

EVMS School of Health Professions

Biomedical Sciences Research Master's Program

Student Handbook

2021-2022

CONTENTS

WELCOME 1

KEY PROGRAM CONTACT INFORMATION 2

PROGRAM POLICIES – Translational Sciences AND Biotechnologies Concentrations 3

THE HONOR SYSTEM 3

EVMS LABORATORY TRAINING REQUIREMENTS 3

EVMS SCIENTIFIC MISCONDUCT POLICY 3

STUDENT HEALTH INSURANCE 3

STUDENT DISABILITY SERVICES DISCLAIMER 3

FINANCIAL AID 5

OUTSIDE EMPLOYMENT & STIPENDS 5

ATTENDANCE POLICY 5

GRADING POLICIES - GRADING SCALE 5

 Pass/Fail Courses 6

 Course Syllabi 6

 Incomplete Grades 7

 Withdrawals 7

MINIMUM ACADEMIC STANDARDS 7

DROP/ADD POLICY AND PROCEDURE 8

TRANSFER CREDITS 8

ACADEMIC WARNING 8

ACADEMIC PROBATION 9

MISSING DEADLINES 9

DISMISSAL 10

APPEALING DISMISSAL 10

CURRICULUM POLICIES 10

 Finishing Requirements 10

 Turnitin Program Scanning of Major Writing Assignments 12

A. TRANSLATIONAL SCIENCES CONCENTRATION	13
(THESIS AND NON-THESIS)	13
CURRICULUM (SNAPSHOT OF COURSES AND SEQUENCE)	14
Year 1.....	14
Laboratory Rotations.....	14
Year 2.....	15
Advanced Elective Courses.....	15
Research Credits.....	16
DETAILED CURRICULUM	17
Year 1: Basic Biomedical Sciences and Research Skills.....	17
Year 2: Specialization.....	18
REQUIRED ACTIVITIES FOR BIOMEDICAL SCIENCES RESEARCH MS STUDENTS.....	23
Individual Development Plan (IDP).....	23
Research Grading Form.....	23
Documented Seminar Attendance.....	23
Attendance at Research Day, Graduate Student Research Conference.....	23
Course Evaluations.....	23
POLICY FOR BIOMEDICAL SCIENCES STUDENTS WISHING TO LEAVE A LABORATORY:	24
APPENDIX A: STUDENT CHECKLIST FOR RESEARCH MASTER’S STUDENTS: Translational Sciences Concentration	26
Fall Semester – Year 1.....	26
Spring Semester – Year 1.....	26
Summer Semester – Year 1.....	26
Fall and Spring Semester – Year 2.....	26
Summer Semester To End of Program.....	26
APPENDIX B: GUIDANCE COMMITTEES, WRITTEN & ORAL PRESENTATION REQUIREMENTS.	28
FIRST YEAR ADVISOR	28
INITIAL GUIDANCE COMMITTEE	28
GUIDANCE COMMITTEE: THESIS OPTION	29
GUIDANCE COMMITTEE: NON-THESIS OPTION	33
STUDENT OBLIGATIONS FOR COMMITTEE MEETINGS	35
APPENDIX C: THESIS FORMATTING AND SUBMISSION.....	38
FORMAT OF THESIS	38
STEPS TO FINALIZING THESIS	38
APPENDIX D: ADMINISTRATION AND PROGRAM FACULTY.....	39
EXECUTIVE COMMITTEE	39

PARTICIPATING FACULTY	39
B. BIOTECHNOLOGIES CONCENTRATION	41
CURRICULUM (SNAPSHOT OF COURSES AND SEQUENCE)	42
Year 1.....	42
Year 2.....	43
<i>CURRICULUM POLICIES</i>	43
Year 1: Basic Biomedical Sciences and Research Techniques.....	43
Summer Year 1 – Spring Year 2: Biotechnology Internship and Advanced Courses.....	44
Hours During The Internship	44
POLICY FOR STUDENTS WISHING TO LEAVE AN INTERNSHIP	45
REQUIRED ACTIVITIES FOR BIOTECHNOLOGY MASTER’S STUDENTS	46
Individual Development Plan (IDP).....	46
Documented Seminar Attendance	46
Attendance at Research Day, Graduate Student Research Conference.....	46
Course Evaluations	46
<i>APPENDIX A: BIOTECHNOLOGY concentration: STUDENT CHECKLIST</i>	48
FALL AND SPRING SEMESTER – YEAR 2	48
<i>APPENDIX B: RESPONSIBILITIES OF THE STUDENT’S ADVISOR DURING THE INTERNSHIP</i>	49
<i>APPENDIX C: ADMINISTRATION AND PROGRAM FACULTY</i>	50
EXECUTIVE COMMITTEE	51
PARTICIPATING FACULTY	51

WELCOME

We are excited that you are joining our program!

If your interest is in working toward discoveries in translational research and biotechnologies that explore health and disease in humans, Biomedical Sciences Research Masters' from EVMS can offer you the experiential learning you need to become an immediate contributor in the growing life sciences discovery in university or industry environments. We have two concentrations: Translational Sciences- focused on translational research in an academic laboratory; and, Biotechnologies – focused on research in biotech companies that offer real-life experience through internships. The Translational Sciences concentration has two tracks: thesis and non-thesis. After the first year core curriculum, students pursuing either track focus on laboratory research. Both tracks have a writing component in order to satisfy the graduation requirements.

Translational Sciences Concentration

The Translational sciences track provides comprehensive exploration of basic science, applied science, and lab science with an academic laboratory focus. The program will offer the opportunity to complete a capstone, group project in translational research and to work with clinical and basic science faculty involved in human disease research towards an original research thesis. This track will make students competitive for PhD programs and for lab scientist jobs in academia or R&D industry labs.

Biotechnologies Concentration

The Biotechnologies track provides comprehensive exploration of basic science, applied science, and lab science, with an industry focus. The program will provide students with a solid grounding in biochemistry, molecular biology, cell biology, genomics, and proteomics and will offer a real-life industry experience through a variety of internship options. This track will make students competitive primarily for R&D lab scientist jobs in biotech or pharma industries.

KEY PROGRAM CONTACT INFORMATION

The program is administered by the Program Director and the Executive Committee. The Executive Committee is composed of the Program Director, Admissions Committee Chair, and Curriculum Committee Chair. The Biomedical Sciences Program Office at EVMS provides administrative support for the program.

Program Director

Anca Dobrian, PhD, Lewis Hall 2126
Department of Physiological Sciences

(757) 446-5607
Email: dobriaad@evms.edu

Chair, Admissions Committee

Julius O. Nyalwidhe, PhD, Lester Hall 424
Department of Microbiology
& Molecular Cell Biology

(757) 446-5682
Email: nyalwijo@evms.edu

Chair, Curriculum Committee

Frank Lattanzio, PhD, Lewis Hall 3025
Department of Physiological Sciences

(757) 446-5636
Email: lattanfa@evms.edu

Program Coordinator

Diana Colon, MBA
Biomedical Sciences Program Office
Eastern Virginia Medical School
Lewis Hall, Rm. 2074
P.O. Box 1980
Norfolk, Virginia 23501

(757) 446-5076
Email: colond@evms.edu

PROGRAM POLICIES – TRANSLATIONAL SCIENCES AND BIOTECHNOLOGIES CONCENTRATIONS

THE HONOR SYSTEM

The EVMS Honor System is based upon the integrity of the individual. This system assumes that the student will accept his or her role in the EVMS community with self-respect and duty. Lying, cheating, and plagiarism will constitute violations of the Honor System.

Each piece of work submitted by a student is to be his or her own work unless prepared under other conditions specified by the course director. Enforcement of the Honor Code in the classroom is a responsibility shared by faculty and students. Instructors may, at their discretion, exercise the options of proctoring all types of examinations or arranging for others, including students, to proctor such examinations.

EVMS LABORATORY TRAINING REQUIREMENTS

Students participating in research at EVMS must complete the laboratory safety training required by the Office of Research. Required training includes Autoclave Safety, Chemical Hygiene, Biosafety, and Animal Research (CITI “working with the IACUC” and mouse modules). Information on these training courses will be given during orientation for new students and may also be obtained from the Office of Research. Depending upon the laboratory the student joins for their main research focus, it may be necessary to complete additional training requirements.

EVMS SCIENTIFIC MISCONDUCT POLICY

Students participating in research at EVMS must be familiar with and follow the EVMS Guide on Scientific Misconduct. Copies of the Guide are available from the Office of Research.

PROGRAM RESIDENCY

All students must spend at least two subsequent semesters of residency at EVMS, during which they must be enrolled full-time.

STUDENT HEALTH INSURANCE

All students enrolled in the program are required to have a health insurance policy with major medical and surgical coverage. Students may be covered by their own policy, or a parent’s or spouse’s policy, or enroll in the EVMS student health insurance policy. Those with other policies must obtain a waiver from the Office of Human Resources.

STUDENT DISABILITY SERVICES DISCLAIMER

EVMS is dedicated to providing reasonable accommodations to qualified students with a documented disability. The student must self-identify with the Office of Student Disability Services as having a disability to begin the accommodation process. It is in the best interest

of the student to begin the accommodation process as soon as you are aware that you may need them, as accommodations are not retroactive. All students must be able to fulfill the academic and technical standards of their academic program with or without reasonable accommodations; however accommodations are made available to aid in fulfilling those standards, not to waive them. If you have, or believe you have, a disability for which you wish to request accommodations under the Americans with Disabilities Act or Section 504 of the Rehabilitation Act, you must contact the EVMS Disability Officer:

StudentDisability@EVMS.EDU.

