Medical Scientist Training Program

Reference Manual

CONTENTS

DESCRIPTION, REQUIREMENTS, ELIGIBILITY

The goal of the MD/PhD Program is to develop an outstanding workforce of physician scientists able to identify important problems in human health and apply effective research approaches to enable their solution. The program combines curricular elements from the School of Medicine, the Graduate School of Biomedical Sciences, and specific MD/PhD courses and activities to train physician scientists.

To complete the MD/PhD training, students must fulfill the curriculum described below. They must successfully defend a thesis and complete all requirements for the School of Medicine, including USMLE Step One and Step Two.

Residents and non-residents of Massachusetts are eligible for admission to the joint MD/PhD Program through the Graduate School of Biomedical Sciences and the School of Medicine. Students must complete both the MD and PhD degree at the University of Massachusetts Medical School to be eligible for the benefits (tuition and fee waiver, stipend) of the program.

CURRICULUM

The curricular components of the MD/PhD degree are detailed below. These must be completed to be awarded the MD/PhD degree.

MD/PHD Specific Courses

MDP 740A - Developing Solutions To Research Problems A - FOM1

Course Goal: This course is designed to help students discern study design approaches appropriate to the area of inquiry, consider biological variability in study design, prospectively design, and select valid data collection instruments, prospectively identify appropriate statistical methodologies and alternative analytical approaches, identify data sharing and publication strategies, accurately communicate facts and interpret results, and fairly acknowledge specific contributions to research studies. As part of the course, students are expected to achieve a minimum competency in the programing language "R". These course activities will be conducted in a manner that enables the student's intellectual contribution to the University's academic and research functions.

Course Objectives:

- Review the elements of experimental design, tools, and standards.
- Provide an overview of quality procedures for biomedical research, including authentication procedures.
- Review reporting guidelines used for manuscript preparation
- Present a workflow that promotes transparency including detailed record keeping and data management.
- Demonstrate understanding of how to conduct reproducibility/replication studies and effectively communicate results
- Basic of downloading data and essential dataset manipulation
- Basics of descriptive visualizing data once cleaned
- Basics of most common statistical analyses
- Basics of visualization and graphing

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information: Contact course director for details
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is a requirement of this course

☒ Lecture/Discussion	☒ Presentations	☒ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☒ Written Assignments	☒ Other *Final project presentations*

Course Leadership

Course Director: Corvera, Silvia
Co-Course Director:
Course Administrator:
Course Director email: silvia.corvera@umassmed.edu
Co-Course Director email:
Course Administrator email:

MDP 740B - Developing Solutions To Research Problems B – FOM2

Course Goals: Facilitate application of standards and requirements for rigor and responsibility and research as applied to the student's potential thesis project. In coordination with identified Thesis advisor, the student will elaborate thoughts on questions/problem to be analyzed, approaches to hypothesis generation, strategy for hypothesis testing, and strategy for data storage, analysis, and reporting. These course activities will be conducted in a manner that enables the student's intellectual contribution to the University's academic and research functions.

Learning Objectives:

- Identify the question or problem that is the topic of the research
- To enumerate current hypotheses related to the research question
- To justify the need for further hypothesis generation
- To explain how specific hypotheses will be derived from hypothesis generating approach
- To define the timeline for hypothesis generation
- To describe specific assays to test specific hypothesis
- To describe and justify statistical tests that will be used
- To describe how reproducibility will be ensured
- To describe where and how data will be stored
- To describe anticipated timelines for reporting and publication

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information:
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is a requirement of this course

☐ Lecture/Discussion	☐ Presentations	☒ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☒ Written Assignments	☐ Other

Course Leadership

Course Director: Corvera, Silvia
Co-Course Director:
Course Administrator:

Course Director email: silvia.corvera@umassmed.edu
Co-Course Director email:
Course Administrator email:

MDP 740C - Developing Solutions To Research Problems C – CCE & AS Years Following Completion of PhD

Course Goals: The goal for the course is to continue to support MD/PhD student connection to research activities during their Core Clinical Experiences (CCE). This will allow the student to conduct research in a manner that enables their intellectual contribution to the University's academic and research functions. The second goal is to support students in preparing to apply to research intensive residency programs. These activities will involve a minimum of one hour per week over the course of the semester (15 hours total).

