HANDBOOK

BIOMEDICAL SCIENCES
RESEARCH MASTER'S PROGRAM

EVMS
Eastern Virginia Medical School

August 2009 Edition

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I. THE PROGRAM

The Biomedical Sciences Research Master's Program is a two year course of study offering three options: Thesis, applied biotechnology and non-thesis. After the first year core curriculum, students pursuing the thesis option focus on laboratory research. Students in the applied biotechnology option acquire additional technical skills appropriate for positions in the biotechnology or pharmaceutical industries. This includes hands-on instruction in molecular cloning, PCR, real-time PCR, DNA sequencing, mutagenesis, gene manipulation, DNA microarrays, proteomics and bioinformatics. In the non-thesis option, students complete additional advanced coursework based on their interests and goals. All of the hands-on technical courses are available as electives for any of our Biomedical Science programs.

In the past 30 years, employment opportunities in biotechnology and pharmaceutical sciences have rapidly expanded. This program is designed to train students for the demands of research in a high-tech world. Our highly trained faculty creates a cutting-edge learning environment for prospective researchers that will prepare them for rewarding careers basic science and translational research.

II. THE CURRICULUM

The Biomedical Sciences Masters-Research Track Program provides students with a multidisciplinary foundation. A hands-on approach to learning is offered by EVMS basic research scientists in areas such as cell and molecular biology, endocrinology, human physiology, medical microbiology, neuroscience, pharmacology, and reproductive biology. Students initially complete a one-year core curriculum, providing a foundation in molecular and cell biology, biochemistry, physiology and research techniques. The curriculum for the second year is individually developed for each student to encompass the student's specific areas of interest.

The detailed curriculum below lists requirement for the three different Options. Please also refer to the comparison chart in Appendix B (page 13) for the sequence of courses in each Option. In general, full-time registration (9 or more credits, Fall and Spring) is expected of all students. Students must petition and receive approval from the Director in advance for permission to register for more than 14 credits in Fall or Spring semester.

Year 1: **All students will take the following courses in Fall and Spring:**

Course #	Course Name	Credits
Fall		
BP 702	Medical Molecular and Cell Biology	3
BP 748	Advanced Cell Biology	1
BP 773	Responsible Conduct in Science	1
BP 741	Introduction to Research Literature	1
BP 718	Introduction to the Laboratory	2
BP 717	Research Techniques	2
BP 719	Biomedical Sciences Lab Rotation I (Oct-Dec)	2
TOTAL		12 credits

Spring

BP 703	Medical Biochemistry	4
BP 761	Essentials of Physiology	3
BP 732	Biomedical Sciences Seminar	1
BP 720	Lab rotation II (Jan-Mar)	2
BP721	Lab Rotation III (Optional; March-May)	2
Total		10-12 credits

Summer

BP 798	Research (Thesis Option)	2
or BP729	Applied Biotechnology Internship (Biotech)	2
or BP721	Lab Rotation III (if research lab not identified)	2
BT 507A	Bioinformatics (all students)	1
Total		3 credits

All students will complete two or three eight-week laboratory rotations (in two different laboratories) during Fall and Spring of Year 1 (and Summer if necessary). Each laboratory rotation will consist of a minimum of 120 hours of laboratory work **(15 hours per week)**. **Research credits are optional for Non-thesis students in the Summer of Year 1.**

By July 1 of Year 1, each student in the **Thesis or Biotechnology Option** will select an **Advisor**, and with the help of the Advisor, will select a **Thesis or Guidance Committee**, chaired by the Advisor. The Committee will help the student select Advanced Courses for the second, and any subsequent, year(s) and will guide the student in research or in a biotechnology project. Please submit the **appropriate forms** to set up these Committees. All Master's students should submit the **Curriculum Sheet** (Appendix F).

For students in the Non-Thesis Option, the Initial Guidance Committee will continue to monitor the student's academic progress at least once a year to and approve changes in the curricular plan.

Year 2:
(See the comparison chart on page 13 for a typical curriculum for each option)

Thesis Option:

Required Courses

Course#	**Course Name**	**Credits**
MPH 602	Biostatistics (Spring)	3
BP 732	Biomedical Sciences Seminar /Fall	1
BP 732	Biomedical Sciences Seminar /Spring	1
BP734	Concepts in Research Design (Fall)	3

Students in **Thesis Option** must complete a minimum of **3 additional credits of Advanced Coursework chosen from the list below**, and a minimum of **10 credits of Research** (including

credits from Lab Rotation III [BP721], if taken in the thesis laboratory, and Thesis [BP799]), and are expected to complete and defend their Theses by the end of Year 2 of the Program.

Non-Thesis Option:

Required Courses

Course#	Course Name	Credits
MPH 602	Biostatistics (Spring)	3
BP 732	Biomedical Sciences Seminar /Fall	1
BP 732	Biomedical Sciences Seminar /Spring	1

Students in the **Non-Thesis Option** must complete a minimum of **10 credits of Advanced Courses**, which are chosen in consultation with the Initial Guidance Committee. The list below includes courses that qualify. Students in the **Non-thesis Option** will be required to successfully pass a **Comprehensive Exam** at the end of Year 2 as directed by the Curriculum Committee, after completion of the Advanced Course requirements. The Exam format will cover the content of Year 1-2 courses, knowledge gained during lab rotations and the student's ability to read, understand, and analyze the relevant research literature.