For more information about the disability accommodations process, please visit:
http://www.evms.edu/education/additional_resources/disability_guide_for_students/

FINANCIAL AID

Financial aid is available to Biomedical Sciences Research Master's Program students from the Financial Aid Office at Eastern Virginia Medical School. Students must meet the criteria established by the Office of Financial Aid and be in good standing to receive student loans.

OUTSIDE EMPLOYMENT & STIPENDS

Research Master's students are strongly discouraged from seeking outside employment if enrolled full-time. In exceptional situations, short term laboratory, research or teaching jobs may be permitted, but jobs requiring significant time away from the research laboratory will not be allowed. ***Any student considering outside employment must first obtain the approval of his/her Advisor and the Program Director.***

Research Master's students do not normally receive stipends. However, *an advisor may choose to offer a stipend up to \$10,000 per year to a student.* The stipend may be paid as soon as the student makes a commitment to the laboratory (March or June, Year 1).

ATTENDANCE POLICY

1. **Unexcused absences will not be allowed.** Course directors reserve the right to subtract credit points for unexcused absences to the extent specified in the syllabus for each course. Absences may be excused, at the discretion of each course director, if the student contacts the course director within 24 hours after the missed class. Documentation of illness or other emergencies may be requested at the discretion of the course director.
2. **Anticipated excused absences from an exam will require the student to take the exam before the rest of the class.** Eligibility to take a make-up exam or change the date of a scheduled exam will require documentation stating the reason for the absence. At the discretion of the course director, the make-up exam may have a different format and version than from the regularly scheduled exam. If the course director deems the excuse to be inappropriate, the course director may bring the issue to the Biomedical Sciences Curriculum Committee. The Committee will determine the eligibility of the student to be granted a make-up exam.

GRADING POLICIES - GRADING SCALE

Percentile	Grade
100 - 94	A
93 - 90	A-
89 - 87	B+
86 - 84	B
83 - 80	B-
79 - 77	C+
76 - 74	C
73 - 70	C-
69 - 67	D+
66 - 64	D
63 - 60	D-
59 or less	F

Pass/Fail Courses

A graduate student may earn pass/fail credit only in those courses so designated. At this time, only Thesis (BP 799) is designated as a Pass/Fail course.

Course Syllabi

Course Directors will provide students an official Course Syllabus (approved by the School of Health Professions Curriculum Committee) on **the first day of class**. The syllabus should be also be posted on the course's Blackboard shell, and handed out or emailed to students. The Syllabus must include a (1) **a Late Work policy** for assignments and take-home exams; (2) **Grading Policies** (e.g., how much each exam, quiz, assignment and participation will count) and a **Grading Scale** (or refer to the Health Professions grading scale in the Handbook). **Please ask the course director if you have any questions!**

Incomplete Grades

The grade “I” indicates assigned work yet to be completed in a given course or an approved absence from the final examination. When an instructor assigns a grade of “I,” a written agreement is prepared and signed by the instructor and student that specifies the work remaining to be completed and the time frame for doing so. The work should be completed as soon as possible, but not later than the mid-point of the following grading period/semester unless special written approval is granted by the Course Director and Program Director for extraordinary circumstances. The student must petition the Course Director and the Program Director for such an extension at least two weeks before the end of the agreed upon deadline. Unless an extension has been approved by the Course Director and the Program Director, the “I” will convert to either an “F” or the grade as specified in the written agreement after the mid-point of the semester. An “I” grade may not be changed to a “W” under any circumstances.

Withdrawals

A student can withdraw from a course up until the mid-point of the grading period/semester and receive a W grade. Withdrawal after the midterm is not permitted without special approval by the Program Director. However, in the event of an illness or severe hardship beyond the student's control, the student should submit a written petition for permission to withdraw from the course to the instructor and program director no later than the last day of classes. If permission is granted by the Program Director, a grade of W is recorded. If permission is not granted, then the student cannot withdraw from the class. A student who stops attending classes without withdrawing is assigned a WF grade unless the student's performance was failing, in which case a grade of F will be assigned.

MINIMUM ACADEMIC STANDARDS

To remain in good academic standing, the student must:

1. Maintain a cumulative GPA of 3.0 or greater on a four point scale.
2. Pass all required courses with a grade of “C-“or better, and meet other requirements within the time frames specified above.
3. A student must have a GPA of 3.0 or better to be awarded the M.S. degree. A student who completes the requirements for the degree but whose GPA is below a 3.0 may be permitted by the Program Director to take up to seven additional credits of coursework in an effort to increase the GPA to 3.0. Grades in courses accepted for transfer credit are not counted in the computation of grade point average. *Grade reports are available online.*
4. Extenuating circumstances: If the student believes there are extenuating circumstances why his/her performance has not met the minimum requirements of the program, he/she may submit a written petition to the Program Director explaining these circumstances. These will be presented to the Executive Committee. Considering their

recommendations, the Program Director will reach a decision and inform the student of it in writing. If the student's petition is rejected, the student will be subject to probation or dismissal from the program, as appropriate.

5. Students enrolled in the Biotechnologies Concentration must identify an Internship and an Internship Advisor ***by May 15th of the first year.*** The Program Director and faculty will help the student identify an appropriate laboratory internship.

DROP/ADD POLICY AND PROCEDURE

1. The deadline for withdrawal from courses will be the mid-point of the semester.
2. The student will fill out a Course Withdrawal Form, which must be signed by the student's advisor and the Program Director.
3. Any change in student status (e.g., from full time to part time; leave of absence; withdrawal) requires submission of a Student Status Change Form. Students receiving financial aid must confer with the Office of Financial Aid if their student status changes.

TRANSFER CREDITS

Requests to transfer graduate credits from another accredited US or Canadian institution are considered on an individual basis after students are admitted to the EVMS Biomedical Sciences Graduate Programs. International credits are reviewed on a case-by-case basis.

A student may transfer up to 6 graduate credit hours, if all of the following conditions hold:

- Graduate course credits were completed at an accredited US or Canadian institution and reflected on an official transcript;
- Transfers can feasibly occur within the matriculation limit of this Program;
- The grade earned is a 'B' or better; and
- Credits for the course were completed at a regionally accredited school or program in Biomedical Sciences.

All transfer requests must be made ***no later than one full term prior to graduation from the Program.***

Students wishing to request graduate credits to be transferred into the Biomedical Sciences Graduate Programs must submit a copy of the syllabus for the course and a Transfer Approval Request Form to the Program Director, who will consult with teaching faculty as appropriate. Requests are subject to the approval of the Program Director. Approved transfer grades are included on a student's transcript; however, transfer grades are not included in semester or cumulative GPA calculations.

ACADEMIC WARNING

An academic warning may be issued to a student who fails to meet program requirements,

or who misses deadlines for submission of required forms, course evaluations, etc. An academic warning will become part of a student's academic record. The Program Director will send the student a letter informing them of the requirements they have failed to meet, describing how they may fulfill the requirements, and indicating further actions that may be taken (e.g., academic probation) if the requirements are not met.

ACADEMIC PROBATION

1. If the **cumulative GPA falls below 3.0**, if a **student fails to meet program deadlines** as specified in this Handbook, **does not submit course evaluations in a timely manner** (see below), or **is not making adequate progress** in thesis research (see [Appendix B, section 4](#)), the student will be placed on academic probation. Probation serves as a warning that grades must improve and/or milestones must be met in a timely manner if dismissal is to be avoided.
2. No student may remain on probation more than two consecutive semesters. Failure to attain a cumulative GPA of 3.0 after two semesters of probation will result in dismissal from the program. Students dismissed from the program are not permitted to take additional Biomedical Sciences courses at EVMS.
3. A student must make academic progress during the first semester on probation (e.g., the GPA must increase) or be subject to dismissal from the program.
4. Any student who is placed on academic probation twice will be dismissed from the program unless there are extenuating circumstances as determined by the Program Director as advised by the Executive Committee.

The Program Director will make every reasonable effort to notify students of their academic status. A letter will be mailed to each student placed on probation or dismissed from the program. Since mail may be delayed or misdirected, it is the responsibility of every student whose GPA falls below 3.0 to check with the Program Director to determine his or her academic status. Non-receipt of a letter by a student placed on probation or dismissed will not be grounds for claiming eligibility to enroll for a subsequent semester.

MISSING DEADLINES

Meeting deadlines of the Program will help students develop professionalism. Students who fail to submit required documents or forms or to register for courses more 2 weeks after the deadline will be placed on [academic warning](#), and if the requirement is not completed 4 weeks after the deadline, the student will be placed on [academic probation](#). These actions will become part of the student's permanent academic record. **Continued failure to meet deadlines for an additional 2 semesters may result in further disciplinary action, up to and including dismissal from the program.**

DISMISSAL

No student may remain on probation more than two consecutive semesters. Failure to attain a cumulative GPA of 3.0 after two semesters of probation will result in dismissal from the program. Students dismissed from the program are not permitted to take additional Biomedical Sciences courses at EVMS.