Learning Objectives:

- Propose an approach to investigate novel research questions arising from their clinical observations
- Continue interactions with Thesis lab to conclude potential in progress research publications
- In consultation with MD/PhD mentors, explore potential areas of specialization that will be compatible with long term research career goals
- In consultation with MD/PhD mentors and Thesis advisor, work on Personal Statement appropriate for application to residency programs

Curricular Expectations:

The student will develop a presentation appropriate for the requirement for the Capstone Scholarship Discovery Program.

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information:
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is not a requirement of this course

☐ Lecture/Discussion	☐ Presentations	☐ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☐ Written Assignments	☐ Other

Course Leadership

Course Director: Corvera, Silvia
Co-Course Director:
Course Administrator:

Course Director email: silvia.corvera@umassmed.edu
Co-Course Director email:
Course Administrator email:

MDP 741 - Introduction to Translational Medicine – All Full Time Research Years in GSBS

Course Goals: The MD/PhD program stresses the importance of maintaining clinical involvement during students' dissertation research. The first goal of this course is to allow students to maintain clinical skills in a variety of clinical settings. The second goal is to help students identify an appropriate specialty in which to pursue residency training. Sessions should reinforce clinical skills learned during the first two years of medical school, as well as during the first 16 weeks of Core Clinical Experiences (CCE).

Curricular Expectations: Students will engage in a minimum 15 hours of clinical experiences during each of the fall, spring, and summer terms. Students will also participate in the Physician Scientist Forum, which is held weekly on Monday evenings. Students will be evaluated by their designated Learning Community MD/PhD mentor at the end of each term.

Prior to the end of each term during their dissertation research, students will record their clinical hours in the OASIS system using a dedicated form that will include the date, time, term, preceptor, and number of hours.

Preceptors must have a faculty appointment at UMass Medical School, and clinical sessions must take place at a facility that is affiliated with UMass Medical School. The student's designated Learning Community MD/PhD mentor must approve the choice of preceptor

Prerequisites: Open only to MD/PhD Students in PhD Portion of Degree | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information: Please contact course director for details
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is not a requirement of this course

☐ Lecture/Discussion	☐ Presentations	☐ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☐ Written Assignments	☐ Other

Course Leadership

Course Director: Kay, Jonathan
Co-Course Director:
Course Administrator:

Course Director email: Jonathan.Kay@umassmemorial.org
Co-Course Director email:
Course Administrator email:

MDP 742 - MD/PhD HIPAA and OSHA Certification – All Full Time Research Years in GSBS (Fall Only)

Certification module of HIPPA and OSHA that students enrolled in the PhD portion of the program are required to maintain annually (within the first two weeks of GSBS Fall semester) each year. This is an online WebCt class which can be accessed by each MD/PhD student registered for this course in PSSA. The scores will be monitored by the MD/PhD program administrator during the student's PhD years.

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks: None
Recommended Textbooks: None

Class Meeting Information:
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is not a requirement of this course

☐ Lecture/Discussion	☐ Presentations	☐ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☐ Written Assignments	☒ Other *Online assessment module in BBL*

Course Leadership

Course Director: Michelson, Anne
Co-Course Director:
Course Administrator:

Course Director email: anne.michelson@umassmed.edu
Co-Course Director email:
Course Administrator email:

MDP 743 - Preparation for Thesis Research –
1st Thematic Section of CCE Following FOM2 (Summer)

Preparation of MD/PhD students to enter GSBS full time research in Fall term after completing 16 weeks of clinical clerkships from May through August prior to GSBS start. This includes meetings with the future PI, literature review and, when scheduling permits, attendance at lab meetings. For students who have not yet selected a PI, the requirements are to work with MD/PhD and GSBS leadership to target and meet with potential lab rotation mentors during the summer term.