Applied Biotechnology Option:

Required Courses

BP762	Advanced Molecular and Cellular Techniques	3	(Summer after Yr 1)
BP727	Genomics/Microarray Technology	1	(Spring, Year 2)
BP728	Proteomic Technology	1	(Spring, Year 2)
BP729	Applied Biotechnology Internship	**10**	(over 2 semesters)

Students in the **Applied Biotechnology Option** may take other advanced courses from the list below if they wish. Students in the **Applied Biotechnology Option** will complete a **Laboratory Report**, which will be submitted for approval to the student's Guidance Committee at the end of Spring Semester, Year 2.

Advanced Courses

Medical School Courses:

BP715	Human Physiology I (Fall)	2
BP716	Human Physiology II (Spring)	3
(OR BP807	Human Physiology (Fall to Spring)	5)
BP809	Medical Microbiology-Bacteriology	2
BP810	Medical Microbiology-Virology	2
BP812	Medical Microbiology-Immunology	2
BP801	Medical Gross Anatomy	6
BP706	Pharmacology (Fall to Spring)	5
BP765	Neuropharmacology	3
BP708	Medical Neuroscience	5
BP726	Medical Histology	5

Biomedical Sciences Graduate Courses:

BP762	Advanced Molecular and Cellular Techniques (Summer)	3
BP734	Concepts in Research Design* (Fall)	3
BP735	Advanced Proteomics	2
BP747	Mammalian Reproduction	3
BP749	Molecular & Cellular Immunology (Spring)	2
BP752	Animal Virology (Spring)	3
BP754	Tumor Biology (Spring)	3
BP758	Cardiovascular and Metabolic Function and Dysfunction	3
BP871	Advanced Endocrinology (Fall)	3
BP776	The Mammalian Ovary	3
BP895	Special Topics	Varies

Policies and Description of the Curriculum

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

1. Year I (Basic Biomedical Sciences and Research Skills)

The Program Coordinator and an Initial Guidance Committee of faculty will advise each student. The Initial Guidance Committee (Appendix C) will be appointed by the Program Director and will counsel students about required and elective courses. During the first year, the student will be required to satisfactorily complete (a) all of the required courses, including (b) two laboratory rotations.

a. Basic Biomedical Sciences Courses

The basic biomedical science coursework provides an interdisciplinary background for advanced coursework and/or research.

b. Research Laboratory Rotations

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

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

2) Each laboratory rotation will be for an 8 week period and requires at least 120 hours of lab time (**15 hours/week**).

3) The rotations must be completed by the beginning of the second year.

4) A graduate laboratory course or other research experience may, with the approval of the Guidance Committee, substitute for one rotation.

c. Seminar Program

During the first year, students are required to participate in a seminar ("journal club") course. The seminar will include presentations, evaluations and discussions of current journal articles in various biomedical sciences. Each student presents a paper once a semester.

2. Year 2 (Specialization)

During Year 2, the student will satisfactorily complete **advanced courses** approved by the Guidance Committee and/or Thesis Committee, as detailed above. 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 student's Committee.

In the **Thesis Option**, the student forms a **Thesis Committee**, prepares and presents a written **Research Proposal** by **February of Spring Semester, Year 2**. Detailed requirements for the proposal and policies governing the **Thesis Committee** are found in **Appendix C**.

After the thesis research is completed, the student will **write a thesis and defend it** in two forums - an open seminar and in an oral thesis defense administered by the Thesis Committee. Guidelines for the format of the thesis can be obtained from the Biomedical Sciences Program Office. Detailed requirements for the thesis, its defense and approval are found in **Appendix C**.

III. FINANCIAL AID

Sources of financial aid are available to Biomedical Sciences Research Masters Program students from the Financial Aid Office at Eastern Virginia Medical School.

Financial aid officers at Eastern Virginia Medical School process various Federal and State student loan applications. Current information and applications should be sought from the Office of Financial Aid. Loans are given only to students who meet the criteria established by the Office of Financial Aid and who remain in good academic standing.

IV. PROGRAM POLICIES

Please refer to the Health Professions policy section of the EVMS Student Handbook (currently pages 38-42; 2009 edition) for detailed policies that apply to all Health Professions students, including those in the Biomedical Sciences.

A. THE HONOR SYSTEM

The Honor System at Eastern Virginia Medical School 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 of 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 option of proctoring all types of examinations or arranging for others, including students, to proctor such examinations.

B. GRADING POLICY

Grades are assigned according to the following letter system:

GRADE	QUALITY POINTS	COMMENT
A	4.00	Excellent
A-	3.67	
B+	3.33	
B	3.00	Good
B-	2.67	
C+	2.33	
C	2.00	Poor
C-	1.67	
D+	1.33	
D	1.00	Unsatisfactory
D-	.67	
F	0.00	Fail
P	0	*See below
F (P/F)	0	*See below
I	0	Incomplete
II	0	Incomplete w/o expiration
W	0	Official withdrawal

*Course directors may propose, through the Curriculum Committee, graduate courses for Pass/Fail designation. Such courses are subject to approval by the Program Director. A graduate student may earn pass/fail credit only in those courses so designated.

