



Medical Science Student Handbook 2020-21

The information provided in this document serves to supplement the requirements of the Graduate School of Biomedical Sciences detailed in the UNTHSC Catalog with requirements specific to the discipline of Clinical Research Management.

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Medical Science

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Program Description

The Master of Science program in Medical Sciences is designed to provide additional educational and training opportunities to individuals who would like to enhance their credentials for entry into medical, dental, or other professional schools. This is achieved by offering a strong, challenging biomedical sciences curriculum in the environment of a health science center.

We recognize that there are bright, highly motivated students whose goal is to become a physician, dentist, or other health professional but an unexpected roadblock prevents their entry into these competitive professional schools. Examples of these roadblocks include non-competitive grade point average, borderline Medical College Admission Test (MCAT), DAT or GRE score, marginal letters of evaluation, or insufficient clinical exposure. The Medical Sciences Program is also designed for those students who want to experience an intensive academic curriculum in a medical school setting before deciding whether medicine is the career for them.

Our graduate-level science program is designed to enhance student's knowledge and skills before they apply/reapply to professional school. The average time to complete the non-thesis M.S. degree in Medical Sciences is twelve months. Our classroom-based program is offered mid-May through mid-May. Our online program is offered mid-August through mid-August. The classroom-based program only admits students in the summer semester. The online program only admits students in the fall semester.

Opportunities for Graduates in Medical Sciences

The M.S. in Medical Sciences program responds to the need for graduate study in the medical sciences by providing students with the background required for the pursuit of a variety of careers in the health professions. It is a broad-based curriculum that can provide the student with requirements to pursue medical school, dental school, veterinary school, advanced graduate education, or enter a career in allied health sciences, such as teaching, public health and health care administration, or in non-research positions including managerial and biotechnology patent law.

Program Success

The Medical Sciences Program has been very successful in improving student's chances for acceptance into medical and other professional schools. Over the last 3 years, on average, 90% of

students who matriculated graduated with a Master’s of Science degree. Of these students, 75-80 % were successful in matriculating into medical, dental, or other professional schools. We recommend that medical school applicants apply as early as possible in the application cycle and apply broadly to many medical schools throughout Texas and the United States via TMDSAS, AMCAS, and ACCOMAS. Fifteen percent (15%) of the students chose to pursue graduate degrees in other fields at UNT Health Science Center or at other institutions.

Program Requirements

The requirements for admissions and graduation are listed in the [GSBS Degree Programs](#) chapter of the [UNTHSC Catalog](#).

A student admitted to the Medical Sciences program must follow the lock-step curriculum. A minimum GPA of 3.0 must be maintained.

Each student is responsible for the completion of the core requirements for the Medical Science program according to the procedures that follow. Each item must be completed in the sequence and time period indicated. Forms are subject to revision at any time and should be obtained from the Graduate School of Biomedical Sciences’ web site.

Medical Science Curriculum/Degree Plan, Classroom-based

The following curriculum is required for all students enrolled in the Medical Science program. The typical time-to-degree for MS students is twelve months.

<i>Dept</i>	<i>Course Number</i>	<i>Title</i>	<i>SCH</i>	<i>Semester to be Completed</i>
BMSC	5100	Application and Skills Workshops	1	Summer Year 1
BMSC	5201	Clinical Practice Preceptorship	2	Summer Year 1
BMSC	5102/03/04	MCAT/DAT/GRE Preparation	2	Summer Year 1
BMSC	5225.002	Introductory Biochemistry (optional)	2	Summer Year 1
BMSC	5300	Biostatistics for Biomedical Science	3	Summer Year 1
BMSC	5390	Short Course in Health Disparities	1	Summer Year 1
		<i>Subtotal</i>	7-11	
BMSC	5301	Principles of Biochemistry	3	Fall Year 1
BMSC	5302	Molecular Cell Biology	3	Fall Year 1
BMSC	5303	Immunology and Microbiology	2	Fall Year 1
BMSC	5231	Introduction to Health Disparities Issues in the United States	2	Fall Year 1
BMSC	5350	Principles of Epidemiology and Evidence-based Medicine	3	Fall Year 1
PHAN	5400	Histology	2	Fall Year 1
		<i>Subtotal</i>	15	
BMSC	5304	Physiology	5	Spring Year 1
BMSC	5305	Pharmacology	2	Spring Year 1

