Handbook

for the

Master of Science

in

Health Sciences

West Virginia University

Health Science Center

May, 2016

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I. **GOALS AND OBJECTIVES OF THE PROGRAM**

The M.S. program is a terminal degree program targeting students interested in developing their skills toward a career requiring basic science knowledge. The objectives of this program are to

(1) provide integrative scientific education in the biomedical and public health sciences to graduates from an accredited undergraduate institution
(2) provide the opportunity to explore career options in various health professional disciplines
(3) develop integrative and critical thinking skills to allow application of scientific knowledge to traditionally non-scientific fields
(4) train students in the rudiments of research on a basic science, public health or clinical topic; these include hypothesis testing, data collection, manuscript preparation
(5) enhance competitiveness for admission to a health professional and/or Ph.D. program
(6) enhance skills for job placement including resume and cover letter evaluation, and interviewing preparation

To achieve these objectives, our program proposes two areas of emphasis: (1) advancement of basic science and public health knowledge for career enhancement and (2) partnering basic science with other disciplines. In the first area of emphasis, students will augment their scientific skills with advanced coursework emphasizing critical thinking and application of that knowledge to problems facing human health. This area targets students interested in pursuing professional or advanced academic degrees. In the second area of emphasis, the students can expand their knowledge to allow them to direct a non-scientific career toward one that relies on a scientific skill set. Students in this area of emphasis may be teachers wishing to teach science in secondary schools, individuals interested in eventually achieving other professional degrees such as a J.D. or M.B.A. to pursue patent law or a position in a biotech/pharmaceutical company, or positions as a scientific liaison translating scientific knowledge to the general public in a community organization or a for-profit company, a position sometimes called a knowledge broker.

Proposed coursework is designed to build the foundation knowledge common to first-year curricula in medical and dental schools and biomedical and public health Ph.D. programs. The common core curriculum will include coursework in the basic and public health sciences, biostatistics, epidemiology, and social and behavioral theory. In addition to coursework, students will participate in a series of activities including:

-Preparation of an independent development plan and evaluation/aid in implementation of this plan by a faculty mentoring team
-Training in reading and evaluation of the scientific literature
-Enhancement of career development skills, be it preparation to take entrance exams, preparation of resumes and cover letters, and/or interviewing skills
-Participation in seminars to learn cutting edge advancements in science
-Cross-disciplinary approach to the acquiring and application of scientific knowledge
-Summer skill development sessions allowing students to participate in career development activities and embark on shadowing and community service.

In addition to the information contained in this handbook, the student is urged to also consult the current Graduate School Catalog for additional information regarding the requirements of the Graduate Council at West Virginia University.

II. ADMISSION INTO THE M.S. PROGRAM

Prospective students must have an earned bachelor's degree from an accredited university with an overall GPA of at least 3.0 and should have satisfactorily (grade of "C" or above) completed all recommended prerequisites:

1. Biology or related coursework – 1 year
2. Chemistry – 2 years
3. Physics – 1 year
4. Math through Calculus
5. Coursework in the Social or Behavioral Sciences and English

Depending on the intended area of emphasis, students lacking one of these prerequisites can remediate that work through taking the relevant courses concurrently with the M.S. curriculum or during summer session.

Students can request admission beginning with either the Summer semester or Fall session. Students starting with summer session (May) can complete the degree by the end of the spring semester. Students starting in the Fall semester can complete the degree by the end of summer session.

Applicants must complete the Hobson's online application and submit the following:

1. official transcripts from all undergraduate and graduate institutions attended,
2. official GRE, MCAT, or DAT scores, if test has been taken,
3. TOEFL scores, if applicable
4. personal statement describing the applicant's reasons for pursuing a career in science or the application of science to another career, and describe any relevant clinical, community service or research experience
5. resume
6. three letters of recommendation

Under certain circumstances, the admissions committee may waive the GPA requirement.

Applicants will be evaluated for acceptance into this program by an Admissions Committee composed of the following individuals: Program Director – biomedical scientist, Assistant Vice President for Health Sciences Graduate Education (or appointee), representatives from the Schools of Medicine, Public Health, and Dentistry, and the Director of the Health Careers Opportunity Program. Review of applications will begin on February 1 and proceed until all slots are filled or suitable candidates have been identified.

Applicants may be interviewed by two members of the Admissions Committee.

Note: Students considered for admission must demonstrate the intent, passion, drive, and potential for a career in the health professions, academics, research, or other science related career. A goal is to place all graduates in rewarding career positions, and it is imperative that only students with excellent career prospects are admitted.

