Masters of Medical Science Program

UTMB
The University of Texas Medical Branch

STUDENT HANDBOOK

2009 - 2010

GRADUATE SCHOOL
OF
BIOMEDICAL SCIENCES
PROGRAM DESCRIPTION

The Master of Medical Science (MMS) Program is a very flexible and cost-effective academic opportunity to validate, recognize, and enhance the research experience of clinicians wishing to perform biomedical research. The category of clinicians encompasses dentists, veterinarians, and physicians, including residents, fellows, and faculty of UTMB clinical departments.

PURPOSE:

The Masters of Medical Science Graduate Program provides individualized guidance, training, and support to educate clinicians in critical aspects of biomedical research. The program may also be viewed as part of a path to become a biomedical scientist. These goals are achieved through the following five (5) MMS Program Objectives:

1. Promote the development of in depth knowledge of research methodology, data analysis, and critical thinking.
2. Generate opportunities to interact and collaborate with basic scientists and physician-scientists involved in cutting edge technologies.
3. Provide a formal research experience with medical applications.
4. Provide opportunities to develop an awareness of positive social, ethical, and scientific perspectives.
5. Prepare students for a career in Academic Medicine.

To achieve its objectives, the Masters of Medical Science Graduate Program requires students to:

1. Pursue an intensive full-time research experience in one area of biomedical research.
2. Obtain a solid theoretical foundation in a broad subject area encompassing their focus of research. More specifically, students will demonstrate knowledge of a defined medical research project by presenting an oral defense examination to a panel of research faculty experts.
3. Develop required technical skills, including bench work, informatics, and statistics, and attain mastery of independent problem solving.
4. Register for and complete a minimum of thirty semester credit hours of graduate credit.
5. Register and complete Ethics of Scientific Research Course MEHU 6101.
6. Demonstrate effective oral and written communications skills that can be successfully applied to the pursuit of external funding and the publication of research findings.
APPLICATION PROCESS:

MMS Applicants must hold one of the following clinical degrees: M.D., D.V.M., D.D.S., or D.O (or their equivalents for international students).

The admissions process is divided in two parts:

Part I:

1. **Contact the program director (gvalbuen@utmb.edu)** for a personal interview and to obtain help in the application process.

2. **Letter of Intention to Sponsor from the Proposed Supervisor.** This letter should state that the person agrees to be supervisory chair. (Attn: Gustavo Valbuena, M.D., Ph.D., Masters of Medical Science Program Director, UTMB Route 0609).

3. **Complete and submit an application form.** If you want an application form, please contact: Enrollment Services Phone (409) 772-1215
   E-Mail: Enrollment.Services@utmb.edu
   Web: http://www.utmb.edu/EnrollmentServices or
   Apply on-line via UTMB web: www2.utmb.edu/utmbapp/app_options.htm

4. **Submit Official Certified transcripts** from schools attended that granted M.D., D.V.M., D.D.S., or D.O degree.

   For students who have completed their education at foreign schools: If the documents are not in English, a certified English translation must be submitted in addition to official original transcripts. Because of delays in receiving transcripts from foreign schools, it is suggested to request these months prior to the anticipated date of enrollment. Please mail transcripts directly to:
   
   Office of the Registrar
   University of Texas Medical Branch
   301 University Boulevard
   Galveston, Texas 77555-1305

5. **Satisfy the Language Requirement:** If your native language is not English, you are required to take and score satisfactorily on the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS)). A satisfactory score on the TOEFL is 550 (paper-based), 213 (computer-based), or 80 (internet-based), and a satisfactory score on the IELTS is 6.5. If your native language is not English and you are proficient in the English language and have not taken the TOEFL exam, you should obtain a letter from your supervisory professor requesting a waiver of the TOEFL/IELTS exam certifying that you are proficient in the English language and that your communication skills are very effective both verbally and in writing.

6. **Application Fees.** Applications are not processed until the application fee is paid.
   
   U.S. applicants $30        Foreign applicants $75

Please plan on completing your application one month before the beginning of the semester (Fall, Spring, or Summer) in which you wish to enroll.
Part II: Concomitant with admission to the Graduate School, the student must obtain the following:

7. **Letter from the Chairman of the student's clinical department.** The letter should state that the department endorses the application and guarantees relief from routine patient-care duties for a one-year, full-time equivalent. If you are not practicing routine patient-care duties, please provide a letter stating that you are not practicing routine patient-care.