<i>Dept</i>	<i>Course Number</i>	<i>Title</i>	<i>SCH</i>	<i>Semester to be Completed</i>
BMSC	5312	Introduction to Clinical Research & Studies	3	Spring Year 1
BMSC	5121	Ethical, Legal and Social Issues for Responsible Clinical Research	2	Spring Year 1
PHAN	5401	Gross Anatomy	5	Spring Year 1
		<i>Subtotal</i>	17	
		<i>Total</i>	39-43	

Medical Science Curriculum/Degree Plan, Online

The following curriculum is required for all students enrolled in the Medical Science program. The typical time-to-degree for MS students is twelve months.

<i>Dept</i>	<i>Course Number</i>	<i>Title</i>	<i>SCH</i>	<i>Semester to be Completed</i>
BMSC	5100	Application and Skills Workshops	1	Fall Year 1
BMSC	5301	Principles of Biochemistry	3	Fall Year 1
BMSC	5302	Molecular Cell Biology	3	Fall Year 1
BMSC	5303	Immunology and Microbiology	2	Fall Year 1
BMSC	5231	Introduction to Health Disparities Issues in the United States	2	Fall Year 1
BMSC	5350	Principles of Epidemiology and Evidence-based Medicine	3	Fall Year 1
PHAN	5400	Histology	2	Fall Year 1
		<i>Subtotal</i>	16	
BMSC	5100	Application and Skills Workshops	PR	Spring Year 1
BMSC	5121	Ethical, Legal and Social Issues for Responsible Clinical Research	2	Spring Year 1
BMSC	5305	Pharmacology	2	Spring Year 1
BMSC	5312	Introduction to Clinical Research & Studies	3	Spring Year 1
PHAN	5301	Structural Anatomy	3	Spring Year 1
PHAN	6501	Neuromuscular Physiology	1	Spring Year 1
PHAN	6502	Endocrine Physiology	1	Spring Year 1
PHAN	6503	Cardiopulmonary Physiology	2	Spring Year 1
PHAN	6504	Gastrointestinal-Renal Physiology	1	Spring Year 1
		<i>Subtotal</i>	15	
BMSC	5100	Application and Skills Workshops	PR	Summer Year 1
BMSC	5102/03/04	MCAT/DAT/GRE Preparation	2	Summer Year 1
BMSC	5201	Clinical Practice Preceptorship	2	Summer Year 1
BMSC	5225.002	Introductory Biochemistry (optional)	2	Summer Year 1

<i>Dept</i>	<i>Course Number</i>	<i>Title</i>	<i>SCH</i>	<i>Semester to be Completed</i>
BMSC	5300	Biostatistics for Biomedical Science	3	Summer Year 1
BMSC	5390	Short Course in Health Disparities	1	Summer Year 1
		<i>Subtotal</i>	<i>10-12</i>	
		<i>Total</i>	<i>41-43</i>	

Application and Skills Workshops carry 1 SCH and participation in all workshops is mandatory to pass this course. These workshops are designed to help students improve their non-academic qualifications such as interviewing skills and writing essays and to help students develop the survival skills necessary to perform well in graduate and professional school.

MCAT/DAT Preparatory Workshop is required of all students in the Medical Sciences program. Students who have earned a MCAT score of 508 or a DAT score of 20 or higher may petition for a waiver of this requirement. To petition for a waiver, send an e-mail to the Executive Director of Student Services, Carla.Johnson@unthsc.edu. The course will be graded Pass/Fail.