III. PROGRAM ACTIVITIES

A. Curriculum

Master's Degree Requirements and Course Credit Limitations

Students in a master's program must complete a minimum of 31 total credits, of which at least 25 credits must be coursework other than research or independent study, etc. credits.

Credit toward a MS graduate degree may be obtained only for courses listed in the graduate catalog and numbered 400–799. No more than forty percent of course credits counted toward any graduate degree may be at the 400-level. No residence credit is allowed for special field assignments or other work taken off the WVU campus without prior approval. Graduate credit is obtained only for courses in which the grade earned is A, B, C, P or S. Courses taken as audits or courses in which the grade earned is D, F, or U may not count toward a graduate degree.

A.1. Core Curriculum

The following courses provide the core knowledge recommended for all students. Students with demonstrated ability in one or more of these courses may substitute an elective with permission from the academic mentor. AGBI410 (Agricultural Biochemistry) can be substituted based on recommendation of the graduate director. Students interested in dental school should take PSIO441 instead of PSIO743.

MS in Health Science Courses	Code	Credits	Summer start	Fall start
Independent Study	BMS 695	2	Summer	-
Special Topics: Professionalism	BMS 793B	2	Summer	-
Fundamentals of Physiology	PSIO 743	5	Fall	Fall
Public Health Epidemiology	EPID 601	3	Fall	Fall
Applied Biostatistics	BIOS 601	3	Fall	Fall
Applied Biostatistics Lab	BIOS 602	1	Fall	Fall
Seminar/Journal Club	BMS 694	1	Fall	Fall
Independent Study	BMS 695	2	Fall	Fall
General Biochemistry or Applied Pharmacology	BIOC 531 PCOL 549	4 4	Spring Spring	Spring Spring
Social & Behavioral Theory	SBHS 601	3	Spring	Spring
Elective listed below		3	Spring	Spring
Independent Study	BMS 695	2	Spring	Spring
Seminar/Journal Club	BMS 694	1	Spring	Spring
Independent Study	BMS 695	2	-	Summer
Special Topics: Professionalism	BMS 793B	2	-	Summer
Total Course Credits		25		
Independent Study Credits		6		
Total Program Credits		31		

A.2. Approved Spring Electives: at least 3 credits

Courses	Code	Credits	Semester
Applied Biostatistics 2	BIOS 603	3	Spring
Applied Healthcare Leadership	HPML 791	3	Spring
Clinical Research Methods	PUBH 662	3	Spring
Environmental Health	OEHS 601	3	Spring
Healthcare and Insurance: Medicaid, Medicare and the Affordable Care Act	HPML 675	3	Spring
Immunology & Biotechnology	PHAR 709	3	Spring
Microbial Pathogenesis	MICB 784	4	Spring
Molecular Diagnosis in Public Health	OEHS 770	3	Spring
Patient Reported Outcomes	PHAR 757	3	Spring
Principles of Clinical Trials	EPID 625	3	Spring
Public Health Toxicology	OEHS 622	3	Spring
Introduction to Research	EDP 612	3	Summer
Public Mental Health	PUBH 586	3	Summer
Introduction to Global Public Health	PUBH 605	3	Summer

A.3. Journal Club

Graduate students in the Master of Science in Health Sciences program take this course. The course is designed to introduce graduate students to current topics in healthcare industry and biomedical sciences. Students will critically read and interpret the literature over a broad range of topics related to evidence based medicine and clinical and translational research. The course will provide opportunities for students to develop skills in public speaking and writing for medical publication. All students will be expected to have read the article and be prepared to discuss it as a group. The journal club will be facilitated by a member of the faculty or an advanced graduate student.

Attendance at journal clubs is mandatory. If you must miss a Journal Club for any reason, you must be excused by the JC faculty coordinator. This can be done by you personally emailing or calling the JC faculty coordinator prior to the journal club. More than 3 unexcused absence will result in a drop of grade. An unexcused absence is one in which you simply do not attend class and fail to inform the JC faculty coordinator prior to the absence. Excused absences will result in your needing to make-up the missed work. This will involve writing a 1-page summary of the paper. More than one excused absence may affect your grade as well.

A.4. Special Topics: Professionalism in Health Care

Graduate students in the Master of Science in Health Sciences program take this course. The course is designed to review the key elements of professionalism that are required for career success in a medical profession. Students will discuss the importance of relationships, fostering teamwork and good communication skills. The course will provide opportunities for students to explore best practices that apply to all health care workers.

