; specific student services available to you; and a summary of University and GSBS policies pertinent to graduate students.

The mission of the Rowan-Virtua Graduate School of Biomedical Sciences is to develop scientists who will contribute new knowledge in the biomedical disciplines through creative research and scholarship. This is accomplished through a curriculum of course work and research training that prepares our students to critically evaluate existing knowledge and to advance the frontiers of new knowledge in the biomedical sciences.

We seek to attract talented students to all our programs, particularly the Ph.D. and D.O./Ph.D. programs. You will work in modern, well-equipped laboratories with highly committed, enthusiastic faculty exploring current research topics in the biomedical sciences. Our multidisciplinary, interdepartmental program provides a foundational curriculum in Molecular Cell Biology and Neuroscience offered through the combined efforts of the faculty in the <a href="Department of Cell Biology and Neuroscience">Department of Molecular Biology</a>. Doctoral students can expect to receive a stipend, tuition remission, paid health insurance, and paid student health fees.

We sincerely hope that your time here will be filled with a comprehensive educational experience, great science, and an extended network of academic contacts that will lead to a successful career of discovery and innovation in the biomedical sciences. Our Molecular Cell Biology and Neuroscience program graduates have gone on to research careers in academia, the pharmaceutical industry, government agencies, scientific writing and administration. We wish you the best of luck in your journey.

Molecular Cell Biology and Neuroscience Program: This document contains a summary description of the course work, thesis research components, guidelines for the written portions of the research thesis and information on the defense of the dissertation that must be completed for the Ph.D., D.O./Ph.D. and M.S. degrees.

University-wide emergency information: http://www.rowan.edu/emergency or 856-256-4922

The GSBS reserves the right to change or modify the procedures and policies contained within this document. Please check the <u>GSBS website</u> on a regular basis for the most current information on programs, services, news and events.

This handbook is informational only and does not constitute a contract between Rowan University and any student. It may be changed by Rowan University without prior notice to students. Any rules, regulations, policies, procedures or other representations made herein may be interpreted and applied by Rowan University to promote fairness and academic excellence, based on the circumstances of each individual situation.

This handbook represents a program of the current curricula, educational plans, offerings and requirements of the Rowan-Virtua Graduate School of Biomedical Sciences. The School reserves the right to change any provisions, offerings, tuition, fees, or requirements at any time within the student's period of study at Rowan University. In addition, Rowan University may at any time eliminate, modify or change the location of any School, Institute, Center, Program, Department, course or academic activity.

#### TABLE OF CONTENTS

ADMINISTRATION	3
Graduate School Administration and Staff	3
GSBS Departments	4
Registrar's Office	4
Student Support	4
Program Director	4
Center for Student Success	4
Disability Services	4
MCBN Ombudsperson	5
Other Relevant Departments	5
PROGRAMS OF STUDY	5
Molecular Cell Biology and Neuroscience Program	5
The Doctoral Degree	5
Requirements for the Ph.D. Degree	5
Curriculum for the Ph.D. Degree	6
The D.O./Ph.D. Dual Degree	7
Curriculum for the D.O./Ph.D. Degree	8
The Master of Science Degree	8
Requirements for the M.S. Degree	8
Curriculum for the M.S. Degree	9
QUALIFYING REQUIREMENTS	10
The Qualifying Exam and Admission to Ph.D. Candidacy	10
Steps to Official Ph.D. Candidacy	10
Perform at least three Lab Rotations in Different Laboratories	10
Select a Thesis Mentor of Mutual Agreement	10
Guidelines for students performing research for the	11
Ph.D. and M.S. degree at an off-campus location	
Earn an Overall Grade Point Average of 3.00 or better	11
Nominate & Have Approved Thesis Advisory Committee (TAC)	11
Advisory Proposal Meeting	12
Prepare the Thesis Proposal	12
Pass the Qualifying Exam/Thesis Proposal	13
Guidelines for Progress Reports (PhD students only)	14
Annual Thesis Committee Meeting (PhD students only)	15
Thesis Defense Checklist	15
Guidelines for Dissertation Preparation	15
Defense of the Dissertation	17
Graduation, Diplomas and Commencement	18
Stay Connected	18
ADDENDUM	19
MCBN Program Achievement Milestones and Deadlines	19

#### **ADMINISTRATION**

#### **GSBS ADMINISTRATION AND STAFF:**

Senior Associate Dean, GSBS

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Stratford, NJ, 08084

#### **GSBS DEPARTMENTS**

The administration for the departments of Cell Biology & Neuroscience and Molecular Biology are located at 42 East Laurel Road, Rowan Medicine Building, Suite 2200 on the Stratford campus.

Cell Biology & Neuroscience Department		
Chair	Barry Waterhouse, Ph.D.	566-6407
Business Administrator	Lynn Robbins 566-6417	
Program Support Specialist	Lisa Stressman	566-6078
Budget Analyst	Alisa Corbitt	566-6067
Administrative Assistant	Marquishia Stringfield	566-6231
Molecular Biology Department		
Chair	Salvatore Caradonna, Ph.D.	566-6056
Business Administrator	Karen Baines	566-7003
Program Assistant	Renee Fidler	566-6049
Administrative Assistant	Theresa Luscko	566-6077

#### **REGISTRAR'S OFFICE**

The Rowan University Registrar's Office is responsible for the registration of all GSBS students as well as preparation, maintenance and issuance of all official grades and records pertaining to GSBS students. The Registrar's office is located on the bottom floor of Savitz Hall in Glassboro. Contact them by email at <a href="mailto:registrar@rowan.edu">registrar@rowan.edu</a> or by telephone (856) 256-4350.

#### STUDENT SUPPORT

#### PROGRAM DIRECTOR

Molecular Cell Biology and Neuroscience Daniel Chandler, Ph.D. <u>chandlerd@rowan.edu</u> (MCBN)

#### CENTER FOR STUDENT SUCCESS

Mary Sylvester-Pegues, Program Coordinator for GSBS Students sylvesterpegues@rowan.edu

The Center for Student Success (CSS) was established to maximize the educational experiences of GSBS and SOM students. CSS staff provide a variety of supportive academic services, including: 1) individual consultation on study strategies and learning styles, 2) group workshops on topics related to academic success, 3) individual meetings to review curriculum requirements and create an individualized academic plan and 4) workshops and individual consultations on test-taking strategies.