8. **Research Proposal outline.** The MMS student applicant, in consultation with his/her Mentor/Supervisory Chair, must submit a one to two page document outlining the research proposal. The MMS Steering Committee reviews each research proposal outline. A majority vote of the MMS Steering Committee is required to recommend acceptance to the MMS program to the Dean of the GSBS. The format for the outline is that recommended by NIH for the Specific Aims section of grant proposals. Use the example found here: [http://www.niaid.nih.gov/ncn/grants/app/aims.pdf](http://www.niaid.nih.gov/ncn/grants/app/aims.pdf). For more information look at [http://www.niaid.nih.gov/ncn/grants/app/default.htm](http://www.niaid.nih.gov/ncn/grants/app/default.htm) and read the information provided below.

**MMS PROGRAM REQUIREMENTS**

The following diagram depicts the general timeline:

### Master in Medical Sciences Program Timeline

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<th>First Term</th>
<th>Second Term (up to a maximum of 4 terms)</th>
<th>Last term</th>
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<td>• Register MMSC 6097 (research) and Ethics of scientific Research (MEHU 6101, only offered in May). ◆&lt;br&gt;• Select supervisory committee.&lt;br&gt;• Submit full written proposal to Supervisory Committee for approval.&lt;br&gt;• Oral defense of approved written proposal and oral examination.&lt;br&gt;• Request admission to candidacy.</td>
<td>• Register MMSC 6098 (thesis) and any other optional course.&lt;br&gt;• Pursue research activities related to the approved project.&lt;br&gt;• Present progress report to supervisory committee for approval and recommendations.&lt;br&gt;• Submit summary of progress report and supervisory committee recommendations to program director.</td>
<td>• Register MMSC 6098 (thesis).&lt;br&gt;• Finish research activities related to the approved project.&lt;br&gt;• Write and submit research findings as a manuscript to a peer-review journal.&lt;br&gt;• Notify program director of the submission.&lt;br&gt;• Schedule oral defense of the submitted paper with supervisory committee.&lt;br&gt;• Complete graduation packet.</td>
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◆ Students planning to begin the MMS program in the summer or fall semesters are encouraged to complete the following three-day course which is offered only in May: Ethics of scientific Research (MEHU 6101). For this
purpose, the prospective student will request an appointment as a special student to the Dean of the GSBS. Please contact the MMS program director to direct your request to the Dean of the GSBS.

- If the student does not pass the defense and oral examination or for any other reason cannot defend on term 1, he or she can Register MMSC 6097 (research) for term 2.

After formal acceptance into the MMS Program, the student, with the support of his or her supervisory professor, must prepare for the following milestones.

1. **Selection of a supervisory committee.**

   Within the first semester of acceptance into the program, the student, under his or her mentor advice, will name a supervisory committee to oversee the proposed research. It is the students' responsibility to contact all prospective members and determine that they are willing to be members. The supervisory committee is made up of three (3) members:

   - Supervisory professor, who will chair the committee.
   - A basic scientist from the student's department. This person must be a member of the GSBS. If this person is not a member of the GSBS, his or her CV must be submitted to the MMS program director who will then recommend this person to the Dean of the GSBS for either a special appointment or a permanent appointment.
   - A clinician scientist from the student's department. This person must be a member of the GSBS. If this person is not a member of the GSBS, his or her CV must be submitted to the MMS program director who will then recommend this person to the Dean of the GSBS for either a special appointment or a permanent appointment.

   It is the responsibility of the student to produce a letter signed by the committee members in which they agree to serve in that role and state that they have read and understood the Student Handbook (the student will provide a current version of the MMS Student Handbook). This letter will be submitted to the MMS Program Director for pre-approval. The MMS Program Director will then forward the request to the Dean of the GSBS for final approval.

2. **Writing, submission, and approval of full proposal.**

   During the course of the first semester of enrollment, the student will write, under the supervision of his or her mentor, a full proposal describing the proposed research. The proposal will follow the most recent NIH format instructions. The following are important resources that you should read and follow:

   - We strongly recommend the following book for assistance in preparing your grant proposal: [http://www.grantcentral.com/workbooks.html](http://www.grantcentral.com/workbooks.html). This workbook is
a very practical, step by step guide to the philosophy and proven techniques for the writing of successful grant proposals.

The text should be divided into the following sections (page recommendations are approximate):

- Abstract (1/2 page): a concise synopsis of the proposal with hypotheses and 2-3 specific aims (does not count in 10 page limit).
- Hypothesis and Specific Aims (1 page).
- Background & Significance (2-3 pages): why the topic is important, why the hypothesis is plausible, and how each specific aim addresses the hypothesis to be tested.
- Preliminary Data (1-2 pages).
- Research Design & Methods (3-4 pages): a logical experimental plan, with details of how you will address the specific aims, rationale for use of specific techniques, plans for interpreting anticipated results, identification of limitations, the alternatives available if an approaches/technique does not work out. Remember to include controls (negative and positive if appropriate) and the appropriate statistical analyses that are required.
- Literature cited (no page limit). Where possible you should read original papers and keep citations of review articles to a minimum. Remember that if you cite a paper it is assumed that you have actually read it.