Introductory Biochemistry is an *optional* course that MS in Medical Sciences students may elect to take to review basic biochemistry. The course will be graded Pass/Fail.

All Course Descriptions can be found in the Catalog

<https://www.unthsc.edu/graduate-school-of-biomedical-sciences/catalogs/>

Academic Dishonesty: Instances of cheating or other academic dishonesty will be handled according to the Policies of the University of North Texas Health Science Center, Section 07, *Number 7.126 Student Code of Conduct and Discipline*.

The Health Science Center reserves the right to make changes at any time to reflect current board policies, administrative regulations and procedures, amendments by state law and fee changes. Information provided in this document is subject to change without notice and does not constitute a contract between the University of North Texas Health Science Center and a student or an applicant for admission. The institution is not responsible for any misrepresentation or provisions that might arise as a result of errors in preparation.

Medical Sciences Research Track

Students who want to spend a research year concentrating in one of the biomedical sciences (such as anatomy, physiology, pharmacology, pharmaceutical science & pharmacotherapy) may apply to the Medical Sciences Research Track (1 additional year only). The successful applicant to this track will have excelled in the requirements for the Medical Sciences degree, and expressed a strong interest in anatomy, physiology, pharmacology, neuroscience, genetics, pharmaceutical science & pharmacotherapy education and/or research. In addition to the Medical Sciences curriculum, students will undertake a combination of additional courses and independent project(s) and produce an Internship Practicum Report on the research project. Students will work with an advisory committee for the production of the practicum report.

Application and Transfer to Medical Science Research Track

The Medical Sciences Research Track adds an additional year to the students' program. Students complete this track transfer from the traditional Medical Sciences Program into the Research Track at the end of the spring semester of year 1 and graduate the following academic year. Application for transfer includes submitting a CV/resume and application form, as well as interviewing with at least three faculty with whom they are interested in working. The student will list the faculty in order of preference on their application form. A selection committee will discuss and decide on placement for each student based on the students' preferences and faculty agreement to take the student.

The application requires students to address the following:

- What is your interest and motivation for applying to this program?
- Describe your previous teaching experience, if any.
- Describe your previous research experience, if any.
- What are your expectations about the program, and what do you hope to accomplish?
- What is your primary area of research interest?
- What makes you an outstanding candidate for this opportunity?

Selection criteria include:

- Academic performance in the first year of course work; must have a minimum 3.0 GPA
- Students must have completed all the first-year coursework to be considered for the Medical Sciences Research Track.
- Physiology: must have earned a grade of "B" in BMSC 5304: Physiology
- Anatomy Track: Must have earned a grade of "A" in both PHAN 5400: Histology, and PHAN 5401: Structural Anatomy courses, and demonstrate an interest in anatomy education and/or research
- Student who have earned a grade of "C" in any courses will not be admitted into the Medical Sciences research track.
- Excellent written and oral communication skills
- Demonstrate ability to independently complete projects
- Intellectual curiosity, demonstrated ability to articulate project ideas

Medical Science Research Track Curriculum/Degree Plan

The following additional curriculum is required for all students enrolled in the research track:

<i>Dept</i>	<i>Course Number</i>	<i>Title</i>	<i>SCH</i>	<i>Semester to be Completed</i>
		Students take same curriculum as above	40-42	Year 1
BMSC	5998	Independent Research	6	Summer Year 2
		<i>Subtotal</i>	6	

BMSC	5998	Independent Research and/or Elective Courses	9	Fall Year 2
		<i>Subtotal</i>	9	
PHAN	6100	Anatomy Laboratory Teaching Practicum (Anatomy Track students only)	2	Spring Year 2
BMSC	5697	Internship Practicum	7-9	Spring Year 2
		<i>Subtotal</i>	9	
		<i>Subtotal for Year 2</i>	24-26	
		<i>Total</i>	64-68	