#### DISABILITY SERVICES

Jacqueline Giacobbe, Assistant Dean

Academic Center, Suite 210 giacobja@rowan.edu

Academic Center, Suite 210

Rowan-Virtua School of Osteopathic Medicine or GSBS does not discriminate in admission or access to its programs and activities on the basis of race/color, ethnicity, national origin, religion/creed, disability, age, marital status, sexual orientation or veteran's status. The University will provide, if requested, reasonable accommodations to otherwise-qualified enrolled students and candidates with disabilities. Further information about accommodations can be obtained from SOM/GSBS Disability Services at 856-566-6980.

#### STUDY SKILLS FOR GRADUATE SCHOOL AND BEYOND

The "Study Skills for Graduate School and Beyond" book is available <u>online</u> to every student. It provides many helpful strategies [1) Time Management and Organization, 2) Learning the Material, 3) Test-Taking, and 4) Mental and Physical Health] to assist students in designing a study plan.

#### MCBN OMBUDSPERSON

westniedringhaus@rowan.edu

The Ombudsperson is an impartial, independent and confidential resource for graduate students within the MCBN program. The main goal of the Ombudsperson is to ensure that the graduate student voice is heard by an impartial party. Please go here for complete information.

OTHER RELEVANT DEPARTMENTS can be found in the GSBS General Information Student Handbook.

#### **PROGRAMS OF STUDY**

The GSBS offers three degrees within the Molecular Cell Biology and Neuroscience Program: 1) the Doctor of Philosophy (Ph.D.) degree, 2) the D.O./Ph.D. dual degree in association with the School of Osteopathic Medicine, and 3) the Master of Science (M.S.). The M.S. program is designed for students considering a doctoral program, a career in academia or biomedical research, and/or can allow a student to seamlessly transition into the MCBN Ph.D. program, if the student is interested and qualified. Alternatively, on occasion, a research-based M.S. degree may be granted to a Ph.D. student who has fulfilled the requirements for the M.S. but is not qualified or cannot continue for the Ph.D. Non-research degrees are not offered within the Molecular Cell Biology and Neuroscience Program. The course of study is continuous, includes summers and requires a substantial research contribution culminating in a dissertation.

In the Fall and Spring terms, full-time matriculated students in the MCBN program are expected to carry a minimum course load of 9 credits per semester while part-time MCBN students must carry a minimum of 5 credits per semester. In the Summer term, full-time matriculated students in the MCBN program are expected to carry a minimum course load of 4 credits per semester while part-time MCBN students must carry a minimum of 2 credits per semester. Ph.D. students must be engaged full time in order to maintain their stipend. There is no financial support offered to M.S. students.

GSBS students in all programs of study are required to maintain Good Academic Standing. Please see your program-specific policy for details: Academic Standing-Molecular Cell Biology and Neuroscience program

#### THE DOCTORAL DEGREE IN MOLECULAR CELL BIOLOGY AND NEUROSCIENCE

The Ph.D. degree is awarded on the basis of achievement in a wide range of course work; experience in classroom teaching and laboratory instruction; an advisory meeting to determine the preparedness of a student entering their second year of study; a comprehensive qualifying examination evaluating the breadth of background knowledge and the ability for independent thinking; intensive research experience during which the candidate demonstrates ability to initiate, perform, and analyze original experimental work; a written dissertation; and a public defense of the dissertation through a final oral examination.

#### REQUIREMENTS FOR THE Ph.D. DEGREE

Students will be introduced to basic biomedical science through graduate level course work shown in the Curriculum table below, and must complete at least 4 semesters of Thesis Research after completing their qualifying exam. The requirements for the Ph.D. Degree must be completed within seven years regardless of full-time or part-time status. The student must be in full time status for at least one academic year during the dissertation research.

Minimum requirements for the Ph.D. include, but are not limited to, the following:

- 1. Complete the required Curriculum in the Table below with an overall coursework GPA of 3.0 or higher.
- 2. Complete three laboratory rotations within different labs. A fourth rotation in a different lab may be completed if necessary.
- 3. Come to a mutual agreement with a faculty mentor for Theis Research by June 1 of year 1.

- 4. Assemble a Thesis Advisory Committee by July 1 of year 1.
- 5. Holding the Thesis Advisory Proposal Meeting by September 15 of year 2.
- 6. Minimum 3.00 cumulative overall GPA after completion of all year 1 and year 2 curriculum (including rotations).
- 7. Sit for and pass the Qualifying Examination/Thesis Proposal by July 1 of year 2 as specified by the Program. If the student does not pass the Qualifying Examination on their first attempt by July 1, the Thesis Advisory Committee may grant permission for re-examination by August 15 of year 2.
- 8. Minimum of four semesters of Thesis Research.
- 9. A dissertation based upon independent research, prepared by the candidate and acceptable to the candidate's Thesis Advisory Committee.
- 10. A successful public defense of the dissertation before the candidate's Thesis Advisory Committee and the scientific community.

#### CURRICULUM FOR THE Ph.D. DEGREE

Foundation Courses (Year 1) (4 credits)	Skill Courses (Year 1) (2 credits)	Focus Courses (Year 2) (2-3 credits)
Fall: MCBN Foundations I	Fall: Quantitative Methods	Fall (Select 2):
		Biomolecular Interactions,
		Cell Culture & Stem Cells,
		Neuroanatomy, Neurophysiology
Spring: MCBN Foundations II	Spring: Scientific Writing	Spring (Select 2):
		Graduate Genetics, Immunology,
		Neuropharmacology & Behavior,
		Research Topics in Neurobiology

All first-year students will also take Responsible Conduct in Research and 2 Laboratory Rotation courses in the fall semester and 2 Laboratory Rotation courses in the spring semester. If a student has identified a mentor by the end of their third rotation, their second rotation for the Spring term will be completed in that laboratory.

All second-year students will take 2 Focus courses and Advanced Graduate Research in both the fall and spring

All second-year students will take 2 Focus courses and Advanced Graduate Research in both the fall and spring semesters.

Foundation Courses (4 credits each). Students must pass each of these courses:

MCBN Foundations I MCBN Foundations II

**Skill** Courses (2 credits each). Students must pass each of these courses:

Quantitative Methods Scientific Writing

**Focus** Courses (2-3 credits). Students must pass 4 of the following:

Biomolecular Interactions Neuroanatomy

Cell Culture & Stem Cells Neuropharmacology & Behavior

Graduate Genetics Neurophysiology

Immunology Research Topics in Neurobiology

#### Other Required Courses. Students must pass:

Responsible Conduct of Research training course (0 credits that must be passed every 4 years) Laboratory Rotation A, B, C, D (2 credits each) – Students are required to rotate in 3 different labs.