The student should understand every word, experimental approach, and technique that is part of the proposal. Have a rationale for everything you propose. Provide an analysis of the limitations and potential pitfalls of each and every approach. Provide alternative approaches whenever possible.

The written proposal will be submitted to the members of the student’s supervisory committee who will review it following the most recent NIH guidelines. The following resources are available:

- [http://grants.nih.gov/grants/peer_review_process.htm](http://grants.nih.gov/grants/peer_review_process.htm)
- [http://grants.nih.gov/grants/peer/reviewer_guidelines.htm#r_awards](http://grants.nih.gov/grants/peer/reviewer_guidelines.htm#r_awards)
- [NOT-OD-09-025](http://grants.nih.gov/grants/peer/peer.htm)

A grade of Pass or Fail will be assigned to the written proposal by each member of the supervisory committee. If any member of this committee assigns a Fail grade, the student will have one more chance to rewrite the proposal. The student must obtain a unanimous Pass grade on a second round of review in order to continue in the MMS program.

The Chair of the student’s Supervisory Committee will inform the student and the MMS program director in writing about the performance of the student in the evaluation of the written proposal. Students that do not successfully complete this part of their
training cannot enter candidacy and are therefore subject to dismissal from graduate school.

3. The Oral Examination.

When the student obtains a Pass grade on the written proposal, he or she will schedule an oral examination with the Supervisory Committee. Students are responsible for contacting all members of their committee and coordinating the time and location of their examination (Kim Fox, the program coordinator, can reserve the conference room in 5.224 Mary Moody Northern Pavilion). This examination is expected to occur within the first semester of enrollment and in time to process the request of admission to candidacy (at least two to three weeks before registration for the following semester).

The oral examination is designed to: 1) tests the student’s general knowledge of biomedical research in his or her area of concentration and the general field that frames the research proposal; 2) assess creative, critical, and rational thought; 3) test the candidate’s understanding of the basis of research methods; and 4) to evaluate the student’s aptitude for research.

The student will prepare an oral presentation of the approved written proposal. The total presentation/examination should last no more than three hours. The format is variable and should be discussed with the Chairman of the Supervisory Committee. It can, for example, be a 45 minute presentation followed by questions, or can be a longer presentation with Committee members asking questions during the presentation. Questions that will be asked will focus on your proposal/presentation but can take many forms. Be prepared to explain methodologies (formulae, what specific reagents do, etc.), experimental plans (use of controls, etc.), data analysis (statistics), etc. Remember that questions are not limited to the proposal but can also include knowledge that can reasonably be expected based upon the students research interest and academic background.

After the presentation and examination, the student’s Supervisory Committee will assign a Pass or Fail grade. If any member of this committee assigns a Fail grade, the student will have one more chance to orally defend the proposal and pass the examination. The student must obtain a unanimous Pass grade on a second round of examination in order to continue in the MMS program.

The Chair of the student’s Supervisory Committee will inform the student and the MMS program director in writing about the performance of the student in the oral examination. Students that do not successfully complete the examination cannot enter candidacy and are therefore subject to dismissal from graduate school.

4. Admission to candidacy.

Upon satisfactory completion of the oral examination, the student must apply to be admitted to candidacy for the MMS degree by sending a written request to the MMS program director who will, in turn, recommend admission to candidacy to the Dean of the GSBS. It is the responsibility of the student to make sure that the Chair of the Supervisory Committee submits the grades to the MMS Program Director before
applying to candidacy. This should happen at the end of the first semester so she or
he can register MMSC 6098 (thesis) for the following semester. The student should
allow one week for processing of the request. Students may register for Thesis up to
four subsequent terms until graduation.

5. Conduct of research.

During the research component of the work toward the MMS degree, the student must
be enrolled in the MMSC 6098 Thesis course offered each term by the graduate
school. As part of the requirements of this course, the student must present an oral
progress report to the members of the Supervisory Committee and forward a short
written research progress report to the MMS program director with comments from the
Chair of the Supervisory Committee.


After completion of the proposed research, the student will prepare an oral
presentation to discuss his or her research results with the members of the
Supervisory Committee. Students are responsible for contacting all members of their
committee and coordinating the time and location of their defense (Kim Fox, the
program coordinator, can reserve a conference room in Mary Moody Northern
Pavilion). Students will receive feedback for approaching the following and final step
of the MMS program. It is recommended that the oral defense be scheduled in such a
way that there will be enough time to write the article (next step) and process the
graduation package by the end of the semester.

