Center for Clinical and Translational Science

Scholar Handbook

Goal:
Translating Science into High Quality Care

T0
Preclinical and Foundational Research
Informs research with humans

T1
Translation to Humans
Clinical interventions and their initial testing

T2
Translation to Clinical Settings
Inform evidence-based guidelines

T3
Translation to Practice
Implementation in real-world settings

T4
Translation to Populations
Population-based outcomes studies

https://cpce.research.chop.edu/research-methods-approaches/translational-research

Academic Year 2019-2020
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Mayo Clinic College of Medicine and Science

Strategic Statements of Education

Vision
The Mayo Clinic College of Medicine and Science (MCCMS) will transform health care for both patients and society through excellence in education, discovery, innovation, teamwork, and leadership.

Mission
To educate and inspire a diverse workforce of health care providers, physicians and scientists through excellence in medical education, research and clinical care; to alleviate human suffering by providing compassionate and culturally sensitive care; to enhance the biomedical sciences through discovery and innovation; and to advance the national health care system through population science and leadership.

Primary Value
The needs of the patient come first.

Core Values
Respect, Integrity, Compassion, Healing, Teamwork, Innovation, Excellence, Stewardship.

More detail about the Strategic Statements of Education can be found here: MCCMS Strategic Statements of Education
Mayo Clinic Education Operating Plan 2017-2020

In supporting Mayo Clinic’s Strategic Statements of Education, an enterprise-wide operating plan was created to emphasize people, processes, and outcomes as follows:

- **People:** Invest in Talent and Technology;
- **Processes:** Transform the Education and Practice, Achieve Operational Excellence, and Generate Ongoing Demand; and
- **Outcomes:** Deliver Highest-Value Care to be Most Trusted and Affordable and Achieve Mission-Advancing Financial Performance.
Education Shield Plan Priorities include **People**, **Learning**, **Acclaim**, **Technology**, and **Organization** (PLATO). More detail about the Mayo Clinic Education Operating Plan and PLATO Priorities can be found here: [The Mayo Effect](#).
Organization
MCCMS is comprised of five Schools:

- **The Mayo Clinic Alix School of Medicine** offers a 4-year medical education program leading to an M.D. degree and dual M.D.-Ph.D. degree in collaboration with Mayo Clinic Graduate School of Biomedical Sciences.

- **The Mayo Clinic Graduate School of Biomedical Sciences** offers advanced scientific training toward Ph.D., M.D.-Ph.D. and Master’s degrees in biomedical research. Also includes Summer Undergraduate Research Fellowships and post-baccalaureate programs.

- **The Mayo Clinic School of Graduate Medical Education** offers graduate medical education that fosters hands-on and comprehensive clinical training for residents and fellows. Trainees may seek training in clinical and translational research.

- **The Mayo Clinic School of Health Sciences** offers training opportunities to allied health professionals with the focus of workforce development.

- **The Mayo Clinic School of Continuous Professional Development** offers accredited continuing medical education and professional development to today’s life-long learning professionals.

Additional information about each of the schools can be found here: [MCCMS: About the Schools](#)

The most up-to-date Organizational Chart for MCCMS can be located here: [MCCMS Organizational Chart](#)
Mayo Clinic Graduate School of Biomedical Sciences

Mission
Mayo Clinic Graduate School of Biomedical Sciences’ (MCGSBS) prevailing mission is to train future leaders in biomedical research and education. Pursuant to this goal, we will:

- Recruit and enroll outstanding students;
- Utilize unique and available educational, research, and clinical practice resources at Mayo Clinic to foster the individual academic strengths of every student;
- Engage students in interactive learning and research experiences to enhance critical thinking, problem solving, and biomedical knowledge.

A fundamental goal of MCGSBS is to promote an academic environment that supports trainee and faculty development that facilitates biomedical innovation to meet unmet healthcare needs.
Organization
MCGSBS provides advanced scientific training toward certificate, master’s, Ph.D., and M.D.-Ph.D. degrees in biomedical research.

The graduate school offers several scientific tracks for scholars to pursue, including:

- Biochemistry and Molecular Biology (BMB),
- Biomedical Engineering and Physiology (BMEP),
- Clinical and Translational Science (CTSC),
- Immunology (IMM),
- Molecular Pharmacology and Experimental Therapeutics (MPET),
- Neuroscience (NSC), and
- Virology and Gene Therapy (VGT).

Additional programming housed within the graduate school includes the Summer Undergraduate Research Fellowship and post-baccalaureate programs.

The MCGSBS is one of five schools that compose the MCCMS; schools, faculty, and scholars must follow all College-wide policy and protocols.