Each lab rotation is 7-weeks long. A 4<sup>th</sup> lab rotation can be in a different lab or the thesis mentor's lab.

For DO/PhD students, the Lab Rotation A course is for your Summer Medical Research Fellowship.

Summer Research in Molecular Cell Biology and Neuroscience (4 credits; 2 semesters)

Advanced Graduate Research (5 credits; 2 semesters) Thesis Research/Ph.D. (9 credits; minimum of 4 semesters) Summer Thesis Research (4 credits; 1 semester minimum)

Students electing the Ph.D. in Molecular Cell Biology and Neuroscience Program (thesis) will be required to satisfactorily complete a research thesis acceptable to the Thesis Advisory Committee of the student.

The Chart of the Ph.D. Curriculum, the current course listings and course descriptions can be found here <a href="https://gsbs.rowan.edu/student-resources/registrar/registration.html">https://gsbs.rowan.edu/student-resources/registrar/registration.html</a> on the GSBS website.

#### D.O./Ph.D. DUAL DEGREE -- MOLECULAR CELL BIOLOGY AND NEUROSCIENCE PROGRAM

The dual degree program leading to the DO and PhD degrees represents a merging of the separate and distinct academic programs of the Rowan-Virtua School of Osteopathic Medicine (SOM) and the Rowan-Virtua Graduate School of Biomedical Sciences. It is recognized that the core coursework of both programs will need to be mastered to the satisfaction of each academic unit. A student interested in a dual degree must apply and be accepted to each of the schools independently. Students must be enrolled in the DO program at SOM at the time of application and they must obtain a "Pass" grade in medical school courses. Applicants also must have participated in the SOM Summer Medical Research Fellowship (SMRF) program with a GSBS basic science faculty member during the summer of the first year of the DO program. A list of eligible GSBS faculty members can be found on this weblink "Faculty Research Interests".

#### Final entry into the DO/PhD dual degree program is contingent upon the student passing COMLEX, Part I.

The first two years of the DO/PhD program consist primarily of pre-clinical medical school courses. <u>One mandatory</u> laboratory rotation must be performed in the summer following the first year as part of the SOM Summer Medical Research Fellowship (SMRF) program. Students would then apply to the DO/PhD dual degree program in the Fall of Year 2 in the DO program. A letter of recommendation from the basic science GSBS faculty mentor is among the application requirements for the doctoral degree in Molecular Cell Biology and Neuroscience program. Students will complete the first two years of the medical school curriculum and successfully pass COMLEX part I, BEFORE beginning the graduate program. <u>Therefore</u>, a student MUST take the COMLEX, Part I no later than the end of June so that the GSBS is aware that they have passed prior to starting the PhD phase.

In the summer following the second year of medical school, students may perform their second lab rotation of 7 weeks so that when they start in the fall, they will only need to perform one more lab rotation. If the second lab rotation is not completed in the summer, then two rotations will need to be completed during the fall semester. Year 3 of the DO/PhD program begins full time course work and research towards the PhD degree.

During Year 3 (year 1 of the PhD portion of the Program), students will begin graduate course work according to the chart of curriculum for the PhD program above. Students are required to come to a mutual mentor/mentee agreement with a faculty advisory by January 1 and form a Thesis Advisory Committee by July 1 of the same academic year. The Thesis Advisory Proposal Meeting (APM) must then be completed by September 15<sup>th</sup> of the following academic year (year 4 overall, year 2 of the PhD portion of the Program). The student must then sit for the Qualifying Exam/Thesis Proposal by July 1 of the same academic year. Course work for the PhD degree should be completed by the end of Year 4 overall (year 2 of the PhD portion of the Program). Subsequently, students begin full-time research to work towards the completion of their PhD degree. There is no set timeline for DO/PhD students to complete their PhD degree, but the students must write their dissertation and defend their thesis in public within 7 years after beginning their PhD coursework. Students will NOT be permitted to return to the DO program until they have publicly defended their doctoral thesis. The final two years of the program focus on clinical experience. Coordination between the clinical and research years is designed to facilitate a smooth transition between aspects of the Program.

DO/PhD scholarships may be available to accepted applicants to the Program. Scholarships include tuition waivers and a stipend during some years in the Program. They currently are:

• DO Years 1-2: No tuition waiver, stipend or health insurance from the SOM.

- PhD Years 3 to completion of degree: Tuition waiver, stipend, paid health insurance and some student fees from the GSBS.
- DO years (2 remaining): Tuition waiver but no stipend or health insurance from SOM.

#### CURRICULUM FOR THE D.O./Ph.D. DEGREE

The D.O./Ph.D. Curriculum has the same requirements as the Ph.D. Curriculum (see previous section for degree requirements). The Chart of the D.O./Ph.D. Curriculum, the current course listings and course descriptions can be found here https://gsbs.rowan.edu/student-resources/registrar/registration.html on the GSBS website.

## THE MASTER OF SCIENCE DEGREE -- MOLECULAR CELL BIOLOGY AND NEUROSCIENCE PROGRAM

The Master of Science (M.S.) program in Molecular Cell Biology and Neuroscience (thesis-based only) is both a program for students interested in a career in basic science research, especially if they are considering a doctoral degree, and a default program for doctoral students who elect not to pursue a Ph.D. degree or who are dismissed from the Ph.D. program. The academic program is designed to provide a rigorous base of knowledge in basic biomedical sciences with emphasis on fundamental principles of Molecular Cell Biology and Neuroscience and practical problem-solving skills. Students are required to engage in fundamental research in Molecular Cell Biology and Neuroscience and to prepare a research-based dissertation to complete the degree requirements. The course of study is continuous and includes summers. MS students in the MCBN program may apply to transfer to the PhD program after they have successfully completed at least one semester. The transfers are not guaranteed and must be recommended by the MCBN Admissions Committee, authorized by GSBS Executive Council, and are subject to availability of funds.

#### REQUIREMENTS FOR THE M.S. DEGREE

The requirements are designed such that the Master of Science degree can be completed within two years but otherwise it must be completed within no more than five years.

The minimum requirements for the M.S. degree include, but are not limited to, the following:

- 1. Complete the coursework in the Curriculum table below with a minimum GPA of 3.00.
- 2. Complete three laboratory rotations within different labs. A fourth rotation in a different lab may be completed if necessary.
- 3. Come to a mutual agreement with a faculty mentor for Thesis Research by June 1 of year 1.
- 4. Assemble a Thesis Advisory Committee by July 1 of year 1.
- 5. Minimum 3.00 cumulative overall GPA after completion of all year 1 and year 2 curriculum (including rotations).
- 6. A Master's Thesis Proposal, which is a thesis research plan, that is deemed acceptable by the candidate's Thesis Advisory Committee by December 30 of year 2.
- 7. A dissertation based upon independent research prepared by the candidate and acceptable to the Thesis Advisory Committee.
- 8. A successful public defense of the dissertation before the candidate's Thesis Advisory Committee and the scientific community.