Elective Courses could include those deemed appropriate by the student's major professor and advisory committee. Students must be enrolled in a minimum of 5 hours of BMSC 5898 in the fall semester and a minimum 7 hours of BMSC 5697 in the spring semester. All Course Descriptions can be found in the Catalog

<https://www.unthsc.edu/graduate-school-of-biomedical-sciences/catalogs/>

Description of the Internship Practicum for the Research Track

The Research Internship Practicum provides the student with a hands-on training experience by conducting independent research. The internship takes place on-campus with the faculty in the Graduate Program. During the spring semester of the second year, the student will enroll in Internship Practicum (BMSC 5697) for 7-9 SCH. Additional course work will be optional. Students will produce a Final Practicum Report focused on this research in collaboration with their major professor and an advisory committee. At the conclusion of the practicum, there will be an oral presentation and defense of this report. All students in the Research Track must satisfy all other requirements of the Medical Sciences Master's program as directed by the GSBS before graduation.

Throughout the one-year research track program, students will be available five (5) days a week, usually from 8:00 a.m. until 5:00 p.m., however the exact work schedule will be determined with the advisory committee.

Description of the Student Internship Practicum Project

The Internship Practicum project may be an extension of independent research the student has undertaken in summer and fall semesters preceding enrollment in the Internship Practicum. Students can expect to spend at least 40 hours per week on their project(s) for the internship. Practicum projects are developed with input from the student advisory committee, which is primarily composed of faculty affiliated with the GSBS.

UNTHSC does not offer any remuneration to the student when he/she is enrolled in any of the courses through the research track year, and the student should not expect to be paid as an intern. No student should consider that the internship site has any obligations to pay, hire or in any way retain a student during or after the internship or after graduation.

A formal plan (research proposal) describing how the practicum is to be spent must be approved by the advisory committee and submitted before the end of fall semester (Year 2).

At the end of Internship Practicum (BMSC 5697), students will present their work as both oral and written reports. The oral presentation will be open to the public and will then be followed by a private defense with the advisory committee. The student must submit a drafts of his/her Internship Practicum report to the major professor prior to the defense for review. The major professor must approve the Internship Practicum report prior to the student submitting it to advisory committee members. The final written report should be given to the committee no later than two (2) weeks before the final defense. Students should coordinate the reservation of a seminar room with the Graduate School office no later than one (1) month prior to their defense. At the time of the defense, the committee will either approve/or not approve the work of the internship and the written report. If not approved, the student may have a chance to revise the written report or repeat the practicum one time at the discretion of the committee. The major professor together with the other members of the committee will assign a letter grade to the practicum. The report must be submitted in accordance with the instructions for completing graduation requirements within the deadlines for graduation published in the academic calendar. A more detailed description of the Internship Practicum and report requirements may be found in the Internship Practicum Guidelines available on the GSBS graduation website.

Duration and Time of the Internship

While the Internship Practicum course takes one (1) semester, it is expected that the student will prepare and plan for the practicum project and report during the preceding summer and fall semesters, with guidance from their major professor and advisory committee. If the student does not complete the Practicum Project in the time frame stipulated in his/her program, the student may register for additional hours of BMSC 5697 (9 SCH per semester).

Activities during the Practicum Project

Throughout the year, the major professor, with input from the graduate faculty Advisory Committee, will assign the student responsibilities that have been previously agreed upon and approved in the Internship Practicum Proposal.

Proprietary Studies and Agreements

The major professor will also work with the student to ensure that no proprietary information is contained within any public documents submitted by the student to UNTHSC.

Student Advisory Committee

Each student will be assigned a minimum three-person Advisory Committee. This committee will include the major professor and two (2) other members of the graduate faculty of UNTHSC. The committee guides the student in determining internship goals and approves the research/internship proposal. The advisory committee reviews the Research Proposal and Final Internship Practicum Report, administers the final defense examination for the degree, approves the internship practicum report before submission to the Graduate School and determines the final grade for the internship. The major professor serves as chair of the advisory committee.