A grade of "I" indicates assigned work yet to be completed in a given course and is assigned only upon instructor approval. A written agreement is prepared and signed by the instructor and the student specifying the work remaining to be completed and the time frame for doing so. The work must be completed by **the midpoint of the following semester**. Extensions require written approval of both the instructor and the Program Director. Unless an extension has been approved, an “I” grade will be converted to either an “F” or the grade 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. Research and Applied Biotechnology Internship credit should be graded each term, rather than assigning an "I" until completion of all research applying toward the M.S. degree.

MINIMUM ACADEMIC STANDARDS

The graduate student's record is reviewed by the Program Director at the end of every semester. To remain in good academic standing, the student must:

1. Have a cumulative GPA of 3.0 or greater on a four point scale.

2. Pass all required courses and meet other requirements within the time frames specified above.

3. Students in the Thesis or Biotechnology Options must identify an **Advisor** for the thesis research or biotechnology internship **before Fall semester of the second year**. The Program Director, Program Coordinator, and faculty will help the student identify an appropriate laboratory.

<u>ACADEMIC PROBATION</u>: The following regulations govern probation, dismissal and reinstatement in the program:

1. If the cumulative GPA falls below 3.0, the student will be placed on probation. Probation serves as a warning that grades must improve 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 3.00 after two semesters of probation will result in dismissal from the program. Students dismissed from the program are not authorized 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

5. 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, upon recommendation by the Program Coordinator, 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 upon request from the Biomedical Sciences Program office.*

6. 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. Please refer to the EVMS Student Handbook (pp. 66-67) for appeals/grievance procedures.

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.

Reinstatement is generally not allowed, but special cases may be considered after written appeal by a dismissed student to the Vice Provost for Planning and Health Professions, who will confer with the Executive Committee. 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.

Course Withdrawal Procedures

1. The deadline for withdrawal from courses will be the mid-point of the semester.

2. The student will fill out the Biomedical Sciences Course Withdrawal Form (Appendix F), 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) requires submission of a Student Status change form (on EVMS website: http://www.evms.edu/students/forms/student-status-change.pdf). Students receiving financial aid must confer with the Office of Financial Aid if their student status changes.

Program Residency

All students must spend at least one Academic Year of residency at EVMS, during which they must be enrolled full time.

Outside Employment

Research Master's students are discouraged from taking 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 discuss this with his/her Advisor and the Program Director**.

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 either acquire individual insurance or sign up for the EVMS student health insurance policy. Those with individual or other group policies must obtain a waiver from the EVMS policy by filling out a form online by the appropriate deadline and presenting their health insurance card to the Office of Student Affairs.

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, Radiation Safety, Chemical Hygeine, Biosafety, and Animal Research (LATA basic and mouse modules). Information on training courses required of students will be given during orientation for new students and may also be obtained from the Office of Research.

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, 446-8480.

EVMS Patent Policy

Students participating in research at EVMS should be familiar with the EVMS Patent Policy. Copies are available from the Office of Technology Transfer, 446-7112.

APPENDIX A:

BIOMEDICAL SCIENCES RESEARCH MASTER'S DEGREE PROGRAM: STUDENT CHECKLIST

FALL SEMESTER – Year 1

- ☐ Download the Biomedical Sciences Research Masters Program Handbook and EVMS Student Handbook from the EVMS web site
- ☐ If necessary, meet with the Initial Guidance Committee to determine if any required courses can be waived because of prior equivalent coursework
- ☐ Register for courses as necessary
- ☐ Set up laboratory rotations in advance

SPRING SEMESTER – Year 1

- ☐ Meet with Initial Guidance Committee to discuss lab rotations and selection of Option.
- ☐ Continue Courses and complete two Laboratory Rotations

SUMMER SEMESTER – Year 1

- ☐ Choose faculty Advisor (Thesis and Biotechnology Options)
- ☐ Form Thesis or Guidance Committee (Thesis or Biotechnology Options) and seek guidance on Year 2 Advanced Courses; submit Thesis Committee or Biotechnology Guidance Committee form and Curriculum Sheet approved by the Committee
- ☐ Take required and optional summer biotechniques courses.
- ☐ Non-Thesis Option students meet with Initial Guidance Committee to plan Year 2 curriculum of Advanced Course; submit Curriculum Sheet approved by Committee

FALL AND SPRING SEMESTER – Year 2

- ☐ Take Advanced Coursework as advised by the Guidance or Thesis Committee
- ☐ Research proposal should be completed by February of Spring Semester, Year 2 if Thesis Option is chosen
- ☐ For Non-thesis option, complete Comprehensive Exam by end of Spring Semester
- ☐ Complete Applied Biotechnology project if Biotechnology Option chosen

SUMMER SEMESTER – Year 2 – TO END OF PROGRAM

- ☐ Complete research and thesis (Thesis Option) chosen. Refer to, "Guide for Preparation of Theses and Dissertation" available from Administrator, Biomedical Sciences Programs, or http://sci.odu.edu/sci/about/information/thesis/thesis.pdf
- ☐ Application for Graduation – by January 1 prior to May graduation, if desired
- ☐ Set up Thesis Defense and inform Program Administrator 3 weeks in advance
- ☐ Thesis Defense; Give signed form to Program Director
- ☐ Final copy of thesis approved by Program Director and Administrator, the original and four copies submitted to the Program Office for binding. Submit Thesis Approval form
- ☐ Certification for graduation by Program Director
- ☐ Distribution of final bound copies by Program Administrator

APPENDIX B: Research Master's Program Curriculum Comparison Chart (2009)