The most up-to-date Organizational Chart for MCGSBS can be located here: MCGSBS Organizational Chart
Center for Clinical and Translational Science (CCaTS)

CCaTS Vision and Mission
Mayo Clinic's primary value is that the needs of the patient come first. This commitment to patients includes maintaining comprehensive and robust research programs that lead to improvements in patient care.

Awardees of National Institutes of Health (NIH) Clinical and Translational Science Awards (CTSA), including Mayo Clinic, are charged with developing the next generation of multidisciplinary researchers, as well as innovative research tools and technologies that can be used to synergize clinical and translational research at their institutions and inter-institutionally, while acting as a catalyst for the application of new knowledge and techniques to the front lines of patient care.

Additional information about the CCaTS Vision and Mission can be found here: Mayo Clinic CCaTS
CCaTS Structure
The CCaTS houses myriad programs and offices with the goal of advancing patient care through rapid and safe application of new discoveries and techniques to clinical care. Included in CCaTS are resources for the following:

- Education and Career Development
- Consultative Research Resources
- Funding Opportunities
- Community Engagement
- Interdisciplinary Collaboration
- Offices of Clinical Trials, Entrepreneurship, Research Subject Recruitment, and Translation to Practice.

Further information about each of these areas can be found at the CCaTS homepage: Center for Clinical and Translational Science (CCATS)
CCaTS Educational Program Overview

CCaTS Education Vision and Mission
Mayo Clinic is committed to advancing the science of medicine by training and mentoring the next generation of clinicians and scientists — the people who will lead the research and health care teams of tomorrow.

Clinical and translational science focuses on speeding the movement (translation) of scientific discoveries into effective, accessible medical treatments that improve health. Translation of biomedical discoveries depends on the availability of a highly skilled clinical research workforce.

CCaTS offers education and career development programs that span the career spectrum, including predoctoral and postdoctoral programs, courses for allied health staff, and more. Investigators who have completed CCaTS education programs make significant contributions to the understanding of health and wellness.

Organization
CCaTS educational organization chart is below; for the most up-to-date chart, which includes program directors, education coordinators and specialists, and operation managers’ contact information can be provided upon request through CCATSEducation@mayo.edu.
CCaTS Educational Programs

CCaTS houses several educational and career development opportunities, including certificate, master’s, predoctoral, and KL2 programming. High-level details of each offering can be found in the table below and at CCaTS: Education.

**Online Only**

<table>
<thead>
<tr>
<th>Program</th>
<th>Audience</th>
<th>Time Commitment</th>
<th>Department Cost</th>
<th>Expectations and Outcomes</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamentals of Clinical and Translational Science (FunCaTS) (Online)</td>
<td>Medical professionals, residents, fellows, physicians and scientists</td>
<td>• No graduate credits&lt;br&gt;• ~5 hours&lt;br&gt;• Self-paced learning</td>
<td>Free</td>
<td>• Desire a basic understanding of research language and processes&lt;br&gt;• Certificate of completion from Mayo Clinic CCaTS&lt;br&gt;• Expand knowledge in clinical and translational research</td>
<td>None; available internally and externally</td>
</tr>
<tr>
<td>Essentials of Clinical and Translational Science (ECaTS) Program (Online)</td>
<td>Any Mayo Clinic employee who desires to understand clinical and translational science, basic terminology and epidemiological concepts from a clinical perspective, and basic statistical methods used in a variety of discipline</td>
<td>• No graduate credit&lt;br&gt;• 30 hours&lt;br&gt;• 6-month time limit for completion&lt;br&gt;• Self-paced</td>
<td>$500</td>
<td>• Certificate of completion from Mayo Clinic CCaTS&lt;br&gt;• Aligns with ACGME Practice-Based Learning and Improvement competency (IV.A.5.b and IV.A.5.c)&lt;br&gt;• Content assessed on the USMLE Step 1 exam</td>
<td>None; available to all Mayo Clinic Employees</td>
</tr>
<tr>
<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
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<tr>
<td></td>
<td>clinical study designs</td>
<td>and self-directed learning</td>
<td></td>
<td>under the competency of Practice-based Learning and Improvement</td>
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</tbody>
</table>
# Predoctoral