Prerequisites: MDP740 | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information:
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is not a requirement of this course

☐ Lecture/Discussion	☐ Presentations	☐ Proposals	☐ Exams
☐ Participation	☐ Problem Sets	☐ Written Assignments	☐ Other

Course Leadership

Course Director: Corvera, Silvia
Co-Course Director:
Course Administrator:

Course Director email: silvia.corvera@umassmed.edu
Co-Course Director email:
Course Administrator email:

MDP 800 - MD/PhD Physician Scientist Forum – All Years

Course Goals:

- To foster skills that MD/PhD students need to be maximally competitive for research intensive residency programs.
- To guide MD/PhD students regarding postgraduate training opportunities through interactions with residents, fellows, and faculty.
- To highlight connections between basic and clinical science through the presentation and discussion of patient cases.
- To expose postgraduate trainees to research conducted by MD/PhD students and promote opportunities for potential collaboration.

Curricular Expectations: This seminar is offered weekly for 1.5 hours every Monday evening. It is organized by MD/PhD students, and participation is required of students in all years of the MD/PhD program who are not otherwise scheduled for clinical rotations.

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information: Please contact course director for details
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is a requirement of this course

☐ Lecture/Discussion	☒ Presentations	☐ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☐ Written Assignments	☐ Other

Course Leadership

Course Director: Kay, Jonathan
Co-Course Director:
Course Administrator:

Course Director email: jonathan.kay@umassmemorial.org
Co-Course Director email:
Course Administrator email:

MDP 990 – Graduate Research for Students Post-Dissertation (Continuing Registration) – MS3 & MS4

Goal: To continue to develop insights and output from Thesis research during the last clinical years.

Students will be automatically registered for this course by MD/PhD administration.

Course Offering

- These courses are offered Fall, Spring, and Summer

Prerequisites: Completion of all the PhD requirements in the Graduate School of Biomedical Sciences. | **Credits:** 0 |
Grading Type: Pass/Marginal Pass/Fail
Associated Program(s): MD/PhD
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No

Required Textbooks:
Recommended Textbooks:

Class Meeting Information:
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Additional notes:

Assessment Modalities (only those checked)
Attendance is not a requirement of this course

☐ Lecture/Discussion	☐ Presentations	☐ Proposals	☐ Exams
☐ Participation	☐ Problem Sets	☐ Written Assignments	☐ Other

Course Leadership

Course Director: Michelson, Anne
Co-Course Director:
Course Administrator:

Course Director email: anne.michelson@umassmed.edu
Co-Course Director email:
Course Administrator email:

BBS 601 - Professionalism and Research Conduct (PARC) – GSBS2 Fall

This is a required course for all third year Basic Sciences students and all MD/PhD students entering doctoral study but who are not on the CPHR track. The PARC course helps to center our students in areas that are foundational to success in research: responsible data management; management of intellectual property; the ethical use of research subjects; recognizing and resolving conflicts of interest, professionalism in peer review and publishing; engaging mentors; and career exploration and planning. The PARC course comprises faculty-led presentations and small group discussions with case studies and workshop material.

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Sciences Programs
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No
Required Textbooks: Macrina, Francis L. Scientific Integrity: Text and Cases in Responsible Conduct of Research. ASM, 2005. ISBN: 1-55581-318-6. TEXTBOOK IS PROVIDED
Class Meeting Information: Wednesdays 9-11 a.m.
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates

Assessment Modalities (only those checked)
Attendance is a requirement of this course

☒ Lecture/Discussion	☐ Presentations	☐ Proposals	☐ Exams
☐ Participation	☐ Problem Sets	☒ Written Assignments	☐ Other

Course Leadership

Course Director: Imbalzano, Anthony
Co-Course Director: Fuhrmann, Cynthia
Course Administrator: Parker, Irina

Course Director email: Anthony.Imbalzano@umassmed.edu
Co-Course Director email: Cynthia.Fuhrmann@umassmed.edu
Course Administrator email: Irina.Parker@umassmed.edu

BBS 602 - Preparation for Qualifying Exam – GSBS1

This course seeks to help prospective scientists in the biological and medical sciences communicate their work effectively, in writing, graphics and oral presentations. The course teaches how to prepare and write a grant proposal, how to present orally to scientific peers, and how to give and receive scientific feedback. Students will write, peer edit and present an early draft of a potential qualifying proposal to help them prepare for their QE.