	Master's – Thesis Option	Masters – Non-Thesis option	Master's Applied Biotechnology Option
Fall Year 1	Medical Molecular and Cellular Biology (3) BP702 Advanced Cell Biology (1) BP 748 Research techniques (2) BP717 Intro to the Laboratory (2) BP 718 Intro to Research Literature (1) BP 741 Lab rotation I (2) BP719 Research ethics (1) BP773 12 credits	Medical Molecular and Cellular Biology (3) BP702 Advanced Cell Biology (1) BP748 Research techniques (2) BP717 Intro to the Laboratory (2) BP 718 Intro to research Literature (1) BP 741 Lab rotation I (2) BP719 Research ethics (1) BP773 12 credits	Medical Molecular and Cellular Biology (3) BP702 Advanced Cell Biology (1) BP748 Research techniques (2) BP717 Intro to the Laboratory (2) BP 718 Intro to research Literature (1) BP 741 Lab rotation I (2) BP719 Research ethics (1) BP773 12 credits
Spring Year 1	Medical Biochemistry (4) BP703 Essentials of Physiology (3) BP761 Lab rotation II (2) BP 720 Lab Rotation III (2, opt.) BP721 Biomedical Sciences Seminar (1) BP732 10-12 credits	Medical Biochemistry (4) BP703 Essentials of Physiology (3) BP761 Lab rotation II (2) BP 720 Lab Rotation III (2, opt.) BP721 Biomedical Sciences Seminar (1) BP732 10-12 credits	Medical Biochemistry (4) BP703 Essentials of Physiol. (3) BP761 Lab rotation II (2) BP 720 Lab Rotation III (2, opt.) BP721 Biomedical Sciences Seminar (1) BP732 10- 12 credits
Summer Year 1	Bioinformatics (1) BP722 Research (2) BP 898 Or: Lab Rotation III (2) BP 721 3 credits	Bioinformatics (1) BP722 **Research (2) BP798 (OPTIONAL)** **Or: Lab Rotation III (2) BP721 (OPTIONAL)** 1-3 credits	Bioinformatics (1) BP 722 Advanced Molecular and Cellular Techniques (3) BP 762 4 credits
Fall Year 2	Biomedical Sciences Seminar (1) BP732 Advanced electives (3-6) Research (4-6) BP798 7-10 credits	Biomedical Sciences Seminar (1) BP732 Advanced electives (6-8) 7-10 credits	Biomedical Sciences Seminar (1) BP732 Applied biotechnology internship (8) (BP 729) 9 credits
Spring Year 2	Biostatistics (3) MPH 602 Biomed Sci seminar (1) BP732 Advanced electives (3-6) Thesis (3-6) BP 799 10-13 credits; **Thesis and Defense**	Biostatistics (3) MPH 602 Biomedical Sciences seminar (1) BP732 Advanced electives (2-6) 6-10 credits **Comprehensive Examination**	Biostatistics (3) MPH 602 Biomedical Sciences seminar (1) BP732 Genomics (1) BP 727 Proteomics (1) BP 728 Applied biotechnology internship (3) (BP 729) 9 credits; **Laboratory Report**

APPENDIX C: The Initial Guidance Committee and the Thesis Committee

THE INITIAL GUIDANCE COMMITTEE:

The Program Coordinator will serve as the Advisor for first year students.

I. Initial Guidance Committee Guidelines

The Initial Guidance Committee will consist of the Program Director, Program Coordinator and Chair of the Curriculum Committee, or other faculty members appointed by the Program Director. The Guidance Committee will counsel the student about required and elective coursework and choosing an Advisor for thesis research or biotechnology internship. The Guidance Committee will meet in the Spring Semester of the first year to advise students on choice of Option, lab rotations and choosing an advisor. Non-Thesis Students will meet with the Committee in the Summer Semester to select second year coursework. The Guidance Committee will also meet before the school year begins to consider waivers of first-year core courses for new students with previous graduate coursework at other institutions and exemptions from laboratory rotations for those with prior research experience.

The roles of the Initial Guidance Committee include the following:

A. Determine the student's academic background.

The Program Coordinator will meet with the student to review the student's previous training and identify any previous courses that may be substituted for required courses. The Program Coordinator will present recommendations to the Initial Guidance Committee at a meeting prior to the beginning of Fall semester.

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

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

C. Develop a curricular plan to satisfy the student's goals and objectives while meeting all the program requirements.

In the Spring Semester of Year 1, the Guidance Committee will meet with the student and develop a curriculum to meet the student's objectives and satisfy the program requirements. The Guidance Committee will also assist the student in selecting the appropriate option (Thesis, Non-Thesis or applied biotechnology) and research advisor. The curricular plan should be documented in the minutes of the Guidance Committee meeting.

D. Counsel the student and monitor his/her progress toward coursework completion.

For students in the Non-Thesis Option, the Initial Guidance Committee will continue to monitor the student's academic progress at least once a year to and approve changes in the curricular plan. Any changes should be documented with copies to the student, committee members and Program Director.

E. For students in the Thesis Option, counsel the student in the early phases of research. The program encourages students to begin exploring their research interests at the earliest opportunity to facilitate selection of a research mentor and thesis project. This can be done using the Laboratory Rotations and other research opportunities. The student should utilize the Initial Guidance Committee for counsel on research activities prior to choosing an advisor.