<table>
<thead>
<tr>
<th>Program</th>
<th>Audience</th>
<th>Time Commitment</th>
<th>Department Cost</th>
<th>Expectations and Outcomes</th>
<th>Program Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ph.D. Program</strong></td>
<td>Predoctoral students and clinical or research fellows</td>
<td>• 42 credits</td>
<td>Guaranteed internal fellowship</td>
<td>• Ph.D. from Mayo Clinic Graduate School of Biomedical Sciences</td>
<td>Same as those of MCGSBS: All Ph.D. Program candidates must fulfill the following requirements for eligibility:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 4 years</td>
<td></td>
<td>• Conduct research</td>
<td>• <strong>Be a U.S. Citizen or Lawful Permanent Resident</strong></td>
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<td></td>
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<td></td>
<td>• Stipend, full tuition and a travel funds</td>
<td>• A baccalaureate degree, preferably in the biological or physical sciences, from an accredited institution. A cumulative GPA of 3.0 on a 4.0 scale is necessary. Certification of the degree is required.</td>
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<td></td>
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<td>• Mentored research experience</td>
<td>• <strong>Have completed the Graduate Record Examination (GRE)</strong>. General Test is required and scores should reflect strong academic ability.</td>
</tr>
<tr>
<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
<td>Program Prerequisites</td>
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</tr>
<tr>
<td>M.D.-Ph.D. Program</td>
<td>Predoctoral students</td>
<td>7-8 years</td>
<td>Guaranteed internal fellowship</td>
<td>• Ph.D. from Mayo Clinic Graduate School of Biomedical Sciences</td>
<td>Applicants must submit a copy of their GRE test report. The subject test is not required. The MCAT examination may be substituted for the GRE. Undergraduate coursework expectations: • Applicants are expected to have completed one year of coursework with demonstrated competence (B average or above) in biology, chemistry, physics and calculus. • Additional coursework in biochemistry, molecular biology, cell biology and physiology is encouraged. Note: The medical school is responsible for admissions; upon admission, scholars may...</td>
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<tr>
<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
<td>Program Prerequisites</td>
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<td></td>
<td>• Conduct research</td>
<td>elect to join the CTS track.</td>
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<td></td>
<td>• Stipend, full tuition and a travel funds</td>
<td>Undergraduate degree</td>
</tr>
<tr>
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<td></td>
<td>• Mentored research experience</td>
<td>• A bachelor's degree or Pharm D. degree, preferably in the biological or physical sciences, from an accredited college or university in the United States or Canada prior to matriculation for admissions consideration. Certification of the degree is required. A higher degree cannot be substituted for this requirement, and no exceptions are made.</td>
</tr>
<tr>
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<td></td>
<td>• Thesis</td>
<td>Medical College Admission Test (MCAT)</td>
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<td></td>
<td>• Applicants must have a current MCAT exam (within three years of matriculation). Applications are reviewed after the</td>
</tr>
</tbody>
</table>
All applicants must have these prerequisite courses completed by June 15 of the planned matriculation year:

- One year of biology and/or zoology (with one year of lab)
- One year of inorganic chemistry (with one year of lab)
- One year of organic chemistry (with one year of lab)
- One year of physics (with one year of lab)
- One biochemistry course
- One year of calculus