### CURRICULUM FOR THE M.S. DEGREE -- MOLECULAR CELL BIOLOGY AND NEUROSCIENCE PROGRAM

Foundation Courses (Year 1) (4 credits)	Skill Courses (Year 1) (2 credits)	Focus Courses (Year 2) (2-3 credits)
Fall: MCBN Foundations I	Fall: Quantitative Methods	Fall (Select 1):
		Biomolecular Interactions,
		Cell Culture & Stem Cells,
		Neuroanatomy, Neurophysiology
Spring: MCBN Foundations II	Spring: Scientific Writing	Spring (Select 1):
		Graduate Genetics, Immunology,
		Neuropharmacology & Behavior,
		Research Topics in Neurobiology

All first-year students will also take Responsible Conduct in Research and 2 Laboratory Rotation courses in the fall semester and 2 Laboratory Rotation courses in the spring semester.

All second-year students will take 1 Focus course and MS Thesis Continuation in both the fall and spring semesters.

Foundation Courses (4 credits each). Students must pass each of these courses:

MCBN Foundations I MCBN Foundations II

**Skill** Courses (2 credits each). Students must pass each of these courses:

Quantitative Methods Scientific Writing

**Focus** Courses (2-3 credits). Students must pass 2 of the following:

Biomolecular Interactions Neuroanatomy

Cell Culture & Stem Cells Neuropharmacology & Behavior

Graduate Genetics Neurophysiology

Immunology Research Topics in Neurobiology

#### Other Required courses for M.S. students. Students must pass:

Responsible Conduct of Research training course (0 credits that must be passed every 4 years)

Laboratory Rotation A, B, C, D (2 credits each) – Students are required to rotate in 3 different labs.

Each lab rotation is 7-weeks long. A 4th lab rotation can be in a different lab or the thesis mentor's lab.

Thesis Research/M.S. (7 credits) (typically summer of year 1)

MS Thesis Continuation (Thesis Proposal; 7 credits in the fall no tuition; matriculation fee only)

MS Thesis Continuation (Thesis Defense; 7 credits in the spring no tuition; matriculation fee only)

MS Thesis Continuation (2 credits in the summer no tuition; matriculation fee only)

Students electing the Master of Science in Molecular Cell Biology and Neuroscience Program (thesis only) will be required to satisfactorily complete a research thesis acceptable to the Thesis Advisory Committee of the student.

GSBS students in all programs of study are required to maintain Good Academic Standing. Please see your program-specific policy for details: Academic Standing-Molecular Cell Biology and Neuroscience program

The Chart of the M.S. Curriculum, the current course listings and course descriptions can be found here <a href="https://gsbs.rowan.edu/student-resources/registrar/registration.html">https://gsbs.rowan.edu/student-resources/registrar/registration.html</a> on the GSBS website.

#### MCBN PROGRAM ACHIEVEMENT MILESTONES AND DEADLINES

All MCBN degree (PhD, DO/PhD, and MS) program achievement milestones and deadlines for the current academic year can be found in the Addendum at the end of this student handbook.

#### **QUALIFYING REQUIREMENTS**

#### THE QUALIFYING EXAMINATION AND ADMISSION TO Ph.D. CANDIDACY

The Qualifying Examination is designed to assess the student's competency to conduct Ph.D.-level research. In order to be eligible to take the Qualifying Examination, the student must have completed a minimum of 38 credits which includes classroom, lab rotation credits, and other research course credits. The student must have a grade point average (GPA) of 3.00 or better, cumulative in the classroom courses, and overall, and have satisfied any additional curriculum requirements as specified by the Molecular Cell Biology and Neuroscience Program. The student is admitted to candidacy for the Ph.D. degree upon passing the Qualifying Examination. All eligible Ph.D. and D.O./Ph.D. students must sit for their qualifying exam by July 1 during their second year. DO/Ph.D. students are especially encouraged to complete their Qualifying Exam as early as possible during the second semester of Year 2 to facilitate timely completion of their thesis research. Students who do not sit for their qualifying exam by July 1 will be dismissed from the PhD program. If a student sits for the qualifying exam but does not pass, their Thesis Advisory Committee may grant then one opportunity for a reexamination by August 15. Failure to pass the second chance will result in dismissal from the program. Individual students may petition Executive Council to extend either deadline if extenuating circumstances impact their ability to complete their qualifying exam, but Executive Council is not obliged to grant the request if they do not deem the request necessary or valid.

#### STEPS TO OFFICIAL Ph.D. CANDIDACY

- 1. Perform at least three Lab Rotations within different labs.
- 2. Select a Thesis Mentor of Mutual Agreement.
- 3. Earn minimum 3.00 cumulative GPA in the classroom courses assessed at the end of each academic year.
- 4. Nominate a Thesis Advisory Committee.
- 5. Prepare the Thesis Advisory Proposal.
- 6. Participate in the Thesis Advisory Proposal Meeting.
- 7. Earn minimum 3.00 cumulative overall GPA after completion of all year 1 and year 2 curriculum.
- 8. Prepare the written Thesis Proposal and submit to the Thesis Advisory Committee for evaluation.
- 9. Pass the Qualifying Exam by successfully defending the Thesis Proposal to the Thesis Advisory Committee after a public presentation of the proposal.

#### PERFORM AT LEAST THREE LAB ROTATIONS IN DIFFERENT LABORATORIES

It is the student's responsibility to find a faculty mentor. Students are strongly encouraged to become aware of the research programs of individual faculty members during their first year in the graduate school. This can be done by going to the GSBS website, attending seminars, perusing the individual faculty members' web sites, and discussions with the faculty. In addition, at the beginning of the fall semester the MCBN program hosts an "Open Lab Day" to explore the Cell Biology & Neuroscience and Molecular Biology labs. Each MCBN student is required to participate in three lab rotations within different labs in their first year. The MCBN student should spend the first two weeks of the semester seeking out and talking to prospective mentors. Before the end of week two, the faculty member who selects a student will complete the "MCBN Lab Rotation Agreement" form. Each lab rotation is 7 weeks in length. With this type of scheduling, a student will accomplish 2 rotations in each semester of their first year. The 7 weeks length of time for each lab rotation affords a student a fourth lab rotation in a different lab or the lab of their mutually agreed upon future mentor.