II. Thesis Committee

This Committee is to be set up for each student in the Thesis Option in the Summer of Year 1, following selection of a research Advisor. The form "M.S. Thesis Committee" is to be signed by the committee members and submitted to the Program Director. The Thesis Committee will 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. The Thesis Committee's primary role is counseling of the student during the research and thesis phase. The committee will:

A. Determine the student's research interest.

The student and the Chair of the Thesis Committee (research Advisor) will identify a feasible project in an area of mutual interest. It is recommended that a project description be presented orally to the other members of the Thesis Committee for their comment, modification and approval in the Fall semester of Year 2.

B. Counsel the student in the preparation of the Thesis Research Proposal.

The Thesis Committee will guide the student by constructive review in developing a detailed **thesis research proposal**. After its presentation, revision and approval, members of the Thesis Committee will sign the form "Result of M.S. Requirement (Proposal or Thesis Defense)", which must then be approved by the Program Director. The proposal must be in the NIH predoctoral fellowship application format (see http://www.nih.gov.) The Research Plan section should focus on important questions and describe an experimental plan and methods to test the proposed hypothesis. After submitting the written proposal to the Thesis Committee, the student will present the background and the proposal orally to the Committee and answer questions. The Committee may require revisions to the document. 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 3 credits of Thesis, BP799.

C. Insure that the student continues to make progress on the thesis project.

A student whose research progress is found to be unsatisfactory by a majority of the committee shall be placed on academic probation. 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. 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

By submitting the form “Request for Change in M.S. Thesis Committee”, the student may make changes in the composition of the Thesis Committee. Approval of the Program Director is required.

D. Counsel and aid the student during the thesis research phase.

The Thesis Committee will guide the student during the thesis research phase, responding to problems and giving the student aid in use of equipment and supplies. However, the work is to be the student's own and the research must be on an original and significant problem. The Thesis Committee will meet with the student at least once in the second year to review the student's progress and respond to problems or questions the student might have. **Minutes of these meetings will be prepared by the student and distributed to the Advisor, Committee members and Program Director.**

E. Counsel the student during the thesis presentation phase.

The Thesis Committee will guide the student in the writing and oral presentation of the thesis. The student should become familiar with the current **guidelines for writing theses and dissertations**, which are currently available on the ODU College of Sciences website and entitled, "Guide for Preparation of Theses and Dissertations". The format is likely to be changed in the near future and the Program Director will inform students and faculty of any changes. Although the writing is to be reviewed and criticized by the Advisor and the Thesis Committee, the writing must be the student's own. After the thesis research is completed, the student will write a thesis and defend it in two forums - an open seminar and in an oral **thesis defense** administered by the Thesis Committee. A final draft of the thesis is then submitted to the Program Director and the Biomedical Sciences Program Office for approval. After approval, one original and 4 copies of the thesis, printed on bond paper, should be submitted for binding to the Biomedical Sciences Program Office. In the semester that the student plans and defend his/her thesis and to graduate, the student must be registered for a minimum of one credit of Thesis, BP799. The M.S. degree will be awarded in May and December.

Students who wish to participate in EVMS graduation ceremonies in May must apply by January 1. The degree will be awarded after completion of all requirements and certification by the Program Director.

F. Develop and administer the thesis defense.

The Thesis Committee will administer the thesis defense. The aim of the defense is to explore with the candidate the methodological and substantive contributions of the thesis. The thesis should be in near-final form prior to scheduling the oral defense. The time, date and place of the thesis defense will be provided to the Program Administrator and Director by the student at least three weeks in advance. The Program Administrator 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 twenty people to attend. A complete, near-final copy of the thesis should be made available to the Committee at least three weeks prior to the defense.

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.

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.

G. Approval of the Thesis

Following approval by the committee, the final copy of the thesis must be submitted to and approved by the Program Director, along with the signed form, “Thesis Acceptance and Processing”. The thesis is then submitted to the Biomedical Sciences Program office for formatting review. After approval of the format, the original and four copies of the thesis are given to the office for binding, with payment of the necessary fees (about $60-80). Bound copies will be distributed to the student, advisor, and EVMS Library.

III. Applied Biotechnology Option: Guidance Committee

Students choosing the Applied Biotechnology Option will set up a Guidance Committee in the summer of Year 1 with the advice of their Advisors (please submit Applied Biotechnology

Option Guidance Committee Form, Appendix F). This committee will function to advise the student on research and advanced courses (please submit Curriculum Sheet; Appendix F) and will review and approve the student's Laboratory Report at the end of the Spring Semester of Year 2.

Reports and Student Progress

The Guidance or Thesis Committee should meet with the student at least once a year to review the student's progress. For each meeting of the Thesis Committee, the student will prepare a written progress report and distribute it to each member of the committee at least one week prior to the meeting. At each meeting, the student will make an oral presentation of progress and discuss any significant problems that have arisen, in order to obtain constructive criticism from the committee. At the conclusion of each meeting, the Committee will excuse the student to discuss the acceptability of the student's progress. **The Committee Chair (Advisor) should give a brief written report of the student's progress to the Program Director once a year.** This report will become part of the student's file. Students should also submit a completed copy of the "Record of Thesis Committee Meeting" to the Program Director.