Prerequisites: None | **Credits:** 2 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs
This course fulfills an advanced topic requirement for associated programs: ☐Yes ☒No
Recommended Textbooks: The visual display of quantitative informations 2nd ed. (2001). Cheshire, CT: Graphics Press. PROVIDED TO STUDENTS BY THE GSBS.
Greene, Anne E. Writing Science in Plain English. The University of Chicago Press, 2013. (ISBN 978-0226026374)
Class Meeting Information: 2-4 pm (Class will meet via Zoom on most Mondays from Sept. 13th-Dec 20th, typically for one hour). Contact course director for more details.
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates
Additional Information: Students will have a pre-assignment due a week before the first class.

Assessment Modalities (only those checked)
Attendance is a requirement of this course

☒ Lecture/Discussion	☒ Presentations	☒ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☒ Written Assignments	☐ Other

Course Leadership

Course Director: Zitzewitz, Jill
Course Director email: Jill.Zitzewitz@umassmed.edu
Co-Course Director: Bosco, Daryl and Kurt Yilmaz, Nese
Co-Course Director email: Daryl.Bosco@umassmed.edu and Nese.KurtYilmaz@umassmed.edu
Course Administrator: Stratton, Annette
Course Administrator email: annette.stratton.com

BBS 850 - Laboratory Rotation – Pre FOM1 & FOM1 (Summer)

Laboratory rotations are defined periods of research experience under the direction of a faculty member. They are intended to familiarize the student with concepts and techniques in several areas of research and to assist the student in evaluating research laboratories and projects that might be developed into a dissertation project. The student will participate in an ongoing research project; gain familiarity with concepts underlying the research; acquire a working knowledge of techniques used in the research; and write a report and present an oral summary of the results of the research.

Prerequisites: None | **Credits:** Variable | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs

BBS 860 - BBS Qualifying Exam – GSBS1, QE Year

Students are required to register for this course in the fall semester of the academic year in which they are to pass their Qualifying Examination.

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs

BBS 865 - BBS TRAC Meeting – All GSBS2+ Yrs

All graduate students are required to have at least one Thesis Research Advisory Committee (TRAC) meeting each academic year. After passing their Qualifying Examination and selection of their TRAC, students are required to register for this course each fall semester until their Dissertation Advisory Committee is formed

MDP Goals:

- To periodically review progress along thesis research project advised by content experts
- To provide guidance for establishing a thesis research project consistent with the MD/PhD Program goals

MDP Curricular Expectations:
Two Thesis Research Advisory Committee (TRAC) meeting each academic year as define by the Professionalism Benchmark Checklist

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs

BBS 870 - Prequalifying Research – GSBS1

This course is for students who have selected a program and thesis advisor but who have not yet passed the Qualifying Examination.

Prerequisites: None | **Credits:** 9 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs

BBS 900 - Thesis Research – GSBS2

Students register for Thesis Research fall term of year three of the program, after passing the Qualifying Exam.

MDP Students: Fall term of year four in the program

Prerequisites: None | **Credits:** 12 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs

BBS 990 - Graduate Research – GSBS3+

Students register for Graduate Research fall term of year four in the PhD Program and will continue to register each semester until they complete all remaining requirements.

MDP Students: Fall term of year five plus in the program until requirements are complete

Prerequisites: None | **Credits:** 0 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Basic Biomedical Science Programs

CTS 605A - Introduction to Clinical and Translational Research – Pre FOM1 or Summer between FOM1/FOM2

This course reviews basic principles of epidemiology, investigation of disease outbreaks and the application of various observational and experimental research designs and strategies to clinical, epidemiological and translational research. Didactic instruction, readings and problem sets (including lab-based analyses) are utilized to more fully understand epidemics and their causes, as well as various study designs, including cross-sectional studies, case-control studies, cohort designs and randomized clinical trials. Students also will learn how to design surveillance systems and develop and evaluate screening and diagnostic tests. Students are graded on in-class participation and two writing assignments (write-up of lab exercise and in-class student presentation). This is a full semester course with a total of 30 contact hours.