#### SELECT A THESIS MENTOR OF MUTUAL AGREEMENT

In the normal course of events, students in the MCBN program will most likely select their thesis advisor from among those faculty members who served as a mentor during the laboratory rotations. The student should recognize that it can take 5-7 years to complete a Ph.D. program and 2-3 years to complete a M.S. program. The resources, activity of the laboratory, and the likelihood of continued stipend support (for Ph.D. students) are additional factors to consider when selecting a mentor. Students should also be aware that the GSBS Bylaws permit only fully titled members of the GSBS Graduate Faculty to serve as thesis advisors.

The student must come to a mutual agreement with a faculty mentor to complete their thesis work in their laboratory by June 1<sup>st</sup> of their first year. Failure to do so will result in loss of Good Academic Standing. If the student has still not come to a mutual agreement with a faculty mentor by June 15<sup>th</sup> of the first year they will be dismissed from the program. DO/PhD students must select mentors by January 1<sup>st</sup> of the 1<sup>st</sup> Year. The Ph.D. student, mentor, department chair and Senior Associate Dean of the GSBS must complete the "Policy for Graduate Student Support: Rowan-Virtua Graduate School of Biomedical Sciences (GSBS) and Rowan-Virtua School of Osteopathic Medicine (SOM)" and submit it to the GSBS Office according to the dates above. For M.S. students, an email confirmation of mutual agreement between the student and the mentor is required.

## GUIDELINES FOR STUDENTS PERFORMING RESEARCH FOR THE Ph.D. AND M.S. DEGREE AT AN OFF-CAMPUS LOCATION

Most research for the Ph.D. and M.S. degree is performed on the SOM campus with one of the faculty of the GSBS. In cases where students choose to perform research in a laboratory that is not on our campus the following guidelines must be followed:

- The off-campus advisor must have an appointment as a GSBS Graduate Faculty Member.
- Selection of a mentor who is not a full member of the GSBS Graduate Faculty may affect the doctoral stipend availability beyond Year 1. Please consult the GSBS office for more information.
- The student must have a Mentor-of-Record who is a full member of the GSBS Graduate Faculty.
- At least two members of the Thesis Advisory Committee must be from the full-time graduate faculty.

  The arrangement must be approved by the department of the Mentor-of-Record (Chair and Program Director) and the Executive Council.
- At least two advisory group meetings per year must be scheduled to monitor progress of thesis research.
- The work to be performed must conform to the same standards as those applied to other students in GSBS (high standards of excellence, scholarly in nature, non-proprietary and hypothesis driven).

#### EARN AN OVERALL GRADE POINT AVERAGE OF 3.00 OR HIGHER

All MCBN students must complete at least 20 course credits of relevant graduate level course work per year beyond the baccalaureate with an <u>overall</u> academic average of 3.00 or higher. If the student does not earn a 3.00 or higher overall GPA, the student is not in good academic standing.

#### NOMINATE AND HAVE APPROVED THESIS ADVISORY COMMITTEE (TAC)

The Thesis Advisory Committee will have oversight responsibility for the development of the student and their thesis project. This committee will continually monitor the research competency and progress. The committee should work for the mutual benefit of the student and their faculty mentor. While the committee should uphold suitably high standards for the student and assist the mentor in achieving their research goals, they should also ensure fairness and act in the best interest of the student's education and career.

The Thesis Advisory Committee (TAC) must be established and approved by GSBS Executive Council by July 1 of the first year. The Ph.D. and the D.O./Ph.D. TAC must be composed of the mentor and at least four other qualified members while the M.S. TAC must be composed of the mentor and at least two other qualified members. One of the TAC members may be from outside of the GSBS Faculty, if their expertise is appropriate. The student and mentor nominate the committee members using the *Thesis Advisory Committee Nomination Form* (see GSBS Student Forms). Each nomination should be supported by a brief explanation for the individual's selection to the Committee. The signed form is given to the Department Chair for approval. The Department Chair or Senior Associate Dean may recommend committee members other than those nominated. The signed nomination form is given to the Director for submission to the Executive Council. The final membership of the committee is approved by the Executive Council.

After the TAC members are approved, a Committee Chair must be designated. The committee members decide who serves as Chair with input from the student and mentor. The Chair must be a member of the GSBS Faculty within

the program and may not be the student's mentor. There is no formal procedure to select the Chair, but it is expected that the Chair is agreed upon by the TAC members. At the latest, the TAC Chair must be selected before the start of the Advisory Proposal Meeting.

#### ADVISORY PROPOSAL MEETING

An Advisory Proposal Meeting between the student and their approved TAC is required. The students must:

- 1. Schedule the Advisory Proposal Meeting with the approved TAC members any time after approval of the TAC but no later than September 15th at the start of the 2nd Year. A minimum of four (4) TAC members must be present.
- 2. Prepare the Thesis Advisory Proposal Document according to the guidelines below and submit it to all TAC members no later than one week prior to the scheduled Advisory Proposal Meeting date.
- 3. Submit the Advisory Proposal Meeting date to the GSBS Office by email (gsbs-stratford@rowan.edu).

The Advisory Proposal should include research plans for the next academic year and may be the initial steps of a likely thesis project. It should be brief and focused on short term goals. It must include a title page, abstract, brief background, major question(s) to be addressed, specific experiments or analyses to be performed, interpretations, and contingency plans. The Advisory Proposal should follow the thesis proposal format (see below) and the writing should be of high quality. This will serve as a basis for discussion at the meeting. With the help of their mentor, the student should use the committee's guidance and the intervening year to craft a well-defined and rigorous Thesis Proposal, to acquire the relevant knowledge, and to obtain preliminary data.

The Advisory Proposal Meeting is not pass/fail. However, the committee may make specific requests, such as a rewritten Advisory Proposal, that must be fulfilled within a time period specified by the committee. The Advisory Proposal Meeting is required and will help the student be better prepared for their Thesis Proposal/Qualifying Exam.