APPENDIX D: ADMINISTRATION AND PROGRAM FACULTY

I. ACADEMIC ADMINISTRATION

A. Program Director

Earl Godfrey, Ph.D. (757) 446-5609
Department of Pathology and Anatomy Email: godfreew@evms.edu

B. Program Coordinator

Julie A. Kerry, Ph.D. (757) 446-5679
Dept. of Microbiology and Molecular Cell Biology Email: kerryja@evms.edu

C. Chair, Admissions Committee

Diane M. Duffy, PhD
Department of Physiological Sciences

D. Chair, Curriculum Committee

Richard P. Ciavarra, PhD
Department of Microbiology and Molecular Cell Biology

E. Program Administrator

Leah Solomon (757) 446-5944
Biomedical Sciences Program Office E-mail: solomolj@evms.edu

C. EXECUTIVE COMMITTEE

To assist the Program Director and insure adequate input by participating faculty members at EVMS, the Program's Executive Committee sets program policy. The Committee will consist of the Program Director, Program Coordinator, Chair of the Curriculum Committee, and Chair of the Admissions Committee. The Program Director calls meetings as needed and 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.

II. FACULTY IN BIOMEDICAL SCIENCES

The faculty of the Biomedical Sciences Program is certified according to criteria including research, teaching performance at the advanced level, efforts to secure funding, and attainment of necessary graduate degrees. Certification will be for a five year term and must be renewed every five years.

The Program Coordinator shall solicit nominations for certification of faculty in the Biomedical Sciences Program. Each faculty member must submit a current and complete Curriculum Vitae, in addition to a short summary of research interests. The Biomedical Sciences faculty will then vote on acceptance of faculty recommended for certification or re-certification.

PARTICIPATING FACULTY:

EVMS Department of Internal Medicine:

Jerry Nadler, M.D.
Margaret Morris, Ph.D.
Yuping Deng, Ph.D.
David Taylor-Fishwick, Ph.D.
Gary Pittenger, Ph.D.
Aaron Vinik, M.D., Ph.D.

EVMS Department of Microbiology and Molecular Cell Biology:

Ann Campbell, Ph.D.
Richard Ciavarra, Ph.D.
Dianne Daniel, Ph.D.
Richard Drake, Ph.D.
Elena Galkina, Ph.D.
Edward Johnson, Ph.D.
Julie Kerry, Ph.D.
Aurora Esquela Kerscher, Ph.D.
Woong-ki Kim, Ph.D.
Neel Krishna, Ph.D.
Patric Lundberg, Ph.D.
Julius Nyalwidhe, Ph.D.
O. John Semmes, Ph.D.

EVMS Department of Pathology and Anatomy:

Earl Godfrey, Ph.D.
Gyorgy Lonart, Ph.D.
Paul Aravich, Ph.D.
Larry Sanford, Ph.D.
David Scott, Ph.D.
Dorothy Spangenberg, Ph.D.

EVMS Department of Pediatrics:

Kenji Cunnion, M.D.
E. Stephen Buescher, Ph.D.
David Matson, M.D., Ph.D.
Michael Stacey, Ph.D.

EVMS Department of Physiological Sciences:

Peter Blackmore, Ph.D.
Frank Castora, Ph.D.
Anca Dobrian, Ph.D.
Diane Duffy, Ph.D.
Frank Lattanzio, Ph.D.
Donald Meyer, Ph.D.

Gerald Pepe, Ph.D.
Russell Prewitt, Ph.D.
Miriam Rosenthal, Ph.D.
Michael Solhaug, M.D.
Howard White, Ph.D.
Patricia Williams, Ph.D.

EVMS Department of Obstetrics and Gynecology:

Silvina Bocca, M.D., Ph.D.
Gustavo Doncel, M.D., Ph.D.
Jacob Mayer, Ph.D.
Mahmood Morshedi, Ph.D.
Sergio Oehninger, M.D.
Robert Williams, Ph.D.
Andrei Zalensky, Ph.D.
Irina Zalenskaya, Ph.D.

EVMS Department of Radiation Oncology

Richard Britten, Ph.D.

EVMS Department of Surgery:

Julia Terzis, M.D., Ph.D.

National Institute of Environmental Health Sciences, NIH
(Research Triangle Park, NC)

Darlene Dixon, PhD

APPENDIX E

ADMISSION REQUIREMENTS and APPLICATION PROCEDURES

Minimum admission requirements to the Biomedical Sciences Research Masters Program are:

1. A bachelor's degree from an accredited college or university with a "B" average.
2. Competitive scores on the Graduate Record Examination (GRE) and TOEFL (international applicants only).
3. Prior courses in biology (one year), mathematics and/or statistics (one year), chemistry including organic chemistry (two years). Additional courses in biology, chemistry, physics and mathematics are recommended.

Technical standards are also required and are found on the program's web pages: (http://www.evms.edu/hlthprof/ms-bio-research/technical_standards.html).

APPLICATION PROCEDURES

The completed application for the Biomedical Sciences Ph.D. Program at EVMS must include:

1. **Transcripts of all college coursework**. Official transcripts must be sent by the registrar at colleges and universities attended. **Please allow 4-6 weeks for transcripts and test scores to reach EVMS.**
2. **Graduate Record Examination test scores**, and **TOEFL scores** for international applicants, sent directly from the Educational Testing Service to the Health Professions Admissions Coordinator at EVMS. Codes for this address are available from the testing service.
3. **Three letters of recommendation**, preferably from faculty at the colleges attended by the applicant who are familiar with their academic and research capabilities. Letters from personal friends and family members will not be considered.
4. A **completed application form**, including **a 500 word statement of personal career goals, research interests and academic objectives.**
5. An **application fee**. Checks should be made payable to Eastern Virginia Medical School.