Prerequisites: None | **Credits:** 3 | **Grading Type:** Letter
Associated Program(s): Clinical & Population Health Research MS Clinical Investigation
Required Textbooks: E-textbook: Goodman M. Biostatistics for Clinical and Public Health Research. 1st edition. 2018. ISBN: 978-1-315-15566-1
E-textbook: Ken Rothman. Epidemiology: An Introduction. 2nd edition. 2012. ISBN 978-0-19-975455-7
Class Meeting Information: 7/6/2021-7/29/2021, Tuesdays and Thursdays, 9am to 5pm, Final exam on the last Friday of the month 9am-12pm.
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates
Additional notes: Auditing will not be permitted for this course in 2021.

Course Leadership

Course Director: Baek, Jonggyu
Co-Course Director: Lapane, Kate
Course Director email: Jonggyu.Baek@umassmed.edu
Co-Course Director email: kate.lapane@umassmed.edu

CTS 702 - Ethics for Clinical Research – BBS Students Fall GSBS3, CPHR Students GSBS1

This course uses a case-oriented approach to provide students and trainees with a basic knowledge of ethics that will prepare them to understand and address problems in the ethical conduct of research involving human subjects, and to understand and address scientific misconduct, including fraud, misrepresentation and conflict of interest. The course also addresses publication ethics, IRB regulations and UMass Medical School regulations. Students will also focus on how to design ethical research and evaluate treatment risk, placebo control, ethics of recruitment, dilemmas of informed consent, potential scientific contribution and issues for special populations and conducting research internationally.

Prerequisites: None | **Credits:** 2 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Clinical & Population Health Research MS Clinical Investigation MD/PhD
Required Textbooks: Hughes J (ed). European Textbook on Ethics in Research. Luxembourg: Publications Office of the European Union, 2010. ISBN 978-92-79-17543-5 (Free Online)
Recommended Textbooks: Institute of Medicine 2009. On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition. Washington, DC: The National Academies Press. https://doi.org/10.17226/12192. ISBN-13: 978-0-309-11970-2 (Free Online)
Class Meeting Information: Thursdays 2-4 p.m.
Class Meeting Location: Room numbers and/or zoom links will be provided prior to class start dates
Additional notes: Class attendance is required so that case discussion can occur. Students who miss a class are required to provide a 1-2 page summary of class content from readings, and PowerPoint slides.

Assessment Modalities (only those checked)
Attendance is a requirement of this course

☐ Lecture/Discussion	☒ Presentations	☐ Proposals	☐ Exams
☒ Participation	☐ Problem Sets	☒ Written Assignments	☐ Other

Course Leadership

Course Director: Dube, Catherine
Course Director email: Catherine.Dube@umassmed.edu
Course Administrator: Baron, Kelley
Course Administrator email: kelley.baron@umassmed.edu

CTS 850 - Research Assistantship – Pre FOM1, Summer between FOM1/FOM2, GSBS1

Research rotations are defined periods of research experience under the direction of a faculty member. They are intended to familiarize the student with the theory, background, concepts and techniques in several areas of research and to assist the student in evaluating projects and areas that might be developed into a dissertation project. The student will participate in an ongoing research project; gain familiarity with a field of study; acquire a working knowledge of techniques used in the research; and write a report and make an oral presentation on the results of their work.

Prerequisites: None | **Credits:** 4 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Clinical & Population Health Research

CTS 865 - CTS TRAC Meeting – GSBS3+ (Fall, Spring)

All graduate students are required to have a TRAC meeting each academic year in the Fall. After passing their Qualifying Exam in January of the second year, and the Thesis Proposal Defense in the Spring or Summer of second year, students are required to register for this course each Fall semester until their Dissertation Examination Committee is formed.