At the start, the committee should meet briefly with the mentor while the student is out of the room. Likewise, the committee should also meet briefly with the student while the mentor is out of the room. This provides both the student and the mentor the opportunity to discuss the student's progress and their working relationship in a private forum with the committee. The chair moderates the Advisory Proposal Meeting and is responsible for a written summary of the committee's evaluation of the Advisory Meeting to be submitted to the student and to the GSBS office as part of their file and as a record for completion of the requirement. They are expected to serve as chair through the student's thesis defense, although a new chair may be selected by the committee at a future meeting, if necessary. The student's laboratory performance, their exceptional abilities or deficiencies, or issues pertaining to the science may be raised. The chair and the committee members should agree on how the Advisory Meeting will be conducted, including the degree of involvement by the mentor in answering questions. The student may be asked about relevant technical and scientific issues, as well as basic knowledge. The chair may call on the student's mentor to resolve an issue, if necessary. The chair, or a designate, should take notes to prepare the summary letter for the student. An important goal of the Advisory Proposal Meeting is to provide the student with useful feedback for the Qualifying Examination. The Advisory Proposal Meeting Report should indicate the strengths and weaknesses of the student, his or her project, constructive criticisms, as well as a firm idea of what is expected at the Qualifying Examination. A draft report is circulated among the committee members and revised. A sample Advisory Proposal Meeting Report Letter is available on the web (see GSBS Student Forms). The chair is responsible for submitting the final Advisory Proposal Meeting Report and Advisory Proposal Meeting Cover Letter (see GSBS Student Forms) to the student, mentor and the GSBS office.

#### PREPARE THE QUALIFYING EXAM/THESIS PROPOSAL

The thesis proposal is written in the format of a grant application:

Title page should contain:

Title in capital letters Name of the student Name of the mentor Date of Qualifying Exam

#### Abstract (500 words for PhD and 250 words for MS)

A summary of the entire proposal.

#### Specific Aims (1 page)

Concise descriptions of the hypothesis to be tested and each experimental aim. Two to three aims is usually appropriate.

#### Background and Significance (2-3 pages for PhD and 1-2 pages for MS)

A brief overview of the issues that lead to the present proposal containing sufficient information to understand the experimental aims and relate them to overall scientific objectives. Not a review of all the related science. Section headings suggested.

#### Preliminary Results (2-4 pages, including figures for PhD and 1-2 pages, including figures for MS)

Brief description of findings by the student and/or the laboratory that are directly relevant to the experimental aims of the proposal. Should indicate who is responsible for the data if not the student. Figures should be concisely captioned. Details of methods are not necessary.

#### Experimental Design and Methods (4-8 pages for PhD and 2-4 pages for MS)

The rationale, approach, procedures, expected outcomes and their interpretations, possible difficulties, and alternative approaches for each aim. Should include a tentative sequence or timeline.

#### Human Subjects and/or Non-Human Vertebrates

Rationale for use of protected subjects and the procedures relevant to protecting their welfare.

#### References

The references may be numbered or alphabetized and must include authors, title, journal, volume, page numbers and year.

All pages should have margins of no more than 1 inch, lines of no more than 1.5 spacing, and a font no smaller than 12 pt Times New Roman.

The student should prepare a draft of the proposal and submit it to his/her mentor. The mentor should not write or re-write the proposal. The mentor is expected to guide the selection of the issues to be addressed and experimental approaches. Ideas and preliminary data may come from others.. However, it is expected that the student is the sole author of the proposal.

The written thesis proposal must be submitted to each member of the committee two weeks prior to the date of the Qualifying Exam. Because writing and revising the final draft of the proposal may take many days to weeks, it is strongly recommended that the student prepare a complete draft of the proposal at least one month in advance of the expected exam date. If the committee is not given sufficient time to review the written proposal or if the proposal is obviously substandard, the committee may elect to postpone the scheduled examination.

The student should prepare a PowerPoint presentation outlining the proposal to give at the Qualifying Examination/Thesis Proposal.

#### PASS THE QUALIFYING EXAMINATION/THESIS PROPOSAL

The Qualifying Examination/Thesis Proposal is conducted by the approved Thesis Advisory Committee (TAC). Ph.D. students must be in Good Academic Standing to take their Qualifying Examination/Thesis Proposal at the end of the 2<sup>nd</sup> Year. The online *Qualifying Examination/Thesis Proposal Evaluation* form records the TAC members' individual votes and evaluations of a MCBN student's Qualifying Exam/Thesis Proposal. All members of the TAC must complete this form and vote "Pass" for the student to pass. This form may be completed no more than twice for each student. The student may also complete this form as a self-assessment.

For Ph.D. and DO/Ph.D. students, prior to the Qualifying Examination, the approved Thesis Advisory Committee should review the Advisory Proposal Meeting report from last year and use this as a starting point for the Qualifying Examination. During the Qualifying Examination (or Thesis Proposal for M.S. students), the TAC assesses the specific proposal by the student and the ability of the student to carry out the proposal toward earning a Ph.D. or M.S. degree, respectively. Coursework, rotations, general knowledge, as well as understanding of the proposed project, may be considered in making the evaluation. A summary of the student's academic performance, including grades, will be prepared by the GSBS office and distributed to the committee prior to the exam date, if requested.

Each committee conducts a fair and thorough examination of the student as they see fit, but in a collegial manner with the best interest of the student in mind. At least two hours should be allotted for the examination. At the start, the committee should meet briefly with the student while the mentor is out of the room. Additionally, the committee should meet briefly with the mentor while the student is out of the room. At this time, the committee may ask for information to help them conduct an informed and constructive examination of the student. The student's laboratory performance, his/her exceptional abilities or deficiencies, or issues pertaining to the science may be raised. In addition, the committee should agree on how the exam is to be conducted, including whether the committee may stop the student to ask questions during their presentation or hold them for the end, and the degree of involvement by the mentor. The chair moderates the meeting to ensure that each committee member has adequate opportunity to ask questions and that the student is given time and consideration in answering. The chair may call on the student's mentor to resolve an issue, if necessary. When the examination of the student is completed, the chair asks the student to leave the room while the committee confers. The chair may also ask the mentor to leave the room at this time during deliberations.

The committee's decision takes two forms: a vote on pass/fail, and a written evaluation report. This report will state the committee's view of the strengths and weaknesses of the student and recommendations regarding the proposal. It will reflect the expressed opinions of all committee members.

#### Pass

All TAC members unanimously agree that the student has met the requirements to continue in the Ph.D. or M.S. program.

#### Fail

One or more TAC member indicate that the student has not met the requirements to continue in the Ph.D. or M.S. program. The committee has the right to recommend that a failing student be given the option to re-take the Qualifying Examination. A student may not re-take the exam without a recommendation from the committee to do so.

If the vote is "fail", the report will state if a second meeting or re-examination is recommended.

The Qualifying Examination/Thesis Proposal Evaluation report and the final version of the Thesis Proposal must be submitted to the GSBS Office to become part of the student's file and serve as documentation of the Qualifying Examination. When the Ph.D. student passes the Qualifying Exam, he/she is considered an official Ph.D. Candidate.