All application materials should be sent to:

Director of Enrollment for Health Professions
Attn: Biomedical Sciences Research Master's Program
Eastern Virginia Medical School
Lewis Hall, Suite 1100, 700 W. Olney Rd
P.O. Box 1980
Norfolk, VA 23501

All application materials must be received by the application deadline, **March 1** of the year in which the student hopes to enroll. Students are only enrolled beginning in the fall semester (starting in August).

APPENDIX F

BIOMEDICAL SCIENCES RESEARCH MASTER'S PROGRAM FORMS

Biomedical Sciences Research Master's Program

OPTION SELECTION FORM

I, _____,
(Student's Name)

select the _____.
(Option Name from List Below)

OPTIONS:

Thesis Option

Non-Thesis Option

Biotechnology Option

APPROVED BY:

_____ _____
(Student's Signature) *(Date)*

_____ _____
(Initial Guidance Committee Chair's Signature) *(Date)*

_____ _____
(Program Coordinator's Signature) *(Date)*

_____ _____
(Program Director's Signature) *(Date)*

_____ _____
(Vice Provost for Planning and Health Professions) *(Date)*

Revised August 2009

Biomedical Sciences Research Master's Program

THESIS COMMITTEE

1. REQUEST:

A. I hereby request the following Thesis Committee be established for:

_____

(Student's Name)

who is enrolled in the Biomedical Sciences Research Master's Program.

COMMITTEE MEMBERS

NAME *(PRINT)*	**SIGNATURE**
_____	_____
_____	_____
_____	_____
_____	_____
(Committee Chair)	*(Committee Chair)*

_____ *(Date)*

B. I concur with the appointment of the above Committee.

_____ _____

(Signature of Student) (*Date)*

2. APPROVAL:

_____ _____

(Program Director) *(Date)*

_____ _____

(Vice Provost for Planning and Health Professions) *(Date)*

Revised August 2009

Biomedical Sciences Research Master's Program
Applied Biotechnology Option
GUIDANCE COMMITTEE

3. REQUEST:

B. I hereby request the following Guidance Committee be established for:

_____
(Student's Name)

who is enrolled in the Biomedical Sciences Research Master's Program – Applied Biotechnology Option.

COMMITTEE MEMBERS

NAME *(PRINT)*	**SIGNATURE**
_____	_____
_____	_____
_____	_____
_____	_____
(Committee Chair)	*(Committee Chair)*

_____ *(Date)*

B. I concur with the appointment of the above Committee.

_____ _____
(Signature of Student) (*Date)*

4. APPROVAL:

_____ _____
(Program Director) *(Date)*

_____ _____
(Vice Provost for Planning and Health Professions) *(Date)*

Revised August 2009

RECORD OF THESIS COMMITTEE MEETING

This is to certify that on _____, _____,
(Date) *(Student's Name)*

who is enrolled in the Biomedical Sciences Research Master's program, completed the requirement for an annual Dissertation Committee Meeting.

Signatures of Committee Members required.

THESIS COMMITTEE

NAME *(PRINT)*	**SIGNATURE**
_____	_____
_____	_____
_____	_____
_____	_____
_____ *(Committee Chair)*	_____ *(Committee Chair)*

Remarks:

_____

_____

_____

_____

Please attach minutes from the Committee meeting and submit the completed form to the Program Director and the Biomedical Sciences Program office.

Revised August 2009

Biomedical Sciences Research Master's Program

REQUEST FOR PERMISSION TO TAKE THE THESIS DEFENSE

1. **REQUEST**: I request permission to take the Thesis Defense for the

Biomedical Sciences Research Master's Program on _____
(Date)

I certify that I am registered for at least one credit during the semester in which the examination will be given.

_____
(Signature of Student)

_____
(Name Typed or Printed)

2. **APPROVAL**: THESIS COMMITTEE MEMBERS

_____

_____

_____

_____

_____ _____
(Thesis Committee Chair) *(Date)*

_____ _____
(Program Director) *(Date)*

_____ _____
(Vice Provost for Planning and for Health Professions) *(Date)*

Revised 8/2009

Biomedical Sciences Research Master's Program

RESULT OF M.S. REQUIREMENT

(PROPOSAL, THESIS DEFENSE or APPLIED BIOTECHNOLOGY LABORATORY REPORT)

(A separate form shall be submitted for each examination/requirement completed)

This is to certify that on _____,
(Date)

_____,
(Student's Name)

who is enrolled in the Biomedical Sciences Research Master's Program,

_____ the examination checked below:
(Passed/Failed/Completed/Approved)

Signatures of Committee Members required.