Each student is required to meet with his/her advisory committee early in the summer semester of year 2 to sign the Designation of Committee Form and to approve the Degree Plan (<https://www.unthsc.edu/graduate-school-of-biomedical-sciences/forms-and-guidelines/>) and discuss goals for the research year. Students must meet with the advisory committee during the fall semester before beginning the Internship Practicum (BMSC 5697) to discuss the research practicum, and then meet as necessary until the final defense.

A Degree Plan listing all courses must be completed by the student, approved by the student's advisory committee and submitted to the graduate dean immediately following the first advisory committee meeting. All subsequent requests for Degree Plan changes must be approved by the student's advisory committee and submitted in writing by the major professor to the graduate dean.

A formal plan (Research Proposal) describing how the practicum is to be spent must be approved by the advisory committee and submitted (<https://www.unthsc.edu/graduate-school-of-biomedical-sciences/forms-and-guidelines/>).

Role of Advisory Committee Members

The student should be made to feel that he/she may come to this mentor for advice/mentoring as needed. The major professor serves as chair of the advisory committee and thus, is responsible for overseeing the professional development of the student and assisting the student to optimize the educational experience. It is also the major professor's responsibility to read the student's research/practicum proposal and practicum report before these are submitted to the entire advisory committee and provide feedback on these documents in a timely manner. The student will then use this feedback to revise the document in question before submitting it to the other members of the committee.

The major professor and advisory committee will determine the final letter grade for the internship practicum.

Expectations and Focus of the Internship Practicum

As part of the Practicum the student will work on an independent project to explore more fully a particular aspect or research study in the field of the specific program. This project will form the basis of the student's Internship Practicum Report. The Internship Practicum (BMSC 5697) for Medical Science Research Track will take place in UNTHSC or affiliated facilities. The student works under the daily guidance of the major professor, with additional advice from the advisory committee. **For all disciplines, practicum projects are unremunerated.**

Possible foci of the project for the students in the Anatomy Track might include:

- Curriculum development with the possibility of publication
- Audio-visual technical assistance and video editing
- Research on anatomical variation
- Research assistant for current PhD students
- Survey-based educational research requiring IRB approval

At the end of the program, it is expected that the student will possess greater depth of research knowledge and how to apply it as well as basic research skills translatable to a variety of fields.

The graduate will be well prepared for professional school, further graduate training (PhD), or an academic/other career requiring a Master's degree.

Timetable for the Internship Practicum

Any change in the Internship Practicum dates requires previous approval from Program Director and Graduate Advisor.

Summer Start:

Date	Task
April of Year 1	Application for the Medical Science Research Track; student must contact possible mentors and submit application form Students will be advised of a decision prior to the enrolment deadline for the Summer semester.
End of May, Year 1	Student contacts committee members and arranges a committee meeting to discuss practicum project.
Summer Semester Year 2	Student registers for six (6) SCH of BMSC 5998 independent research with the major professor to begin training and planning for the practicum project. Student meets with advisory committee to sign Designation of Committee Form, approve the Degree Plan, and discuss training.
End of Summer Semester	Major Professor enters Summer Semester Grade ("S" or "U")
Fall Semester Year 2	Student continues independent research, and may also take elective courses for a total of nine (9) SCH.
End of August, Year 2	Student presents a draft research proposal to major professor for review. Edited draft is sent to other committee members for review.
Early September, Year 2	Advisory committee meets to review/approve final research proposal. IRB application should be submitted, if applicable.
December Year 2	Research/Practicum Proposals completed and signed by all committee members and filed in the Graduate School
Spring Semester Year 2	Student registers for nine (9) SCH BMSC 5697 Internship Practicum. Student checks deadline and files for graduation (submit form "Intend to Graduate")