Prerequisites: None | **Credits:** 1 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Clinical & Population Health Research MS Clinical Investigation

CTS 870 - Pre-Thesis Research – GSBS2

This course is for students who have selected a program and thesis advisor but who have not yet passed their Qualifying Examination.

Prerequisites: None | **Credits:** Variable | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Clinical & Population Health Research MS Clinical Investigation

CTS 900 - Thesis Research – GSBS3

Students register for Thesis Research after passing a Qualifying Examination. They will take Thesis Research each semester until they have accumulated 90 credits.

Prerequisites: None | **Credits:** Variable | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Clinical & Population Health Research MS Clinical Investigation

CTS 990 - Graduate Research – GSBS3+

Students register for Graduate Research after completing the requisite number of credits to meet graduation requirements. They will take this course each semester until they complete all remaining requirements.

Prerequisites: None | **Credits:** 0 | **Grading Type:** Pass/Marginal Pass/Fail
Associated Program(s): Clinical & Population Health Research MS Clinical Investigation

RESPONSIBLE CONDUCT OF RESEARCH (RCR) REQUIREMENTS

RCR Curricular Expectations for BBS Students

During FOM1

- Read eBook "On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition"
  - Summarize and report on assigned chapter – MDP leadership will contact you regarding scheduling and assignment.
- Complete online CITI training modules Animals and/or Human Subjects

During GSBS year 2

- FALL ONLY – Self-register for BBS601: Professionalism and Research Conduct

During GSBS year 3

- CTS702: Ethics for Clinical Research
  - Contact CPHR Director for registration and scheduling

During GSBS year 3 or 4

- Draft an IRB application (if doing so for research) or work with someone who is drafting an IRB application to be familiar with the process
- Attend two IRB meetings during the academic year

D During year 7+ in MD/PhD Program

- Attend yearly Physician Scientist Forum sessions on Responsible Conduct of Research

RCR Curricular Expectations for CPHR Students

During FOM1

- Read eBook "On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition"
  - Summarize and report on assigned chapter – MDP leadership will contact you regarding scheduling and assignment.
- Complete online CITI training modules Animals and/or Human Subjects

During GSBS year 1

- CTS702: Ethics for Clinical Research
  - Contact CPHR Director for registration and scheduling

During GSBS year 3 or 4

- Draft an IRB application (if doing so for research) or work with someone who is drafting an IRB application to be familiar with the process
- Attend two IRB meetings during the academic year (http://www.umassmed.edu/ccts/irb/)

During year 7+ in MD/PhD Program

- Attend yearly Physician Scientist Forum sessions on Responsible Conduct of Research

THESIS DEFENSE & PUBLICATION REQUIREMENTS

Readiness for Thesis defense will be determined by the TRAC in consultation with the Thesis Advisor. A final TRAC meeting will be conducted to review potential structure of the Thesis, external examiner, and defense date. Please refer to the Professionalism Benchmark Checklist for required forms and associated links.

While the program does not have a specific requirement for publications, these are strongly encouraged as they will improve opportunities for future residency and fellowship training.

TRANSITIONS & THESIS ADVISOR SELECTION

Transition from School of Medicine to Full Time Thesis Research (GSBS)

- Students will initiate full time Thesis research after
    - Successfully passing USMLE Step One*
    - Completion of the first Thematic section of the CCE (Core Clinical Experience)*

*Any deviation from this sequence requires approval from GSBS and SOM leadership and will be contingent upon exceptional circumstances

Thesis Advisor Selection

Thesis Advisor selection is a critically important element of the MD/PhD Program.

- Students must have completed at least one 4-week rotation, and discussed specific expectations associated with the MD/PhD Program with the selected advisor.

  These include:
    - A plan for completion of Thesis work within 4 years
    - Allowance for fulfillment of clinical requirements during Thesis research

- Students, together with the selected Thesis advisor, will have completed and submitted all requirements for MDP740B and discussed them with MD/PhD Program Director and/or Associate Director.