APPEALING DISMISSAL

Reinstatement is generally not allowed, but special cases may be considered after a written appeal by the dismissed student to the Dean of the School of Health Professions, who will confer with the Executive Committee. Written appeals must explain (1) why the student is likely to succeed if reinstated, (2) how any deficiencies or extenuating circumstances have been resolved, and (3) present a plan for finishing the program.

CURRICULUM POLICIES

The Research Master's program is designed so that a well-qualified, highly motivated full-time student can complete it in two years. **All requirements for the degree must be completed within four calendar years from the date of matriculation.** Students receiving federal student loans are required to complete their requirements within three years. Exceptions must be approved by the Program Director and the Dean of the School of Health Professions. Students whose graduate study is interrupted for military service will be granted an extension for the period of their service, not to exceed five years. Leaves of absence from the program are limited to one year, and must be approved by the Program Director and the Office of Student Affairs.

Finishing Requirements

Translational Sciences Concentration:

Research Master's students choosing the Thesis Option should complete all of their requirements prior to leaving campus. In the event that they are unable to do so, students are required to defend their thesis within **2 months** of leaving campus. The final thesis must then be submitted within **2 months** of the defense. If the student does not follow this timeline, no degree will be granted.

Similarly, Research Master's students choosing the Non-Thesis Option are required to submit their RESEARCH REPORT, give their Oral Presentations, and have their final Guidance Committee meetings within 2 months of leaving campus.

Students should submit their THESIS or RESEARCH REPORT to the Program Office and their committees one month prior to the beginning of the new semester, or they will be required to register for 1 credit of Thesis or Research until all degree requirements have been met.

It is highly recommended that the student fulfill all requirements prior to leaving EVMS!

Biotechnologies Concentration:

Research Masters' students choosing this concentration must complete the curricular requirements that include the biotechnology bundle classes in Spring of first year and two internships before the end of the Spring semester of Year 2. After the second internship the students must return to EVMS campus and present the projects completed during their 2 internship tenures.

Turnitin Program Scanning of Major Writing Assignments

PURPOSES

1. To teach students proper ways to cite and use material from others' work.
2. To teach students the difference between citation, quotation, and plagiarism.
3. To ensure that students' writing assignments do not contain plagiarized material.

PROCEDURE

1. Students will be taught how to use the Turnitin program to ensure they have not unintentionally plagiarized.
2. Turnitin reports showing little or no similarity to published work or internet sources identified by the program must be submitted along with the following major writing assignments:
 - a. Assignments and exam essay questions as requested by Course Directors
 - b. Research proposal for Scientific Writing and Research Design (year 2)
 - c. [Thesis Proposal](#) and Thesis (year 2) OR [RESEARCH REPORT](#) (year 2)
3. Short phrases or standard descriptive wording of concepts or lists of items are acceptable, even if they are identical to phrases in published works of others.
4. Phrases or sentences longer than a few words that are very similar to published material, or which have had a small number of words changed, will not be allowed. **Students must put ideas into their own words, even if the ideas come from published work (which should be properly cited).**
5. Quotation should be discouraged, except in rare instances when a quotation is unique, historical, or expresses a new and important idea.
6. All results or ideas of others should be properly cited. **The correct article(s) and/or book chapter(s) in which the results or ideas were published should be cited** for each of these.

**A. TRANSLATIONAL SCIENCES CONCENTRATION
(THESIS AND NON-THESIS)**

CURRICULUM (SNAPSHOT OF COURSES AND SEQUENCE)

Year 1

All students will take the following courses in Fall and Spring:

FALL SEMESTER

BP 700: Molecules to Cells	2 credits
BP 701: Molecular and Cellular Techniques	2 credits
BP 703: Cell Communication and Signaling	3 credits
BP 704: Molecular Genetics	1.5 credits
BP 710: Oral Communication Forum	1 credit
BP 719: Lab rotation I	2 credits
Total	11.5 credits

SPRING SEMESTER

BP 706: Cell Energetics and Organ Function	3 credits
BP 781: Applied Biostatistics and Bioinformatics	3 credits
BP 710: Oral Communication Forum	1 credit
BP 720: Lab rotation II	2 credits
Total	9 credits

SUMMER SEMESTER

BP 798	Research	3 credits
Total		3 credits

Laboratory Rotations

All students will complete two eight-week laboratory rotations (BP 719, BP 720, in two different laboratories) during Fall and Spring of Year 1. Each laboratory rotation will consist of a minimum of 120 hours of laboratory work (**15 hours per week**).

Year 2

FALL SEMESTER

BP 771: Methods & Logic in Translational Biology	4 credits
BP773: Responsible Conduct in Science	1 credit
BP 709: Scientific Writing and Research Design	1 credit
BP 710: Oral Communication Forum	1 credit
BP798: Research	3 credits
<u>Electives (2-3 credits, as available)</u>	<u>2-3 credits</u>
Total	10-13 credits

SPRING SEMESTER

Students may take their elective credits during this semester; however, the new curriculum has been developed to provide more dedicated time in the laboratory for students to concentrate on their research (BP798).

SUMMER SEMESTER

Most students will complete their THESIS or RESEARCH REPORT during this summer semester. See [Finishing Requirements](#) for more details on the timing of completion (BP798, BP799).

Advanced Elective Courses

1. Research MS students are required to complete **at least 2 credits** of elective coursework.
2. The student's advisor must meet with the student to discuss which course(s) would best serve the student's educational interests.
3. The advisor must email the Program Director to inform him or her that they have discussed the requirement with the student and
4. The student and advisor must specify the advanced course(s) chosen (at least 2 credits) which the student will take, which will better serve their training. Alternative advanced courses include Special Topics (independent study with the advisor or other faculty); courses from other EVMS programs, and Biotechnology Program courses listed in the Handbook; and appropriate graduate courses at ODU or NSU.
5. Please take time to plan in advance, as not all elective courses are offered every semester. Some may not be offered more frequently than every other year. Additional electives may become available after the publication of this Handbook, and be available to students after they are formed.

<u>BIOMEDICAL SCIENCES GRADUATE COURSES</u>	Credits
BT719: Advanced Molecular and Cellular Techniques* (Spring)	2
BT709: Proteomic Technology (Spring)*	2
BT707: Microscopy and Imaging Techniques (Spring)*	2
BT711: Flow cytometry (Spring)*	2
BP795: Special Topics	2
BP 780: Writing Elective	1
BP 770: Neuro-immunology	3

<u>OTHER EVMS/ODU/NSU COURSES</u>	Credits
MPH 614: Principles of Epidemiology	3
MPH 727: Organizational Management	3
MPHE 624: Data Management with SAS	3
MPHE 737: Infectious and Chronic Disease Epidemiology	3
MPHE 501: Instructional Methods	3
MALS 502: Comparative Anatomy and Physiology (online)	3
RCS 806: Developmental Biology (online)	3
CS 723/823: Introduction of Bioinformatics (ODU)	3
Introduction to Genomics and Bioinformatics (ODU)	3
Computational Biology (ODU)	3
Advanced Bioinformatics (ODU)	3
Practical Computing for Biology (ODU)	3
Chromosome Biology and Human disease (ODU)	3
MPHE 808-Sociocultural Contexts of Teaching and Learning (ODU)	3

NOT ALL ELECTIVE COURSES ARE OFFERED EACH SEMESTER OR EACH YEAR

Research Credits

All students must complete a minimum of 12 credits of Research and Thesis [BP799].

DETAILED CURRICULUM

Year 1: Basic Biomedical Sciences and Research Skills

The [Incoming Faculty Mentor](#), which will be matched with the student upon matriculation, or Program Director will advise each student about required coursework. During the first year, the student must satisfactorily complete all required courses, including two laboratory rotations. Up to 6 credits of graduate courses taken at other institutions can be transferred into the curriculum of each student at the discretion of the Initial Guidance Committee (see [Appendix B](#) for description of this committee's role).

RESEARCH LABORATORY ROTATIONS

During Year 1, the student completes two to three research laboratory rotations.

Each student must complete two research laboratory rotations, each in a separate laboratory. This requirement may be waived if the [Initial Guidance Committee](#) agrees.

1. Each laboratory rotation will be for an 8 week period and requires **at least 120 hours** of lab time (**15 hours/week**). Given the course load during the first year, it is recommended that students **no spend more than 20 hours/week** in the lab.
2. The rotations must be completed by the end of the first year.

ADVISOR & GUIDANCE COMMITTEE

By **June 1** following the completion of Year 1, each student will select an advisor.

With the help of the advisor, the student will select a [Guidance Committee](#), by **June 15**. It is recommended that the [Incoming Faculty Mentor](#) be considered when developing the Guidance Committee in order to maintain continuity in the student's training. The Committee should advise the student on additional advanced courses for the second year, and will guide the student in a research project. Please submit the "GUIDANCE COMMITTEE" form to the Program Office **by July 1**.

HOURS IN THE RESEARCH LABORATORY

Research is a full-time job and students should be highly motivated, without a requirement for a minimum number of hours to be worked. Students are required to be in their research laboratories full-time and should work a **minimum of 40 hours per week**, minus required class attendance hours. To make progress in their research, **most students will find it necessary to work longer hours, including evening and/or weekends**.