#### GUIDELINES FOR PROGRESS REPORTS (PhD and DO/PhD students only)

Ph.D. students enrolled in the Thesis Research course (which is the default course for PhD candidates that have passed their Qualifying Exam) must show progress in reports every fall and spring semester. One progress report occurs in conjunction with the annual oral student seminar and a thesis committee meeting. In the alternating semester, a written progress report by the student is submitted to the student's Thesis Advisory Committee. Each semester, the online *Thesis Research Evaluation* form is completed by all members of the Thesis Advisory Committee; the student also completes this form as a self-assessment. The *Thesis Research Evaluation* report describes the student's progress that semester and shares its results with the student and the GSBS office. As a result of this evaluation, a semester grade of Satisfactory or Unsatisfactory is assigned to the student. An Unsatisfactory grade constitutes violation of the Good Academic Standing policy and must be corrected at the end of the following semester. The student is dismissed if two consecutive Unsatisfactory grades are assigned.

The student's written progress report summarizes his/her accomplishments since the last report (or since the Qualifying Examination). The student writes the report, presents it to his/her advisor for approval, and then submits

it to each Thesis Advisory Committee member and to GSBS office. Students' oral and written progress reports are due approximately 3/4 into the semester.

The progress report must be understandable by all members of the Thesis Advisory Committee. Previous accomplishments may be mentioned, but recent work should be emphasized. It should not contain extensive background. However, names of reagents or procedures not familiar to people outside the student's laboratory should be described sufficiently. The report must have these three sections:

#### **Introduction and Specific Aims**

List briefly the specific aims indicated in the thesis proposal. If changes have been made to these aims, describe and explain those changes.

#### **Progress**

Describe the work carried out since the previous semester. Indicate results obtained, as well as any significant technical achievements. The student may present the development of a procedure, lessons learned, technical troubleshooting, etc., even if the experiments were not conclusive. Discuss how closely the work has followed the plans and timeframe of the previous progress report. If there were changes to those plans, explain them. Include figures, tables, and attributes. List presentations of the work by the student: talks, posters, abstracts, or papers.

#### **Plans**

Outline the plans for the next semester. Briefly describe specific goals, planned experiments and data expected to be collected. Indicate a timeframe required to accomplish each goal.

Include a title page, indicating "Progress Report", the title of project, the student's name, the advisor's name and date. All pages should have margins of no more than 1 inch, 1.5 spacing, and a font no smaller than Times New Roman 12 pt.

#### ANNUAL THESIS COMMITTEE MEETING (PhD and DO/PhD students only)

The Ph.D. and D.O./Ph.D. student must meet with his/her Thesis Advisory Committee at least once a year. This meeting typically follows the student's required public seminar. However, a student or mentor can request a meeting at any time and should, especially if the student's thesis project changes. At the meeting, it is advisable that the committee meet briefly with the mentor and the student separately. What is discussed at this time should be kept confidential. Similar to the Qualifying Examination, the committee decides how the meetings are conducted, the role of the chair in moderating the discussion, and the degree of involvement by the mentor. Based on the discussion, the committee may make specific requests of the student that have to be completed by a certain time or by the next progress report. *Thesis Research Evaluation* forms are completed by each of the Thesis Advisory Committee members online; the student also completes this form as a self-assessment. The evaluations of at least 4 Thesis Advisory Committee members are required to create the Thesis Research Evaluation Summary and provide the student with a grade of "S" for Satisfactory or a "U" for Unsatisfactory in the Thesis Research course each fall and spring semester. As with the Written Report evaluations, a U grade constitutes violation of the <u>Academic Standing – MCBN Program Policy</u>. It must be corrected at the end of the following semester or the student is dismissed.

#### THESIS DEFENSE CHECKLIST

Go to the Molecular Cell Biology and Neuroscience Program Thesis Defense Checklist to download the guide to finish the Ph.D. or M.S. program.

#### **GUIDELINES FOR DISSERTATION PREPARATION**

The dissertation is a written document in which the student summarizes their research and findings to meet the requirements of the doctorate. It is a substantial scholarly product that represents the culmination of the student's original and independent work that is designed to address specific and discrete scientific aims. The student has the primary role in conducting the research, preparing the findings, and in authoring the dissertation. Because the work in a dissertation is original, it is a unique product for each student. The content and form of the dissertation are

guided by the thesis advisory committee and the standards of the student's discipline. The dissertation may take a variety of scholarly forms, including a single monograph, or an ensemble of papers, essays, manuscripts or articles. While in most cases a dissertation will contain substantial unpublished results and text by the student, it is also acceptable to include unaltered co-authored papers or manuscripts. If so, the student should be a primary author of the paper, and its content should primarily reflect the results of the student's own unique specific aims. The title page for that chapter must clearly indicate that the chapter is published material and a citation must be provided. Any contributions of other authors must be explicitly acknowledged on the title page of each chapter as well as in the attributions section. These steps are particularly important in those rare circumstances where two students have both contributed substantially to the same paper and have been designated as co-first authors. However, because the goal of the dissertation is to report original work that conveys a cohesive but discrete message, each student is encouraged to modify such co-authored manuscripts for their individual dissertations to include only the work that is within the scope of their own specific aims and that is appropriately framed within the context of their own thesis project. Publications that are beyond the scope of the student's own dissertation in which the student played a smaller role can be placed in an appendix at the end of the thesis to highlight the student's achievements. Relevant background or content from those papers should be appropriately cited in the text as with other literature.

After completion of the dissertation research, the student prepares a dissertation in the format specified by the GSBS. Submit all final copies on 24 lb paper. Please see next section for details.

- 1. PAPER: standard size, 8 1/2" x 11" bond; 25% rag content (24 lb).
- 2. MARGINS: 1 3/4" from left; 1 1/4" from top; 1" from right and bottom.
- 3. TYPING SPACING: Single sided, double spaced throughout the text.
- 4. TITLE PAGE should contain:
  - Title in capital letters
  - Name of the candidate AND degrees already awarded, i.e. B.S., B.A., M.S.
  - The statement: "A Dissertation submitted to the Graduate School of Biomedical Sciences, Rowan University in partial fulfillment of the requirements for the Ph.D. Degree."
  - Two lines down from this statement is followed at the bottom of the Title Page by "Stratford, New Jersey 08084".
  - Two lines down from "Stratford, New Jersey 08084", place the "Month and Year" during which the thesis is being presented.
- 5. PAGE NUMBERING: All pages should be numbered consecutively except the Title Page. The Table of Contents page should be numbered as page 2.
- 6. FORMAT

**Table of Contents** 

Acknowledgments (include the sources of financial support)

Abstract (Not to exceed 350 words, double-spaced)

Introduction

Rationale

Materials and Methods

**Experimental Results** 

Discussion

**Summary and Conclusions** 

References

Appendix, Abbreviations list.