Transition from full time Thesis research to School of Medicine

- Students planning **May** return need to notify Associate Dean of Student Affairs by **February 1** that thesis has been submitted, and date of planned defense
- Students planning **September** return need to notify Associate Dean of Student Affairs by **June 1** that thesis has been submitted, and date of planned defense
- Students planning **January** return need to notify Associate Dean of Student Affairs by **October 1** that thesis has been submitted, and date of planned defense

Please refer to the MD/PhD Professionalism Benchmarks Checklist for information and required documents.

QUALIFYING EXAM FORMAT

The QE is conducted in three parts which must be completed by May 1 of GSBS year 1

1. Specific aims meeting
2. Creation and submission of a written proposal
3. Oral examination

Specific guidelines may be found here

MD/PHD PROFESSIONALISM BENCHMARK CHECKLIST

In addition to research and clinical activities, physician scientists must attend to administrative responsibilities associated with the conduct of their profession. As part of their training, MD/PhD students must complete, in a timely and professional manner, several administrative responsibilities largely associated with reporting on training requirements. A Professionalism Benchmark Checklist was developed for two purposes. First, to provide students with clear guidelines on their administrative requirements. Second, to assist the program in evaluating student professionalism.

The Professionalism Benchmark Checklist contains all expectations, deadlines, links to forms, and instructions for reporting requirements throughout School of Medicine and Graduate School of Biomedical Science years of training. Please refer to the checklist here for further details.

MD/PHD MENTORSHIP & AFFILATED FACULTY

Mentorship

Each student entering the MD/PhD Program at UMass Medical School is assigned a to a Learning Community and longitudinal preceptors associated with that Learning Community. In addition, MD/PhD students are assigned an advisor who is associated with the Learning Community and remains with them for the entire program throughout both medical and graduate school. Their role is to advise and support the student during all phases of the program. Current advisors are listed here.

Students will be expected to meet with their MD/PhD advisor biannually to discuss the relevant elements of the Professionalism Benchmark Checklist.*

In addition, students entering full-time thesis research will have a primary Thesis Advisor who will be an experienced investigator with a record of recent publications. Under some circumstances, a secondary Thesis Advisor will be required (such asor example, when the primary Thesis Advisor is a junior faculty member with no record of recent publications).*

* Any deviation from these guidelines should be discussed with MD/PhD Program Director, or MD/PhD Program Associate Director.

Affiliated Faculty

Faculty affiliated with the MD/PhD Program are expected to provide guidance and mentorship to students as primary Thesis Advisors, members of TRAC committees, members of Qualifying Exam committees, or members of Thesis examination committees.

Current affiliated faculty can be found here.

MD/PHD PROGRAM FINANCIAL COMMITMENT

The MD/PhD Program pays for 8 semesters in Medical School during which a student must be in good standing and up to date with all their current requirements (i.e. no extending).

All or part of any semester completed in the School of Medicine is considered a whole term. For example, if a student takes one or two blocks of clinical skills sessions prior to starting clerkship rotations they are still enrolled in Medical School and the Program is billed for an entire term. If a course or clerkship is taking during any semester, or part of a semester, it is considered a full semester.

If at any time a student must repeat part or all of a course during FOM1 and FOM2 by extending the medical school academic program, they will need to complete the requirement while on a Leave of Absence. Any terms completed on an LOA from the MD/PHD Program and GSBS, which is also defined by the suspension of program benefits, will not count toward the 8 semesters.

Financial Support, Tuition Fees

Tuition is waived and fees are set forth in the general schedule. The Special Program Fees are deferred and forgiven in full with the successful completion of the MD and PhD degrees at UMass Medical School.

MD/PhD students are eligible for graduate student stipends and health insurance throughout the program.

- Stipend - https://www.umassmed.edu/gsbs/admissions/financial-support/
- Tuition & Fees - https://www.umassmed.edu/education/graduate-school-of-biomedical-sciences/finances/