Year 2: Specialization

During Year 2, the student will satisfactorily complete both the remaining required courses, as well as **elective courses** approved by their Guidance Committee. The student will work with their Guidance Committee to determine with Option they will pursue. Students will meet with their advisors to determine their Guidance Committee. Regardless of Option chosen, the student will meet with their Guidance Committee by **October 15** in the Fall semester of Year 2. Minutes of this meeting, along with the Thesis/Non-Thesis Option form is to be submitted to the Program Office no later than November 1. **This form is a binding commitment to the Thesis or Non-Thesis track.**

THESIS OPTION

The student forms a Guidance Committee, prepares and presents a written Research Proposal by **February of Spring Semester, Year 2**. At the conclusion of the thesis research, the student will **write and defend a thesis**. Detailed requirements for the proposal and policies governing the **Guidance Committee** (see [Appendix B](#)), as well as detailed requirements for the thesis, defense and approval are found in [Appendix C](#).

Masters Thesis Committee Overview

The purpose of the Masters Thesis Committee is to help set research goals and directions, while assessing progress toward the completion of an original body of research appropriate for completion of a Masters dissertation. At a minimum, the data generated should comprise two original Figures towards an original research manuscript; and should be sufficient to grant the student an authorship right on the manuscript.

Overall, the major goals of the Masters Thesis Committee are to:

1. Critically assess the student's progress in both a specific research project and development as a scientist;
2. Provide advice and assistance to the student to overcome hurdles to progress in either area;
3. Assure that the student's research project remains focused within a reasonable scope;
4. Guide the student toward completion of the project in a timely fashion, resulting ideally in co-authorship on a research publication.

Masters Thesis Committee Membership

The student should work closely with his or her thesis advisor (PI) on the composition of the Thesis Committee. The committee must include the Masters thesis advisor, **but this person may not serve as Chair**. The Chair must be of Associate Professor rank or higher, and must be a member of Biomedical Sciences Graduate Faculty. The Chair also cannot be a close collaborator with student's advisor. The committee must also include at least two other faculty

that are members of the graduate program. *Once the committee members are selected, they must be approved by the Biomedical Science Program Director.*

All committee members should have expertise enabling them to provide critical and helpful advice in the area of the thesis. Committee members must also be willing to read and evaluate the thesis.

The committee should serve the needs of the student. As projects proceed in new directions, perspective changes, or the student feels the committee is not meeting his/her needs, the composition of the committee can be changed without embarrassment by the student in consultation with his/her Masters thesis advisor and the Program Director.

II. Meetings of Masters Thesis Committee

The student is responsible for organizing an initial meeting of the committee, ideally within one month of formation of this committee, but in any event no later than October 15 of the 2nd year. Subsequent meetings of the committee include:

- defense of thesis proposal no later than March 1 of the 2nd year
- presentation seeking for approval of the final defense of thesis no later than June 1st of the 2nd year

The program will not process paperwork for enrollment and stipend support for students who have not done so unless the program director has approved an exception. The student is responsible for organizing all of these meetings. (If student fails to meet this responsibility, the program will intervene). Either the student or committee may initiate more frequent meetings as needed. Meetings may be held when necessary without all committee members.

III. Responsibilities of the Student

For each meeting, the student is responsible for preparing a written summary outlining the thesis project, progress on this project and objectives for completion of the thesis. This should include a timetable. The summary should make clear what would be necessary to constitute an acceptable Masters thesis, in the student's view. A copy of this summary is to be given to each member of the thesis committee and to the Graduate Program Office. Students should present and discuss critically experiments (successful or unsuccessful) at each meeting. Students should be current on the literature in relevant areas and should be prepared to discuss broader issues of relevance and importance as well as experimental data.

IV. Responsibilities of the Advisor (PI)

The thesis advisor should provide a verbal or written preliminary evaluation to the student of the adequacy of the written summary prepared for each committee meeting. The advisor should provide both the student and committee with his/her evaluation of the student's progress and prospects.

V. Responsibilities of the Committee

The Committee should provide candid advice to both the student and advisor with the goal of facilitating progress towards the best possible Masters thesis, scientific development of the student, as well as a timely progression toward the thesis defense. The committee should explicitly decide whether the summary of the Masters thesis project describes goals adequate for award of a Masters' degree and communicate this decision with any modifications or reservations to the student and advisor.

The committee should consider at each meeting:

- project strengths and weaknesses
- the realism of the time table
- the student's familiarity with the relevant literature
- student's experimental strengths and weaknesses
- the adequacy of advice provided to the student by the thesis advisor and others.

The committee should provide advice in as positive a manner as possible to provide as much support as possible to the student in what is a very time sensitive undertaking.

The committee has the responsibility, particularly for thesis projects that may be overly ambitious, to set deadlines for obtaining significant results that would allow timely graduation. Between meetings, the committee members will be willing to meet with the student for informal advice and discussions.

The committee, excluding the thesis advisor, has the responsibility at each meeting to meet separately with the thesis advisor and student at the beginning or end of the meeting to have confidential discussions on any subjects relevant for the student's progress and welfare.

VI. Responsibilities of the Committee Chair

The committee chair should prepare a brief written report on each meeting for submission to the Graduate Program office. This report will include among other things, a statement on the timetable and the adequacy of the student's statement of proposed work necessary for an acceptable Masters thesis. The chair should meet separately with the student and advisor after each meeting to discuss this report and other aspects of the meeting. While advice should be provided in as positive a manner as possible, the chair has the responsibility of identifying potential and actual problems and ensuring that candid advice on the project and/or the student's progress and prospects is conveyed to the student and the program.

The chair has the responsibility to ensure that any concerns about the student's interests or welfare in his or her laboratory are conveyed to the Biomedical Sciences Program Director and Executive Committee. The chair should be acquainted with services provided by the Medical School and the Graduate Program to enhance student welfare and should facilitate student use of these services when appropriate

The student should meet with their committee by **October 15** in the Fall semester of Year 2 to discuss their project (outline of Thesis Proposal). The **Thesis Proposal** must be submitted to the Committee by **February 1**, and approved and defended by the committee by **March 1 of Year 2**. Students are expected to complete the writing and defense (oral presentation) of their Thesis by the **Summer of Year 2** of the program. **Usually, Thesis Option students register for 1 credit of Thesis in Summer semester (beginning of Year 2) and defend their theses in July or August.** The student will present a seminar defending their thesis prior to meeting with their committee for the closed committee meeting. Students will be required to register for 1 credit of THESIS if they have not submitted their thesis to the Program Office and their Guidance Committee 30 days prior to the start of the new semester. Students will have **30 days** from the date of the THESIS defense to complete all graduation requirements. Otherwise, they will be required to register for 1 credit of THESIS.

NON-THESIS OPTION

The student should meet with their committee by **October 15** in the Fall semester of Year 2 to discuss their project. See [Appendix B](#) for more details.

Students will be required to write up a formal summary paper of their research (**RESEARCH REPORT**) that includes detailed methodology and explanations of the data gathered.

Students must present a full-length public **oral presentation (30-60 minutes in length)**, **followed by a meeting with their committee** to answer questions on their research before **completion of the program (usually at the end of Spring semester, beginning of Summer semester)**, and **submit their laboratory notebooks to their advisors.**

The RESEARCH REPORT, presentation, and notebook must be acceptable to the committee and advisor, who must certify completion of these requirements on the appropriate form in order for the student to fulfill all the requirements for degree completion. If a student has not completed these requirements 30 days prior to the start of the next semester, they will be required to register for 1 credit of RESEARCH.

REQUIRED ACTIVITIES FOR BIOMEDICAL SCIENCES RESEARCH MS STUDENTS

Individual Development Plan (IDP)

An IDP must be completed annually by each student, second year and above. The purpose of this form is to aid the student in developing their career plan, and explore their goals as they develop and grow as scientists over the course of the program. By submitting this plan each year, both student and mentor have the opportunity to revisit the student's goals, and make changes to the student's path as needed. The form will be submitted by the student to the student's advisor. The student and advisor will then meet to review the student's career goals and the progress they are making towards them. The final plan will be approved by the advisor, and **must be submitted to the Biomedical Sciences Program office by December 15.**

Research Grading Form

This form, which is filled out at the beginning and end of the semester, will enable the mentor and student to determine if goals have been met over the course of a semester. This will provide a more objective means for determining grades for the research effort. This completed form should be submitted at the end of each semester starting with the Summer semester of Year 1. Additionally, this will help the Guidance Committee in focusing their discussion on the student's research, and recently completed forms should be shared with the Guidance Committee.

Documented Seminar Attendance

Students are required to attend **FIVE (5)** basic science seminars, rather than clinical presentations, given by faculty-level scientists (Ph.D. or M.D.) at EVMS, ODU, and LifeNet Health. Students are required to file a form that will be *submitted to the Program Office monthly. Students who do not submit forms within 2 weeks of the end of the academic year will be placed on [academic warning](#), and if the evaluations are not submitted 4 weeks after the end of the academic year, they will be placed on [academic probation](#).*

Attendance at Research Day, Graduate Student Research Conference

Attendance at Research Day (mid-October) and Graduate Student Research Conference (Spring) is required, and will be documented with a sign-in sheet. Students must attend the entirety of both events. Students who do not attend will be put on academic warning. Extenuating circumstances must be approved by the Program Director. Students will be required to provide documentation of said absence.