Attributes

Use a new page for each segment or division. Footnotes are allowed to be included at the bottom of the same page. Use standard abbreviations for chemical symbols, Journals, units of measurements.

#### 7. FIGURES, TABLES AND ILLUSTRATIONS:

- Should be numbered consecutively in Arabic numbers.
- Should include self-explanatory legends and title on the same page. If this is not feasible, use the next numbered page and turn the legend page so that it faces the figure.
- Type legends preferably 1 1/2" space.
- Do not use oversize tables, figures or illustration; if necessary, reduce to 5" x 8" overall.
- Insert figures, tables and illustrations as close as possible to the text describing the results.

#### 8. REFERENCES:

References may be arranged in the text either by mentioning the surname of the first (1-3) authors and year of publication, or by consecutive numbers in the order of citation.

Give the complete title and all co-authors (surnames and initials) of each paper included in the bibliography. Arrange in alphabetical sequence according to senior (co) author's surname, or in the numerical order of citation in the text.

Multiple lines of each reference should be typed single-spaced.

Allow double space between references.

#### 9. ATTRIBUTES OF THE THESIS:

A Figure-by-Figure description as to who specifically performed the experiment presented in each figure is required because multiple authorship papers are becoming more common and proper authorship must be declared.

#### **DEFENSE OF THE DISSERTATION**

Go here for Graduation Information including Graduation Application Deadlines.

Apply to graduate in Self-Service Banner. Rowan University confers degrees at the end of the Fall (December), Winter (January), Spring (May), and Summer (August) terms.

Submit your final written dissertation <u>draft</u> (formatting details above) to your Thesis Advisory Committee (TAC). All TAC members must approve it, using the <u>Dissertation Final Draft Vote</u> form, before you can set a defense date.

Once approved, email a pdf of your approved dissertation, the date (a minimum of 3 weeks or more <u>after</u> the approval date), and time of the defense to the GSBS Office group email address: <u>gsbs-stratford@rowan.edu</u>.

The GSBS office will:

- 1. Make the dissertation available to the entire faculty prior to the defense date.
- 2. Book SC-290 and publicly announce the defense date and time.
- 3. Review formatting of the written thesis.

On Defense Day, your TAC will complete the <u>Thesis Defense Vote</u> form after your defense to determine if you have passed. You will be notified in a timely matter regarding the outcome of your defense. If dissertation revisions are necessary, the chair of your TAC will contact you with instructions. Once the GSBS Office receives a fully executed Thesis Defense Vote Report, we will notify you to:

- 1. Submit a pdf of your final approved dissertation to the GSBS Office (gsbs-stratford@rowan.edu)
- 2. Submit 3 copies of the approved final dissertation on 24lb paper to the GSBS Office.\*
- 3. Complete the <u>Survey of Earned Doctorates</u> (doctoral students only)

Minor revisions must be completed within six months of the defense or the student may be required to re-defend.

GSBS stipend support is not guaranteed beyond one (1) month following a student's defense.

#### Final Written Dissertation\*

The GSBS Office will bind all of the required approved dissertations. The distribution of the thesis is as follows:

First copy: Graduate

Second copy: Mentor (thesis advisor)

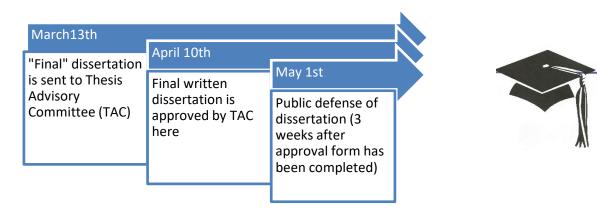
Third copy: GSBS Office

Fourth copy\*: Mentor-of-Record, if needed

Students can expect the bound copies to be available to them 1-2 months after submission.

#### GRADUATION, DIPLOMAS AND COMMENCEMENT

Doctoral students <u>must</u> successfully defend <u>before</u> Commencement to attend the Commencement Ceremony in May. Suggested sample timeline for May defense and walking at the ceremony:



Graduation Information may be found on the bottom of the GSBS Student Resources page. This includes:

- 1. Graduation Process and Important Deadlines
- 2. Graduation Application Instructions
- 3. Graduation vs Commencement
- 4. Commencement Information

All students must apply to graduate in Self-Service Banner. Rowan University confers degrees on the 30<sup>th</sup> day of December (Fall), January (Winter), May (Spring), and August (Summer).

The Commencement Ceremony is held in May. Please note that <u>NO</u> student will receive their diploma at Commencement. The student will receive their diploma approximately 8-12 weeks after the degree conferral term.

#### STAY CONNECTED

- ☐ Complete the <u>Alumni Registration Form</u>
- ☐ Enroll in LinkedIn, a professional networking site. It's free: https://www.linkedin.com

#### **ADDENDUM**

## MCBN PROGRAM ACHIEVEMENT MILESTONES AND DEADLINES ACADEMIC YEAR 2023-2024

Grad Year	Achievement milestones:	Good Academic Standing deadline:	Dismissal deadline:
1	Mutual Agreement with Mentor	DO/PhD: January 1 of 1st Year	June 15 of 1st Year
		PhD & MS: June 1 of 1st Year	
1	Thesis Advisory Committee (TAC) nominated and approved	July 1 of 1st Year	December 1 of 2 <sup>nd</sup> Year
1	Advisory Proposal Meeting (APM; DO/PhD & PhD)	September 15 of 2 <sup>nd</sup> Year	December 1 of 2 <sup>nd</sup> Year
2	Thesis Proposal/Qualifying Exam		MS: December 30 of 2 <sup>nd</sup> Year  DO/PhD & PhD: July 1 of 2 <sup>nd</sup> Year
	Complete and pass Thesis Research course (DO/PhD & PhD)	End of each semester (see below)	End of following semester**
3+	Thesis Research – Fall progress: Written report or Oral seminar	November 30, 2022	
3+	Thesis Research – Spring progress: Written report or Oral seminar	April 14, 2023	
3+	Thesis Research – Summer: No report or seminar required		
	Successful Thesis Defense		7 years (PhD) or 5 (MS) years from first matriculation

<sup>\*\*</sup> If a student does not pass Thesis Research, they must pass the following semester.