Attendance at class is mandatory. If you must miss for any reason, you must be excused by the faculty coordinator. This can be done by you personally emailing or calling the faculty coordinator prior to class. More than 3 unexcused absence will result in a drop of grade. An unexcused absence is one in which you simply do not attend class and fail to contact anyone. Excused absences will result in your needing to make-up the missed work. This will involve writing a 1-page summary of the work missed More than one excused absence may affect your grade as well.

A.5. Training in ethics:

All students will be required to complete the online course in scientific ethics developed by CITI and available on the website for the WVU Office of Research Integrity. In addition to the core module in this training, students will also complete the optional module on plagiarism.

A.6. Independent study

Each student will also design and carry out an independent research project under the guidance of his/her faculty mentors. The topic of the project should align with career interests. Examples can be found in appendix A. The project concludes the end of July for students starting in the Fall semester and the end of April for students starting in Summer session. Each student will present their project orally (12-min talk, 3-min for questions) to the other students and faculty in the program.

B. Summer Skill Development Activities:

Summer semester activities will involve choices of career development activities extending over a 12-week period. Activities 1-3 listed below are on-line and self-paced. Activities 4-6 are conducted at the HSC.

1. MCAT, DAT, or GRE pre-tests are offered to help identify areas of deficiency

2. Formal MCAT or DAT preparation with targeted remediation are offered, using one of the currently available on-line courses offered by Gold Standard or Kaplan. Remediation will involve repeating the relevant portions of the test preparation course, and, for those students taking the MCAT. Tutors will be made available to students.

Note 1: In 2015, the MCAT will change to incorporate more questions pertinent to biochemistry (less organic chemistry), biostatistics, psychology, and cultural sociology. In fact, for the MCATs a fourth category will be added – psychosocial sciences – along with verbal, physical sciences, and biological sciences. With these changes in the MCAT format, options for remediation will change accordingly.

Note 2: The student will be responsible for half the cost of the commercial test preparation course, with the other half paid for by the Program.

3. A second MCAT, DAT, or GRE practice test is offered to evaluate the effectiveness of any remediation.

4. In-house instruction on preparing a competitive application for job placement or to medical, dental, or graduate school, with emphasis on writing a cover letter or personal statement will be offered. Faculty mentors will serve as facilitators for this instruction.

5. In-house sessions on study skills, professional behavior, and effective mock interview skills facilitated by faculty mentors will be offered to students.

6. Opportunities for shadowing of health care providers, facilitated by HSC faculty, will be offered to students. For students interested in medical or dental school, shadowing opportunities and trips to the gross anatomy lab can be arranged and tailored to the interests of the student where possible.

7. For students starting with summer session, this is an ideal time to take any missing prerequisite courses.

8. Summer is a good time to participate in Community Service (20 hours minimum).

IV. ACADEMIC AND PROFESSIONAL STANDARDS

A. Grades

It is expected that students will perform satisfactorily on all required courses. To remain in good standing in the program a student is required to maintain the following standards:

a. An overall grade point average of 3.0 in graduate level coursework.

b. Removal of any incomplete grades within one semester or summer session of their award, unless special permission is granted by the Graduate Studies Committee.

c. BMS 695 Independent Study will be graded S/U. The student should consult the course syllabus to determine what is required to achieve an S. A U in BMS695 will result in the student being placed on probation. A second U will result in dismissal from the program.

d. An incomplete grade must be removed within one semester or summer session of their posting.

Failure to comply with these standards will result in the student being placed on academic probation and may result in dismissal from the graduate program. Withdrawal from courses due to a low grade regardless of the overall GPA at the end of the semester, will be considered a violation of academic standards and could result in probation. For students already on probation, it will be considered a failure to meet the terms of the probation.

B. Evaluation of the Student's Progress

The progress of each student will be reviewed by the faculty at the end of each semester. A member of the mentoring team will be responsible for presenting the progress of their respective student(s). Evaluation will include grades in academic coursework, the reports on independent study progress, and any written accolades or concerns by the advisor.

B.1. Student Code of Academic and Professional Integrity

Developing and practicing high standards for professional conduct are critical for the scientist. Both the University Graduate Council and the Graduate Faculty consider

maintaining scientific integrity to be of utmost importance. All students are required to complete the CITI training in Scientific Ethics. All students are directed to be familiar with the University's policy on this subject. This can be found at:

http://oric.research.wvu.edu/rcr_train

Student behavior should always reflect the utmost in professionalism. All students should be familiar with the WVU Student Conduct Code, which can be found at:

http://campuslife.wvu.edu/r/download/220286

Students should pay particular attention to the avoidance of plagiarism in all writing.

http://catalog.wvu.edu/graduate/enrollmentandregistration/#academicintegritytext

The University's definition of plagiarism is:

" The term “plagiarism” includes, but is not limited to, the use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials. "

Students who have any questions regarding what constitutes plagiarism should request clarification from the faculty before embarking on any writing assignment. Failure to adhere to these standards of scientific integrity will result in disciplinary action by the graduate faculty and may jeopardize the student's status in the graduate program.