Course Evaluations

Students are **REQUIRED** to submit course evaluations for all courses taken. ***Students who do not submit course evaluations within 5 days of the end of a semester will be placed on [academic warning](#), and if the evaluations are not submitted 4***

weeks after the end of a semester, they will be placed on [academic probation](#). These actions will become part of the student's permanent academic record. Continued failure to submit course evaluations by the deadline for an additional 2 semesters may result in further disciplinary action, up to and including dismissal from the program.

POLICY FOR BIOMEDICAL SCIENCES STUDENTS WISHING TO LEAVE A LABORATORY:

1. A conflict or problem that cannot be resolved between an advisor and a student should be reported to the Program Director by either party.
2. The Program Director (PD) will meet with the student and advisor to try to resolve the problem.
3. If the problem is not resolved, the student and advisor will be required to meet with the student's Guidance Committee and the PD or other EVMS officials, as appropriate.
4. If, after attempts to resolve the conflict or issue, either the student or the advisor wishes to terminate the mentoring relationship, a written request must be submitted to and approved by the PD. The request should give reason(s) why the mentoring relationship should end.
5. If the student wishes to leave a laboratory, the advisor and the PD must receive written notice of termination of the mentoring relationship. The student will leave the lab at a date mutually agreed on by the student and the advisor, but the maximum time after giving the PD written notice will be 90 days. The student will continue to perform research in the mentor's laboratory until the termination date.

Appendices for Biomedical Research Masters' Students

Concentration in Translational Sciences

APPENDIX A: STUDENT CHECKLIST FOR RESEARCH MASTER'S STUDENTS: Translational

Sciences Concentration

Fall Semester – Year 1

- Acknowledge receipt and reading of Student Handbook
- If necessary, meet with the Initial Guidance Committee to determine if any required courses can be waived because of prior equivalent graduate course work
- Meet with Initial Faculty Mentor **once a month** to discuss coursework and rotations.
- September:** Set up laboratory rotations in advance

Spring Semester – Year 1

- Meet with Initial Guidance Committee to discuss lab rotations and selection of Option and an advisor
- Continue Courses and complete at least two Laboratory Rotations

Summer Semester – Year 1

- June 1:** Choose **Faculty Advisor**
- June 15:** Set up Guidance Committee; seek guidance from Committee members on Year 2 courses
- July 1:** Submit Committee form to Program Office

Fall and Spring Semester – Year 2

- October 15:** Meet with your Committee in Fall semester to discuss project
- November 1:** Submit Committee meeting form and minutes to Program Office within 2 weeks of meeting; submit choice of **Thesis/Non-Thesis Option** (this is binding!)
- January:** Application for Graduation – January prior to May graduation. To participate in ceremony, student must be expected to complete requirements by August 15
- March 1: Thesis Option:** Defense, revision and approval of **Thesis Proposal**
- Non-thesis option:** Chalk talk or seminar sponsored by the student's department
- Non-thesis option:** Complete Oral Presentation to Committee, submit RESEARCH REPORT, and submit Lab Notebooks to Advisor. All components must be deemed acceptable by the Committee to meet degree requirements! *Submit signed form and minutes to Program Office*

Summer Semester To End of Program

- Thesis Option:** Complete research and thesis. Submit thesis to Committee 3 weeks before defense
- Non-Thesis Option:** Complete research and written report. Submit report to Committee 3 weeks before oral presentation.
- Set up Thesis Defense and inform Program Administrator 3 weeks in advance

- Thesis Defense/Oral Presentation:** *Submit signed form to Program Administrator within 10 days*
- Final approved version of thesis/research report must be **approved for formatting** by Program Director and Administrator. The **Turnitin report** must also be approved
- The original Thesis and 1 or more copies are submitted for binding. **Submit Thesis Approval form**
- Exit interview** with Program Director (***Required***)
- Approval for award of the Master's degree by Program Director
- Distribution of final bound copies of Thesis by student and Program Administrator

APPENDIX B: GUIDANCE COMMITTEES, WRITTEN & ORAL PRESENTATION REQUIREMENTS

FIRST YEAR ADVISOR

The Program Director, along with an optional mentor (Incoming Faculty Mentor), will serve as the Advisor for first year students.

INITIAL GUIDANCE COMMITTEE

The Initial Guidance Committee consists of the Executive Committee of the Program, or other faculty members appointed by the Program Director (including the student's Incoming Faculty Mentor). The Guidance Committee will counsel first year students about required and elective coursework and choosing an advisor for their research.

The roles of the Initial Guidance Committee include:

1. *Determine the student's academic background.*

The Program Director will review the student's previous training and identify any previous graduate courses that may be substituted for required courses. The Program Director will review recommendations with the Initial Guidance Committee prior to the beginning of fall semester.

2. *Determine the student's objectives in the program and career goals.*

The student's objectives in the program and goals upon graduation are related. It is essential to know these goals to schedule appropriate coursework and to give guidance concerning research and training opportunities at EVMS.

3. *Provide guidance to satisfy the student's goals while meeting all the program requirements.*

In the Spring Semester of Year 1, the Initial Guidance Committee will meet with the student to review the student's goals and assist the student in selecting the appropriate option (Thesis or Non-Thesis) and research advisor.

4. *Counsel the student in the early phases of research (as needed).*

The program encourages students to begin exploring their research interests at the earliest opportunity to facilitate selection of a research mentor and thesis project. The student should utilize the Initial Guidance Committee for counsel on research activities prior to choosing an advisor.

GUIDANCE COMMITTEE: THESIS OPTION

This Committee must be set up for each student by **June 15** in the Summer of Year 1, following selection of a research Advisor. The Guidance Committee form is to be signed by the committee members and submitted to the Program Director by **July 1**. The Guidance Committee must be composed of at least four Biomedical Sciences Program faculty members. Additional members may be added who are not program faculty, but who have special expertise of value for the thesis research. These members must have an appointment at an academic institution. **The student's advisor must be part of the Guidance Committee but cannot be the Chair of the committee.**

The Guidance Committee shall counsel the student during the research and thesis phase of their training. Additionally, the Guidance Committee shall provide career counseling to help the student achieve career goals.

The committee will:

1. Determine the student's research interest.
 - a. The student and the Research Advisor will identify a feasible project in an area of mutual interest.
 - b. A brief project description (may be the Thesis Proposal Outline/Specific Aims) should be presented orally to the Guidance Committee for comment, modification and approval in the Fall Semester of Year 2. It is recommended that this is completed earlier in the semester to facilitate the timing for a thesis-option student.
2. Counsel and aid the student during the research phase through Committee Meetings
 - a. The Guidance Committee will guide the student during the thesis research phase, help solve problems, and help the student with technical difficulties arising with their project. However, the work is to be the student's own and the research must be on an original and significant problem.
 - b. The Guidance Committee will meet with the student at least once in the Fall Semester of Year 2 to review the student's progress, help hone the thesis proposal outline, and respond to problems or questions the student has.
 - c. The Guidance Committee will utilize the "RESEARCH GRADING FORM" from the Summer and Fall Semesters of Year 2 to assess the student's progress. These questions should be considered by each student prior to meeting with their committees:
 - i. What are your major research accomplishments since the last committee meeting?

- ii. What are the major challenges you face in your project, and how do you plan to overcome them?
 - d. The Committee will meet with the student by February of Year 2 to review the “THESIS PROPOSAL” (section 3 below). The Committee will also administer the “THESIS DEFENSE” (section 6 below). If additional meetings are held, the student will make an oral presentation of progress and discuss any significant problems that have arisen, to obtain constructive criticism from the committee. At the conclusion of each meeting, the committee may excuse the student to discuss the acceptability of the student’s progress.
3. Counsel the student in the preparation of the THESIS PROPOSAL
- a. The Guidance Committee will guide Thesis Option students by constructive review in developing a detailed THESIS RESEARCH PROPOSAL. The proposal must be provided to the Committee by February 1 of Year 2, and will consist of:
 - i. A complete **one-page Specific Aims section**, including **Rationale, Hypothesis to be tested, Aims**, and a general statement of **Approaches to be used**;
 - ii. An outline of the **Experimental Plan**, including the experiments to be done for each aim and specific techniques to be used in the experiments
 - b. The student will make an **oral slide presentation** of the background, aims and research plan of their project to their committee by February 15 of Year 2.
 - c. The student will submit to the Program Office NO LATER THAN MARCH 1:
 - i. The final approved Proposal outline, as described above;
 - ii. The completed “RESULT OF M.S. REQUIREMENT” signed by all committee members.
 - iii. It is highly recommended that the student complete this process well before the March 1 deadline.
 - d. The student’s proposal and oral presentation must both be acceptable to meet this requirement. The thesis research must be original and creative, and demonstrate an understanding of the scientific method. Before completing the Program, the student must register for at least 3 credits of Thesis, **BP799**.
4. Ensure that the student continues to make progress on the research project.
- a. A student whose research progress is found to be unsatisfactory by a majority of the committee shall be placed on [academic probation](#).
 - b. The student will then be given a minimum of three months and a maximum of one semester to address the concerns specified by the Committee. At the end of the

probationary period, the committee will meet again with the student to determine if the student's progress is satisfactory.