Designate one:

_____
Thesis Proposal _____ *(Chairman's Signature)*

_____
Oral Thesis Defense _____ *(Member)*

_____
Applied Biotechnology Lab Report _____ *(Member)*

_____
(Member)

_____
(Member)

Remarks:_____

_____

_____

Title of Thesis or Laboratory Report:

_____

_____

_____ _____
(Program Director) *(Date)*

Revised 8/2009

Biomedical Sciences Research Master's Program
REQUEST FOR CHANGE IN
THESIS or GUIDANCE COMMITTEE

1. REQUEST:

A. I request the following changes in the Thesis or Guidance Committee for:

_____
(Student's Name)
who is enrolled in the Biomedical Sciences Research Master's Program.

CURRENT COMMITTEE	**PROPOSED NEW COMMITTEE**
_____	_____
(Chair)	*(Chair)*
_____	_____
_____	_____
_____	_____
_____	_____

_____ _____
(Signature of Current Committee Chair) *(Date)*

_____ _____
(Signature of Proposed Committee Chair) *(Date)*

B. I concur with the above change(s) in the Committee.

_____ _____
(Signature of Student) *(Date)*

2. APPROVAL:

_____ _____
(Program Director) *(Date)*

_____ _____
(Vice Provost for Planning and Health Professions) *(Date)*

Revised 8/2009

THESIS ACCEPTANCE AND PROCESSING

A. Student's Name _____

This is to certify the above named student has submitted his/her thesis and that it has been accepted by the committee as satisfactory.

THESIS TITLE:

_____

_____

Signature of Committee Members: _____ _____
(*Chair's Signature)* *(Date)*

Committee Members' Signatures: _____

_____

_____

Reviewed and Approved by: _____ _____
(Program Director) *(Date)*

_____ _____
\(Vice Provost for Planning and Health Professions) *(Date)*

When Part A has been completed, forward a copy of the approved thesis to the Biomedical Sciences Program Office for review of formatting. After approval of format, please submit a minimum of **one (1) original and four (4) copies** of the thesis.

B. For Biomedical Sciences Program Office Use Only:

_____ Formatting correct and approved
_____ **One original and 4 copies** of thesis received
_____ Binding and other fees paid
_____ Thesis sent to bindery _____ *(Date)*
_____ Thesis returned from bindery _____ *(Date)*
_____ Thesis distribution _____ *(Date)*

1 copy (plus original) to EVMS Library
2 copies to student
1 copy to the Advisor

Revised 2009

Biomedical Sciences Research Master's Program

CURRICULUM SHEET

Student: _____
(Last) *(First)* *(MI)*

CURRICULUM:

REQUIRED COURSES	CREDITS	ADVANCED COURSES	CREDITS

STATUS: ☐ Thesis ☐ Non-Thesis ☐ Biotechnology

Total Credits _____ (30 Thesis, 30 Non-Thesis)

GUIDANCE OR THESIS COMMITTEE APPROVAL:

_____ _____ _____
Advisor or Chair (Print) (Signature) (*Date)*

_____ _____ _____
Member (Print) (Signature) *(Date)*

_____ _____ _____
Member (Print) (Signature) (*Date)*

_____ _____ _____
Member (Print) (Signature) (Date)

APPROVAL:

_____ _____
(Program Director) (*Date)*

_____ _____
(Assoc. Dean for Health Professions) *(Date)*

Revised 8/2009

EASTERN VIRGINIA MEDICAL SCHOOL
BIOMEDICAL SCIENCES RESEARCH MASTER'S PROGRAM
CERTIFICATION FOR GRADUATION

To be completed by applicant:

Name _____
(Last) *(First)* *(MI)*

Candidates: Do not write beyond this point.

To be completed by the Program Director and submitted to the Office of the Registrar:

Entry Year 20____ Option:
Please check one: ☐ Thesis ☐ Non-Thesis ☐ Biotechnology

Indicate the status of the following:	Pending Completion	Not Completed	Not Applicable
Research Requirements	_____	_____	_____
Thesis/Dissertation	_____	_____	_____
Total credits needed for the degree	_____		

List below all required courses that must be completed prior to graduation:

Subject and Course Number	Course Title	Credits
_____	_____	
_____	_____	
_____	_____	
_____	_____	

Substitutions authorized for required courses (Guidance or Thesis Committee Approval required):

_____ for _____
_____ for _____
_____ for _____

Upon completion of the above, this student will have completed all requirements for the Master's degree including the required courses.

_____
(Program Director) (Date) (Vice Provost for Planning and for Health Professions) (Date)

Revised 8/2009

Biomedical Sciences Research Masters Program
THESIS DELIVERY

_____

(Student's Name)

Allow four to eight weeks for binding.

1. If you will be in the Hampton Roads area, please give your address and telephone number so that you may be informed that your thesis is ready to be picked up.

_____

(Street Address)

_____

(City) *(State)* *(Zip Code)* *(Telephone Number)*

---

2. If you will not be in the Hampton Roads area, please give the address to which your thesis should be sent C.O.D. by insured mail.

_____

(Street Address)

_____

(City) *(State)* *(Zip Code)* *(Telephone Number)*

Submit completed form to the Biomedical Sciences Program Office with original and 4 copies of thesis for binding.

Eastern Virginia Medical School

BIOMEDICAL SCIENCES PROGRAMS COURSE WITHDRAWAL / ADD FORM

Student Name: _____ SSN: _____

Semester: _____ Year: _____

ACTION		COURSE NUMBER	COURSE TITLE	CREDIT HRS	GRADE*	INSTRUCTOR SIGNATURE	DATE
DROP	ADD						

REASON FOR ACTION: _____

_____

_____

_____

Student's Signature: _____ DATE: _____

Advisor's Signature: _____ DATE: _____
(if applicable)

Director's Signature: _____ DATE: _____
(if applicable)

*WP or WF must be entered if action takes place after eighth week of classes