7. Writing a Scholarly Report.

After satisfactory defense of the student’s research results and conclusions, the
student will write a manuscript with the results of his or her research for submission to
a PubMed-indexed journal. The following criteria pertain:

- The student must write the article and be first author.
- The student must submit evidence of the submission to the program director.
- The supervisory professor will provide the MMS program director a Signature Page,
  which must bear the signature of each member of the Supervisory Committee, and
  must certify that each has approved the oral defense as well as the manuscript.
- A single paper cannot serve to meet the MMS publication requirement for more
  than one MMS student.

Once all requirements are completed, the MMS program director will recommend to
the Dean of the GSBS that the MMS degree be granted to the graduating student. At
this point, the Program Coordinator will help the student with processing the graduation
package.

MMS COURSE REQUIREMENTS:

- MMSC 6097 Research course. This course initiates the formal research training directed
toward a Master of Medical Science degree. During this course, the student will select a
supervisory committee, submit full written proposal for approval, orally defend the
approved written proposal, and request admission to candidacy. Grading is based on the student's level of performance as reported by the student's supervisory professor assigned as satisfactory or unsatisfactory. (3 - 10 credits).

   Course grades: S/U
   Term offered: I, II, III.
   Year offered: Annually.

- **MMSC 6098 Thesis course.** Once admitted to candidacy, the student will pursue the proposed research and present a progress report to the supervisory committee for approval and recommendations. In the last semester, the student will finish research activities related to the approved project, prepare an oral defense of his/her thesis, and write and submit his or her research findings as a manuscript to a peer-review journal. Grading is based upon the student's level of performance as reported by the chairperson of the student's supervisory committee. Students registered for thesis are expected to register for a total of nine credit hours each term. (3 - 10 credits).

   Prerequisite: Admission to candidacy for the master's degree.
   Course grades: S/U
   Term offered: I, II, III.
   Year offered: Annually.

These courses are not designed in a classroom setting. The student selects a laboratory sponsor and a supervisory professor that will enable the student to conduct their proposed research.

- **MEHU 6101 Ethics of Scientific Research course.** This required course is a small-group discussion that explores ethical issues in the conduct of scientific research. Students meet with course faculty to discuss readings and cases dealing with the philosophy of science, the ordinary practice of scientific research, conflicts of interest, and the value conflicts that arise between scientists and society at large. Course grades (S/U) will be determined by attendance, which is required at all sessions (60%), and adequate class participation based on an understanding of the basic concepts of the course (40%).

It is mandatory for all GSBS students to enroll in this classroom-based course offered once a year in May. One cannot graduate until this course is completed.

Students planning to begin the MMS program in the summer or fall semesters are encouraged to complete this course as early as possible. For this purpose, the prospective student will request an appointment as a special student before admission to the program. Please contact the MMS program director to direct your request to the Dean of the GSBS.
GSBS REQUIREMENTS

GSBS Requirements for Full-Time Registration. UTMB Graduate School for Biomedical Sciences (GSBS) Policy requires that all degree-seeking students must be enrolled full time, registering for at least nine hours a semester.

It is possible to request a waiver on a semester-by-semester basis. A request for such a waiver should be made in writing to the MMS program director, who will then forward the request to the dean for approval if it has appropriate justification. At the dean's discretion, waivers may be granted for full-time UTMB employees, for those with significant clinical responsibilities, and for others in special circumstances. Waivers from this full-time requirement are not possible for students on stipend. Only full-time students are eligible for stipends.

Each master's degree student must spend at least one year enrolled as a student in residence in the Graduate School of Biomedical Sciences. Exceptions to the residence requirement must be obtained in writing from the candidate's supervisory committee and the dean of the graduate school.

The Graduate School also requires that each degree-seeking student must spend one year in residence as a full-time student or seek a special waiver as spelled out in Sections 4.6111 and 4.6211 of the Graduate School's Bylaws and Academic Policies (available on the GSBS web site: http://www.gsb.utmb.edu/).

Note: The minimum time to complete MMS degree is one year - three terms.

Resources for our MMS program graduates

Clinician-scientists interested in pursuing an academic career in the United States should explore the possibility of applying to a KO8 award from NIH. For more information, visit http://grants.nih.gov/training/careerdevelopmentawards.htm.
MMS PROGRAM CONTACTS

MMS PROGRAM DIRECTOR

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MMS PROGRAM COORDINATOR

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ADDITIONAL INFORMATION

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FACTS ABOUT UTMB STUDENTS, RESEARCH AND OUR COMMUNITY

http://www.utmb.edu/
http://www.gsbs.utmb.edu/
http://www.utmb.edu/departments.asp