- c. If it remains unsatisfactory, the Committee Chair will report this to the Program Director. The student will be dismissed from the program unless the student successfully appeals the decision to the Program Director.
5. Counsel the student during the thesis writing and presentation phase.
 - a. After the thesis research is completed, the student will write a thesis. The student should follow the current guidelines for writing theses (see [Appendix C](#)), which can be obtained from the Program Administrator or Program Director. Although the writing is to be reviewed and criticized by the Advisor and the Guidance Committee, the writing must be the student's own. The thesis should be submitted to committee members **at least three weeks before the defense**. The thesis should be in near-final form prior to scheduling the oral defense.
 - b. The thesis must also be submitted to the Program Administrator to check formatting and to the Turnitin Program within this time frame (see [Turnitin Program Scanning of Major Writing Assignments](#) policy on page 9).
 - c. The final version of the thesis is submitted to the Program Director and the Program Administrator for approval following any corrections required after the Oral Thesis Defense.
 6. Administer the thesis defense.
 - a. The aim of the defense is to explore with the candidate the methodological and substantive contributions of the thesis. The time, date, and place of the thesis defense will be provided to the Program Administrator and Director by the student three weeks in advance.
 - b. The Program Coordinator will notify the program faculty, students and administrators at EVMS of the date of the defense at least two weeks in advance. The location is chosen by the student and the Advisor, and should have sufficient room for at least 20 people to attend. The Program Coordinator can assist in finding a room.
 - c. The defense will consist of an oral presentation of the student's research. It is open to the entire EVMS community, followed by a question period for the audience. The audience is then excused, and the student and Committee meet for further examination and questioning by the committee. The student is then excused and the committee members discuss the student's performance. If more than one committee member votes to fail the student, the result will be a failure. The student is then informed of the decision.
 - d. The result will be reported to the Program Director using the form "RESULT OF M.S. REQUIREMENT (Proposal or Thesis Defense)" within 10 days. In case of failure, the committee may recommend that the student be dismissed from the program or

that the student be permitted a re-examination no earlier than three months after the first defense.

7. Approval of the Thesis. The Advisor and Guidance Committee are responsible for giving the final content approval of the Thesis. Approvals of the formatting and reports are the responsibility of the Program Director and Coordinator.

GUIDANCE COMMITTEE: NON-THESIS OPTION

This Committee is to be set up for each student by June 15 in the Summer of Year 1, following selection of a Research Advisor. The Guidance Committee form is to be signed by the committee members and submitted to the Program Director by July 1. The Guidance Committee must be composed of at least four Biomedical Sciences Program faculty members. Additional members may be added who are not program faculty, but who have special expertise of value for the thesis research. These members must have an appointment at an academic institution.

The Guidance Committee shall counsel the student during the research and thesis phase of their training. Additionally, the Guidance Committee shall provide career counseling to help the student achieve career goals.

The committee will:

1. Determine the student's research interest.
 - a. The student and the Chair of the Guidance Committee (Research Advisor) will identify a feasible project in an area of mutual interest.
 - b. A brief project description should be presented orally to the Guidance Committee for comment, modification and approval in the Fall Semester of Year 2.
2. Counsel and aid the student during the research phase through Committee Meetings
 - a. The Guidance Committee will guide the student during the thesis research phase, helping solve problems, and helping the student with technical difficulties arising with their project. However, the work is to be the student's own and the research must be on an original and significant problem.
 - b. The Guidance Committee will meet with the student at least once in the Fall Semester of Year 2 to review the student's progress and respond to problems or questions the student has.
 - c. The Guidance Committee will utilize the Research Grading Forms from the Summer and Fall Semesters of Year 2 to assess the student's progress in the first meeting. These questions should be considered by each student prior to meeting with their committees:
 - i. What are your major research accomplishments since the last committee meeting?
 - ii. What are the major challenges you face in your project, and how do you plan to overcome them?
3. Ensure that the student continues to make progress on the research project.
 - a. A student whose research progress is found to be unsatisfactory by a majority of the committee shall be placed on academic probation.

- b. The student will then be given a minimum of three months and a maximum of one semester to address the concerns specified by the Committee. At the end of the probationary period, the committee will meet again with the student to determine if the student's progress is satisfactory.
 - c. If it remains unsatisfactory, the Committee Chair will report this to the Program Director. The student will be dismissed from the program unless the student successfully appeals the decision to the Program Director.
 4. Counsel the student during the RESEARCH REPORT writing and presentation phase.
 - a. After the research is completed, the student will write a RESEARCH REPORT. The student should follow the current guidelines for writing theses (see below in "[STUDENT OBLIGATIONS](#)" section 7 & [Appendix C](#)), which can be obtained from the Program Administrator or Program Director. Although the RESEARCH REPORT is NOT a THESIS, the formatting required is the same as that used for a data chapter in a THESIS. The writing is to be reviewed and criticized by the Advisor and the Guidance Committee, but must be the student's own. The RESEARCH REPORT should be submitted to committee members **three weeks before the Oral Presentation/FINAL Committee Meeting**. The RESEARCH REPORT should be in near-final form prior to scheduling the oral presentation and FINAL meeting.
 - b. The RESEARCH REPORT must also be submitted to the Program Administrator to check formatting and to the Turnitin Program within this time frame (see [Turnitin Program Scanning of Major Writing Assignments](#) policy on page 9).
 - c. The final version of the RESEARCH REPORT is submitted to the Program Director and the Program Administrator for approval following any corrections required after the FINAL Committee Meeting.
 5. Attend the FINAL GUIDANCE COMMITTEE MEETING. The Guidance Committee will discuss the student's RESEARCH REPORT, notebooks, and oral presentation to determine whether or not the student has met all the requirements for the M.S. degree. The Guidance Committee will then make their recommendations on the "RESULT OF M.S. REQUIREMENT" form.

STUDENT OBLIGATIONS FOR COMMITTEE MEETINGS

The student shall:

1. Be responsible for working with their Guidance Committee to schedule committee meetings in a timely manner.
2. Arrive at their committee meetings well prepared.
3. Record minutes of their meetings, to be approved by the Advisor. These minutes shall be detailed and describe the discussion and decisions made by the committee, and must be signed by both the student and the advisor. The form "RECORD OF GUIDANCE COMMITTEE MEETING" and minutes must be submitted to the Program Office within 2 weeks of the meeting.
4. Provide the Guidance Committee with copies of the "RESEARCH GRADING FORM" at each meeting. Depending on the meeting date, these forms may not be completed, but should still be discussed. It is useful to keep these forms in a folder to have past forms available, should they need to be readdressed.
5. Procure Program Director approval to make changes to their Guidance Committee by submitting the form "REQUEST FOR CHANGE IN GUIDANCE COMMITTEE",
6. For **THESIS OPTION STUDENTS**: Submit the THESIS PROPOSAL to the Guidance Committee as follows:
 - a. The proposal must be provided to the Committee by February 1 of Year 2, and will consist of:
 - i. A complete **one-page Specific Aims section**, including **Rationale, Hypothesis to be tested, Aims**, and a general statement of **Approaches** to be used;
 - ii. An outline of the **Experimental Plan**, including the experiments to be done for each aim and specific techniques to be used in the experiments
 - b. The student will make an **oral slide presentation** of the background, aims and research plan of their project to their committee by February 15 of Year 2.
 - c. The student will submit to the Program Office NO LATER THAN MARCH 1:
 - i. The final approved Proposal outline, as described above;
 - ii. The completed "RESULT OF M.S. REQUIREMENT" signed by all committee members.
 - iii. It is highly recommended that the student complete the requirement well ahead of the March 1 deadline.
 - d. The student's proposal and oral presentation must both be acceptable to meet this requirement. The thesis research must be original and creative, and demonstrate an understanding of the scientific method. Before completing the Program, the

student must register for at least 3 credits of Thesis, **BP799**.

7. For **NON-THESIS OPTION STUDENTS**: Submit the RESEARCH REPORT to the Guidance Committee as follows:
 - a. The RESEARCH REPORT must be submitted to the Committee 3 weeks prior to the scheduled oral presentation and final committee meeting.
 - b. The RESEARCH REPORT should be formatted in a manner similar to that for the THESIS (i.e., a “data chapter”).
 - c. The RESEARCH REPORT should include an appropriate **Introduction, Hypothesis, Rationale**, detailed **Methods** used, and a detailed description of the **Results**. The paper should be summarized in an appropriate **Discussion/Conclusion** section. This report may be formatted as an ORIGINAL ARTICLE for a relevant journal in the student’s field of research.
 - d. References should be formatted according to the guidelines for the THESIS, and include all authors’ names, full journal name, volume, and inclusive page numbers.
8. Prior to the FINAL committee meeting in EITHER option, the student will give an open chalk talk/formal oral presentation within their department.
 - a. This should be scheduled such that all members of the Guidance Committee are able to attend.
 - b. The presentation should be professional in nature.
 - c. The presentation shall be followed by the FINAL committee meeting. For THESIS OPTION students, this constitutes the THESIS DEFENSE. Generally, these should all occur on the same day, as is traditional for a PhD Dissertation Defense.
 - d. The student will have all members of the Guidance Committee sign the “RESULT OF M.S. REQUIREMENT” form, and submit to the Program Office.
 - e. **THESIS OPTION** students will also:
 - i. Complete and submit the “THESIS ACCEPTANCE AND PROCESSING” form. Submit the thesis to the Biomedical Sciences Program office for formatting review, preferably before the defense.
 - ii. Submit the final version in PDF form after approval of the format for archiving.
 - iii. Submit the original and at least one copy of the thesis for binding at Long’s-Roulet Book Binders, 2800 Monticello Avenue, in Norfolk, with payment of the necessary fees (about \$75-100). The receipt must be returned to the Program Office before the student can be awarded his or her degree. Bound copies will be distributed to the EVMS library and Research Advisor, as well as the student, if the student chose to have a copy bound for themselves.
9. In the semester that the student defends their THESIS (THESIS OPTION) or finishes their RESEARCH REPORT (NON-THESIS OPTION) :

- a. The student must be registered for a minimum of one credit of Thesis, BP799.
- b. The M.S. degree will be awarded after all requirements are completed.
- c. Students who wish to participate in EVMS graduation ceremonies in May must apply in January.
- d. Students may participate in commencement if they are expected to complete requirements by August. The degree will be awarded after completion of all requirements is certified by the Program Director.