C. Vacations, Sick Leave, and Work Schedules

The students will adhere to the University calendar and break schedule for their coursework. Because the independent study project is ongoing throughout the year, the student should expect to spend the breaks between the fall and spring semester and the spring semester and summer session, to move this project forward.

There is no plan for sick leave for students. Students who are sick will need to inform course faculty of this and arrange to get notes and make up the work. Any policies that instructors have for absences from their courses will apply to the students in this program. The student is cautioned that the degree is granted based on completion of all components and thus frequent absences can jeopardize the completion of the independent study project. As part of the student’s professional training, they are advised to adopt habits that promote health, such as proper nutrition, hygiene, regular exercise, and sufficient sleep.

Students who need an extended absence (greater than 1 week) from the program due to illness, pregnancy, or personal issues will need to request a formal leave of absence from the program. The University and Health Science Center Guidelines need to be followed to apply for this.

V. STUDENT MENTORS

A. Selection of mentors

At the admission's interview, the student and interviewers will work to identify an initial interest in an area of emphasis. Admitted students will be assigned faculty mentors based on this interview and the results of their individual development plan. The mentoring team will be include the faculty mentor that is guiding the independent study project (research mentor) and the Director of the MS program or designee (academic mentor).

B. Schedule for Meetings

Students should meet face to face with their mentors at least every other week and keep in email content between then. The academic mentor should be informed of the results of all exams.

VI. COMPLETION OF THE DEGREE

A. Timetable for completion (from the University Catalog)

Master's degree students are permitted to continue in a program for a maximum of eight years under their original application. Students who have been inactive for two or more years, or who do not enroll for one year after initial admission, are required to apply for, and be accepted for readmission. The application fee is assessed for reapplication. Graduate work planned with the student's advisory committee (e.g., plan of study) must be satisfactorily completed within a period of eight years immediately preceding the conferring of the degree. A course taken more than eight years previously must be revalidated if it is to be used towards meeting degree requirements. Revalidation can be accomplished by submitting the following information for approval to the Office of Graduate Education and Life:

- A letter from the course instructor listing the criteria used to revalidate the course material
- A copy of the student's performance on the student's revalidation examination
- A letter from the college/school graduate coordinator and/or dean supporting the revalidation

B. Admission to graduate and professional degree programs

This course of study is designed to enhance the student's competitiveness and preparedness for admission to advanced degree programs. Students are encouraged to discuss this thoroughly with their mentoring team. Completion of the MS in Health Sciences does not guarantee an interview or admission to any program or attainment of any position.

Appendix A. Examples of Independent Study Projects

The independent study project involves 6 credits of the core curriculum and will be a research project involving either bench science, clinical research or population/public health research. The project will be conducted with one of the mentors or heavily supervised by the mentor. The outcomes will be summarized in manuscript format as well as presented orally. Examples of potential projects are:

1. Testing of a hypothesis in a research laboratory. This is not unlike experiences that we already offer to first year basic science graduate student in the form of laboratory rotations or undergraduates taking research credits.

2. Retrospective analysis of clinical outcomes. Such projects are routinely done by medical students as research rotations or summer activities.

3. Testing of a hypothesis using existing community interventions. We have a number of projects in the HSC that involve interacting with groups in the community for specific health related interventions.

4. Secondary analysis of a national database, e.g., NHANES.

5. Participation in data management for an existing clinical or community study, e.g., the CARDIAC project.

Signature Page

I have read and understand the Handbook of the Master of Science in the Health Sciences. I agree to abide by the requirements outlined in this document as well as the University requirements governing these degrees.

Signature: _____

Name (printed): _____

Date: _____

I pledge to adhere to the University and program guidelines governing academic and professional standards as found in the following documents:

WVU Campus Student Code of Conduct

http://campuslife.wvu.edu/r/download/220286

Academic and Professional Integrity for the Ph.D. and M.S. degree

http://catalog.wvu.edu/graduate/enrollmentandregistration/#academicintegritytext

Section B.1 of this handbook

and to maintain the highest standard of scientific integrity

http://oric.research.wvu.edu/rcr_train

Signature: _____

Name (printed): _____

Date: _____