March Year 2	Student calls an advisory committee meeting early in March to review their proposed practicum report outline (or may meet with members individually). Student starts drafting actual Practicum Report while continuing project(s). Student and Committee set defense date.
Last Week March	Major professor reviews drafts of report. Other Committee Members review Practicum Report no later than two (2) weeks prior to scheduled defense. Student sets defense date and schedules room and technical services. The “Intent to Defend” form must be filed at least 1 month prior to defense date in the Graduate School.
Early April	Student focuses 100% on completion of Practicum Report, preparing presentation and practicing presentation with Major Professor.
Last 2 weeks of April	Student defense of Practicum Report. All members of Advisory Committee and Program Director MUST be in attendance
Immediately following defense	Students makes final edits to Internship Practicum Report and submits in the Graduate School. Major Professor files letter grade
First week May	Comply with last day to complete all requirements for confirmation of degree

Research Proposal Guidelines

The research proposal for the practicum project allows the student to specify the problem/activities that will be pursued during the year; to elaborate on the significance of the study to a particular profession; to review related literature; and outline the appropriate methodology employed in the study within a reasonable time-frame. The proposal serves as a “road map” for the activities to follow. The proposal must be finalized during the fall semester.

Internship Proposal and Final Internship Practicum Report

Research Proposal Guidelines for Internship Practicum Proposal can be found at
<https://www.unthsc.edu/graduate-school-of-biomedical-sciences/forms-and-guidelines/>

Guidelines for the Final Internship Practicum Report and Defense

The student must file an “Intent to Defend” form in the Graduate School no later than one month before the date of the oral defense. Each student must present his/her practicum work to the public in a formal lecture and then defend it in front of the Advisory Committee in private immediately after the public presentation. After submitting the practicum report to the Advisory Committee (at least 2

weeks prior to the defense), it is the student's responsibility to set up his/her oral defense. All members of the Committee must be in attendance. In addition, the student should reserve a room for the oral presentation and defense at least 1 month prior to the defense.

Following the final report presentation and defense, the major professor together with the other members of the committee will assign a Pass/Fail for BMSC 5697 based on guidelines outlined in the **MS Defense Scoring Rubric**. The student must submit the signed **Report of Final Comprehensive Examination (Defense)** form to the GSBS office. A copy of the approved final report must be submitted to the Graduate School before graduation in accordance with the Graduate School rules and time limits.

All forms and Guidelines for the Final Internship Practicum Report and Defense can be found at <https://www.unthsc.edu/graduate-school-of-biomedical-sciences/graduation-instructions-and-forms/>

TurnItIn

The Graduate School of Biomedical Sciences supports initiatives that foster students' academic progress. Specifically, the GSBS has launched efforts that facilitate mastery of program competencies, while ensuring academic integrity. UNTHSC has contracted with *TurnItIn.com* for plagiarism detection services. *TurnItIn* helps prevent plagiarism by comparing student papers to sources such as commercial databases of online journal articles and periodicals, other student submissions, and current or archived information on the Internet.

Students will be required to submit their Final Practicum Report/Thesis to *TurnItIn* to receive feedback on originality of student's work. To facilitate the submission process, the Office of Education will set up the required written assignments in *TurnItIn* which can be accessed through CANVAS (GSBS.SMP.2019). This allows students to submit written assignments and obtain originality reports. The course written assignment set up in *TurnItIn* will allow the Instructor to monitor submissions for all required assignments and view results. Students should go to course CANVAS webpage to submit assignments.

The Similarity/Originality score must be less than or equal to 15% (not including the Bibliography). The use of this tool is designed to be a formative process, allowing students to gain/improve experience in writing skills and proper referencing. An additional goal allows students to evaluate and synthesize concepts covered in the course that need to be reflected within the written paper. *TurnItIn* compares the content in the paper against text on the Internet, other student submissions, and commercial databases. An Originality Report for each student submission is generated showing any text that appears to be duplicated. The instructor can use this information to determine if the duplicated text is plagiarized. The instructor remains the arbiter of what constitutes plagiarism. Instructions on how to submit the report will be sent to all students.