APPENDIX C: THESIS FORMATTING AND SUBMISSION

FORMAT OF THESIS

The thesis will follow the format in the current guide to Theses and Dissertations, which may be obtained from the Program Director or Program Coordinator.

STEPS TO FINALIZING THESIS

1. The THESIS and the Turnitin software report will be submitted to the EVMS Biomedical Sciences office after the committee has approved the thesis. The Program Coordinator will review the Thesis for formatting and the student will be given a list of items that need to be corrected to conform to the formatting standards (see above). After the corrections are made, the document will be approved by the Program Director.
2. The student will submit the original of their Thesis, plus 1-3 copies on bond paper (EVMS watermarked paper is available from the Program Office).
 - a. 1 copy for EVMS Library
 - b. 1 copy for advisor
 - c. 1-2 copies to student (Optional)
3. The student will take the copies to the bindery. The student normally pays the cost of binding, but the advisor may cover this cost. After the fees have been paid, the student will bring the receipt for payment to the Administrator. The student's degree will be then awarded based on the date all requirements were completed.
4. M.S. Theses must also be submitted to the Biomedical Sciences Administrator as **PDF files of the final approved and correctly formatted version**. The PDF file version will be archived in the program office. The document is legally copyrighted without registration.
5. The student must deliver bound copies to the Research Advisor and the Program Coordinator.

APPENDIX D: ADMINISTRATION AND PROGRAM FACULTY

EXECUTIVE COMMITTEE

To assist the Program Director and ensure adequate input by participating faculty members at EVMS, the Program’s Executive Committee sets program policy. The Committee consists of the Program Director, Chair of the Curriculum Committee, and Chair of the Admissions Committee. The Program Director calls meetings as needed, records and distributes minutes and an agenda for each meeting, and will serve as Chair. The Committee will approve and be responsible for Program faculty issues and policies.

PARTICIPATING FACULTY

EVMS Department of Microbiology and Molecular Cell Biology

Ronen Borenstein, PhD	Lewis Hall 3112	Lewis Hall 3175
Richard Ciavarra, PhD	Lewis Hall 3166	Lewis Hall 3161
Dianne Daniel, PhD	Lewis Hall 3152	Lewis Hall 3162
Elena Galkina, PhD	Lewis Hall 3180	Lewis Hall 3143
Julie Kerry, PhD	Lewis Hall 3174	
Aurora Esquela Kerscher, PhD	Lester Hall 421	Lester Hall 460-461
Woong-ki Kim, PhD	Lewis Hall 3047	Lewis Hall 3053
Patric Lundberg, PhD	Lewis Hall 3186	Lewis Hall 3057
David Mu, PhD	Lester Hall 420	Lester Hall 442-445
Julius Nyalwidhe, PhD	Lester Hall 424	Lester Hall 458-459
O. John Semmes, PhD	Lester Hall 426	Lester Hall 462-465
Julia Sharp, PhD	Lewis Hall 3114	Lewis Hall 3115
Amy Tang, PhD	Lester Hall 423	Lester Hall 454-457
David Taylor-Fishwick, PhD	Lewis Hall 2128	Lewis Hall 2151

EVMS Department of Pathology and Anatomy

Gyorgy Lonart, PhD	Lewis Hall 3077	Lewis Hall 3076
Larry Sanford, PhD	Lewis Hall 2051	Lewis Hall 2067
Laurie Wellman, PhD	Lewis Hall 2053	Lewis Hall 2067

EVMS Department of Physiological Science

Frank Castora, PhD	Lewis Hall 3146	Lewis Hall 3139
Anca Dobrian, PhD	Lewis Hall 2027	Lewis Hall 2040
Diane Duffy, PhD	Lewis Hall 2045	Lewis Hall 2037
Eva Forgacs-Lonart, PhD	Lewis Hall 3130	Lewis Hall 3137

Vitold Galkin, PhD
Frank Lattanzio, PhD
Souad Belmadani
Gerald Pepe, PhD
Howard White, PhD

Lewis Hall 3126
Lewis Hall 3025
Lewis Hall 2025
Lewis Hall 2059
Lewis Hall 3132

Lewis Hall 3140
Lewis Hall 3030
Lewis Hall 2032
Jones Institute 346
Lewis Hall 3236

EVMS Department of Obstetrics and Gynecology

Silvina Bocca, M.D., PhD Jones Institute 425, 414

EVMS Department of Radiation Oncology

Richard Britten, PhD Lewis Hall 2170 Lewis Hall 2167

EVMS Department of Psychiatry

Stephen I. Deutsch, M.D., PhD Hofheimer Hall Lewis Hall 3058

Old Dominion University

Roy Ogle, PhD (rogle@odu.edu)
Harold Riethman, PhD (hriethma@odu.edu)
Patrick Sachs, PhD (psachs@odu.edu)

Other

William McPheat, PhD*, MBA (willie.mcpheat@gmail.com)

*Adjunct Faculty

B. BIOTECHNOLOGIES CONCENTRATION

CURRICULUM (SNAPSHOT OF COURSES AND SEQUENCE)

Year 1

All students will take the following courses in Fall and Spring:

FALL SEMESTER

BP 700: Molecules to Cells	2 credits
BP 701: Molecular and Cellular Techniques	2 credits
BP 703: Cell Communication and Signaling	3 credits
BP 704: Molecular Genetics	1.5 credits
BP 710: Oral Communication Forum	1 credit
BP 719: Lab rotation I	2 credits
Total	11.5 credits

SPRING SEMESTER

BP 706: Cell Energetics and Organ Function	3 credits
BP 781: Applied Biostatistics and Bioinformatics	3 credits
BP 710: Oral Communication Forum	1 credit
BT719: Advanced Molecular and Cellular Techniques*	2 credits
BT709: Proteomic Technology*	2 credits
BT707: Microscopy and Imaging Techniques *	2 credits
BT711: Flow cytometry *	2 credits
Total	15 credits

* These courses constitute the “**Biotechnology Bundle**” and **are required** for the Biotechnologies Concentration students; these same courses are offered individually as **electives** for the Translational Sciences Concentration students.

During the Fall and Spring semesters of Year 1, the Program Director will serve as the student’s Advisor.

SUMMER SEMESTER

BT 714: Internship (On or Off Campus)	3 credits
Total	3 credits

Year 2

FALL SEMESTER

BP 771: Methods & Logic in Translational Biology	4 credits
BP773: Responsible Conduct in Science	1 credit
BP 709: Scientific Writing and Research Design	1 credit
BP 710: Oral Communication Forum	1 credit

Total **7 credits**

Year 2

SPRING SEMESTER

BT 716: Internship (Continues)	3 credits
BP 710: Oral Communication Forum	1 credit

TOTAL **4 credits**

At the conclusion of the Spring Semester in Year 2, students will return to campus to make presentations on the techniques they have learned and the results of their Internship projects.

CURRICULUM POLICIES

The Biotechnologies Concentration is designed so that a well-qualified, highly motivated student can complete it in 2 years. **All requirements for the degree must be completed within three calendar years from the date of matriculation.** Exceptions must be approved by the Program Director. Students whose graduate study is interrupted for military service will be granted an extension for the period of their service, not to exceed five years.

Year 1: Basic Biomedical Sciences and Research Techniques

The Program Director will serve as the Student Advisor. During the first year, the student will be required to satisfactorily complete all required courses. In rare circumstances, graduate courses taken at other institutions can be transferred (up to 6 credits maximum) into the curriculum of each student at the discretion of the Program Director. The student must present the syllabus from courses being considered for transfer credit, and their content must be very similar to courses required in the EVMS Program in order to qualify for approval.

In the Spring semester of Year 1, the student must file an Application for Internships. By May 15 of Year 1, each student will be matched with an Internship

and an **Internship Advisor**. If the student is doing an Internship off-campus, the Program Director will serve as the **EVMS Co-Advisor**. Please submit the **Internship Form** to document the Internship assigned and the Internship Advisor.

Summer Year 1 – Spring Year 2: Biotechnology Internship and Advanced Courses

During the Summer Semester of Year 1 and the Spring Semester of Year 2, the student will satisfactorily complete a **Biotechnology Internship** in an approved laboratory or off-campus company or organization, and advanced courses during the Fall Semester of Year 2, as detailed above.

At the conclusion of the second Internship, the student will make an **oral presentation** to classmates and the faculty on the techniques learned and results achieved during the two Internships. Requirements for application to the Internships, expectations, and evaluation procedures will be provided to the student in the Spring semester of Year 1.

Hours During The Internship

The Biotechnology Concentration Internships should be treated as a full time job and students should be highly motivated, without a requirement for a minimum number of hours to be worked. Students in their Internships should work a minimum of 40 hours per week. To make progress in their work, most students will find it necessary to work longer hours, which may include some evening and/or weekend hours.

POLICY FOR STUDENTS WISHING TO LEAVE AN INTERNSHIP

6. A conflict or problem that cannot be resolved between an advisor and a student should be reported to the Program Director (PD) by either party.
7. The PD will meet with the student and advisor to try to resolve the problem.
8. If the problem is not resolved, the student and advisor will be required to meet with the Biomedical Sciences Executive Committee and the PD or other EVMS officials, as appropriate.
9. If, after attempts to resolve the conflict or issue, either the student or the advisor wishes to terminate the mentoring relationship, a written request must be submitted to and approved by the PD. The request should give reason(s) why the mentoring relationship should end.
10. If the student wishes to leave a laboratory, the advisor and the PD must receive written notice of termination of the mentoring relationship. The student will leave the lab at a date mutually agreed on by the student and the advisor, but the maximum time after giving the PD written notice will be 30 days. The student will continue to perform research in the mentor's laboratory until the termination date.

REQUIRED ACTIVITIES FOR BIOTECHNOLOGY MASTER'S STUDENTS

Individual Development Plan (IDP)

Each student must complete an Individual Development Plan in the Spring semester of Year 1. The form will be submitted by the student to the Program Director. The student and Program Director will then meet to review the student's career goals and the progress they are making towards them. The **Application for Internships** will also be reviewed during this time. The final plan will be approved by the Program Director, and copies will be provided to the student and the Biomedical Sciences Program Office. The IDP will be finalized in the Spring semester of Year 2 by the student and the Internship Advisor and submitted to the Program Director and the Biomedical Sciences Program Office.

Documented Seminar Attendance

Students are required to attend and document attendance at five (5) research seminars at EVMS in Year 1. The seminars should be focused on basic science rather than clinical medicine, and given by faculty-level scientists (Ph.D. or M.D.) at EVMS, ODU, and LifeNet Health. Students are required to file a form that will certify that the seminar qualified and that the student attended the seminar.

Attendance at Research Day, Graduate Student Research Conference

Attendance at Research Day (mid-October) and Graduate Student Conference (Spring) is required for students who are on campus, and will be documented with a sign-in sheet. Students must attend the entirety of both events. Students who do not attend will be put on academic warning. Extenuating circumstances must be approved by the Program Director. Students will be required to provide documentation of said absence.

Course Evaluations

Students are REQUIRED to submit course evaluations for all courses taken. Students who do not submit course evaluations within **5 days** of the end of a semester will be placed on [academic warning](#), and if the evaluations are not submitted 4 weeks after the end of a semester, they will be placed on [academic probation](#). These actions will become part of the student's permanent academic record. Continued failure to submit course evaluations by the deadline for an additional 2 semesters may result in further disciplinary action, up to and including dismissal from the program.

Appendices for Biomedical Research Masters' Students

Concentration in Biotechnologies

APPENDIX A: BIOTECHNOLOGY CONCENTRATION: STUDENT CHECKLIST

FALL SEMESTER – YEAR 1

- Download the EVMS Biotechnology Master's Program Handbook.
- If necessary, meet with the Program Director to determine if any required courses can be waived because of prior equivalent graduate coursework.
- Register for Spring semester classes ***by ~November 10.***
- Submit Course Evaluations ***by ~December 15***

SPRING SEMESTER – YEAR 1

- Meet with Program Director to discuss Individual Development Plan and selection of an Internship.
- Apply for Internships as prescribed by the Program Director.
- Register for Summer semester classes ***by ~April 10.***
- Be matched with an Internship and select an Internship Advisor (and EVMS Co-Advisor if working off-campus) by **May 15.**
- Submit Course Evaluations ***by ~June 1***

SUMMER SEMESTER – YEAR 1

- Start Internship Full Time.
- Register for Fall semester classes ***by ~July 10.***

FALL AND SPRING SEMESTER – YEAR 2

- Complete Advanced Fall courses**
- January:** start (or continue) second Internship
- Application for Graduation – January prior to May graduation. To participate in ceremony, student must be expected to complete requirements by August 15
- Refine Individual Development Plan with Internship Advisor.
- Apply for Employment early!
- Oral Presentation of Internship Expertise and Results at EVMS (***April***)
- Submit Course Evaluations ***by ~May 1st***
- Exit Interview with Program Director (**Required**)

APPENDIX B: RESPONSIBILITIES OF THE STUDENT'S ADVISOR DURING THE INTERNSHIP

A. Insure that the student continues to make progress on the internship project.

A student whose work progress is found to be unsatisfactory by the Internship Advisor (and EVMS Co-Advisor, if Internship is off-campus) shall be placed on academic probation. The student will then be given a minimum of one month and a maximum of two months to address the concerns specified by the Internship Advisor (and Co-Advisor). At the end of the probationary period, the Internship Advisor (and Co-Advisor) will meet again with the student to determine if the student's progress is satisfactory. If it remains unsatisfactory, the Internship Advisor will report this to the Program Director. The student will be dismissed from the program unless the student successfully appeals the decision to the Program Director.

B. Counsel and aid the student during the Internship.

The Internship Advisor will guide the student during the internship phase to complete their project and to train the student in the use of equipment and techniques. However, the work is to be the student's own and the internship is designed to give the student maximum opportunity for hands-on training.

C. Counsel the student in preparation for the Final Oral Presentation.

The Internship Advisor will guide the student in the preparation of an oral presentation describing his or her Internship work. The Master's degree will be awarded after completion of all requirements and approval by the Program Director.

D. Approval of the Final Oral Presentation.

The student's oral presentation must be approved by his or her Internship Advisor (and EVMS Co-Advisor, if the work was done off-campus), and the Program Director. The Oral Presentation Form must be completed and signed by them.

E. Reports and Student Progress.

The Internship Advisor should report the student's progress during the Internship to the Program Manager by email on a quarterly basis (August 15 and April 1) by completing the INTERNSHIP EVALUATION FORM. A letter grade will be submitted by the Internship Advisor that reflects the student's progress and performance throughout the Internship period.

APPENDIX C: ADMINISTRATION AND PROGRAM FACULTY

EXECUTIVE COMMITTEE

To assist the Program Director and ensure adequate input by participating faculty members at EVMS, the Program's Executive Committee sets program policy. The Committee consists of the Program Director, Chair of the Curriculum Committee, and Chair of the Admissions Committee. The Program Director calls meetings as needed, records and distributes minutes and an agenda for each meeting, and will serve as Chair. The Committee will approve and be responsible for Program faculty issues and policies.

PARTICIPATING FACULTY

EVMS Department of Microbiology and Molecular Cell Biology

Elena Galkina, PhD	Lewis Hall 3180	Lewis Hall 3143
Julie Kerry, PhD	Lewis Hall 3174	
Aurora Esquela Kerscher, PhD	Lester Hall 421	Lester Hall 460-461
Woong-ki Kim, PhD	Lewis Hall 3047	Lewis Hall 3053
David Mu, PhD	Lester Hall 420	Lester Hall 442-445
Julius Nyalwidhe, PhD	Lester Hall 424	Lester Hall 458-459
O. John Semmes, PhD	Lester Hall 426	Lester Hall 462-465
Julia Sharp, PhD	Lewis Hall 3114	Lewis Hall 3115
Amy Tang, PhD	Lester Hall 423	Lester Hall 454-457
David Taylor-Fishwick, PhD	Lewis Hall 2128	Lewis Hall 2151

EVMS Department of Pathology and Anatomy

Gyorgy Lonart, PhD	Lewis Hall 3077	Lewis Hall 3076
Larry Sanford, PhD	Lewis Hall 2051	Lewis Hall 2067
Laurie Wellman, PhD	Lewis Hall 2053	Lewis Hall 2067

EVMS Department of Physiological Science

Frank Castora, PhD	Lewis Hall 3146	Lewis Hall 3139
Anca Dobrian, PhD	Lewis Hall 2027	Lewis Hall 2040
Diane Duffy, PhD	Lewis Hall 2045	Lewis Hall 2037
Eva Forgacs-Lonart, PhD	Lewis Hall 3130	Lewis Hall 3137

Vitold Galkin, PhD
Frank Lattanzio, PhD
Souad Belmadani
Gerald Pepe, PhD
Howard White, PhD

Lewis Hall 3126
Lewis Hall 3025
Lewis Hall 2025
Lewis Hall 2059
Lewis Hall 3132

Lewis Hall 3140
Lewis Hall 3030
Lewis Hall 2032
Jones Institute 346
Lewis Hall 3236

EVMS Department of Radiation Oncology

Richard Britten, PhD

Lewis Hall 2170

Lewis Hall 2167

EVMS Department of Psychiatry

Stephen I. Deutsch, M.D., PhD

Hofheimer Hall

Lewis Hall 3058

Other

William McPheat, PhD*, MBA (willie.mcpheat@gmail.com)

*Adjunct Faculty