*Most recent MCAT scores have been received by the American Medical College Application Service (AMCAS).*
<table>
<thead>
<tr>
<th>Program</th>
<th>Audience</th>
<th>Time Commitment</th>
<th>Department Cost</th>
<th>Expectations and Outcomes</th>
<th>Program Prerequisites</th>
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</thead>
<tbody>
<tr>
<td>M.D.-M.S. Program</td>
<td>Mayo Clinic Alix School of Medicine and University of Puerto Rico medical students</td>
<td>1 year of coursework (other milestones completed throughout medical school)</td>
<td>Covered program fees, stipend and research expense funds</td>
<td>• Research proposal developed</td>
<td>• Current medical student in the Mayo Clinic Alix School of Medical or the University of Puerto Rico School of Medicine. Must be a student in good standing. M.D.-Ph.D. students are not eligible.</td>
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<td>• Covered program fees, stipend and research expenses fund</td>
<td>• U.S. citizen or lawful permanent resident. Permanent residents must have a U.S. Permanent Resident Card (form I-551) or other verification of their legal status as a permanent resident. Individuals on temporary or student visas are not eligible.</td>
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<td></td>
<td>• Mentored research experience</td>
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<td></td>
<td>• Thesis</td>
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<tr>
<td>University of Puerto Rico (UPR) Medical Student Research Awards</td>
<td>University of Puerto Rico medical students</td>
<td>2 months</td>
<td>Stipend and housing expenses</td>
<td>• Poster presentation</td>
<td>• Completing your first year of training at the UPR School of Medicine. You must be a student in good standing.</td>
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<td>• Fulfills University of Puerto Rico School of Medicine’s research</td>
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<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
<td>Program Prerequisites</td>
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<td>requirement</td>
<td>standing at the UPR School of Medicine and anticipate completing your first year of medical school before June 1. The research experience would take place the summer after your first year of medical school.</td>
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<td><strong>Postdoctoral</strong></td>
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<tr>
<td><strong>KL2 Mentored Career Development</strong></td>
<td>Early-career clinicians and scientists</td>
<td>3 years</td>
<td>75-100% protected time</td>
<td>Conduct clinical research</td>
<td>Be employed at Mayo Clinic. KL2 scholars must have a Mayo Clinic.</td>
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<tr>
<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
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<tr>
<td>Program</td>
<td>procedural specialties</td>
<td>50% protected time.</td>
<td>75-100% salary plus research and travel funds</td>
<td>Guidance from a senior investigator</td>
<td>Clinic appointment of Research Associate or higher and be eligible to apply as a primary investigator for independent National Institutes of Health (NIH) funding.</td>
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<td>Publications</td>
<td><strong>Have a doctoral degree in a discipline applicable to clinical research.</strong></td>
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<td>Submission of a grant application</td>
<td><strong>U.S. citizen or lawful permanent resident.</strong> Permanent residents must have a U.S. Permanent Resident Card (form I-551) or other verification of their legal status as a permanent resident. Individuals on temporary or student visas are not eligible.</td>
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<td><strong>Commit to 3 years in the program.</strong></td>
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<td><strong>Be pursuing a clinical and translational research project.</strong></td>
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<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
<td>Program Prerequisites</td>
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<tr>
<td>Postdoctoral Master’s Degree Program (Face-to-Face and Blended)</td>
<td>Mayo Clinic physicians, nurses, scientists, medical students, fellows, residents and other staff in doctoral programs</td>
<td>24 graduate credits (288 hours)</td>
<td>$12,000</td>
<td>Master’s degree from Mayo Clinic Graduate School of Biomedical Sciences</td>
<td>Have identified a mentor.</td>
</tr>
<tr>
<td></td>
<td>Plan to lead research teams</td>
<td>2 years</td>
<td></td>
<td>Thesis (2-3 manuscripts)</td>
<td>Not be the recipient of an R01 or P award.</td>
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<td>GPA of 3.0 or higher</td>
<td>Not have similar pending applications.</td>
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<td>Individualized Coursework</td>
<td>Be employed at Mayo Clinic. The appointment must be of sufficient length to allow the applicant to complete all requirements of the program.</td>
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<td>Mentored research experience</td>
<td><strong>Have or be pursuing a doctoral degree in a discipline applicable to clinical research (M.D., Ph.D., M.B.B.S., D.O., D.M.D., etc.).</strong></td>
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<td>Lead a research team</td>
<td><strong>Identify a mentor.</strong></td>
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<td><strong>Be pursuing a clinical and translational research project that will lead to improvements in human health.</strong></td>
</tr>
<tr>
<td>Program</td>
<td>Audience</td>
<td>Time Commitment</td>
<td>Department Cost</td>
<td>Expectations and Outcomes</td>
<td>Program Prerequisites</td>
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</tbody>
</table>
| Postdoctoral Certificate Program (Face-to-Face and Blended) | • Mayo Clinic physicians, nurses, scientists, fellows, residents and other staff in doctoral programs  
• Plan to participate in clinical trials and understand research processes | • 12 graduate credits (144 hours)  
• 1 year                          | $6,000                         | • Certificate from Mayo Clinic CCaTS  
• Individualized coursework  
• Mentored research experience  
• Manuscript submitted for publication  
• Participate on a research team | • Be employed at Mayo Clinic. The appointment must be of sufficient length to allow the applicant to complete all requirements of the program.  
• Have or be pursuing a doctoral degree in a discipline applicable to clinical research (M.D., Ph.D., M.B.B.S., D.O., D.M.D., etc.).  
• Identify a mentor.  
• Be pursuing a clinical and translational research project that will lead to improvements in human health. |
**Exams and milestones for each program**

**Coursework**
The MCGSBS course descriptions for all CCaTS courses, including electives, can be found here: [MCGSBS CTS Course Descriptions](#).

Course requirements vary by program and are based on expected scholar competencies at graduation. A summary of course requirements and curricular milestones can be found below.

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Credits</th>
<th>KL2 Minimum Required for Program</th>
<th>Certificate Required for Program</th>
<th>Prerequisite for Written Comprehensive Exam</th>
<th>Master’s Required for Graduation</th>
<th>Ph.D. Prerequisite for Written Qualifying Exam</th>
<th>Ph.D. Required for Graduation</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTSC 5010</td>
<td>Clinical Research Protocol Development</td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CTSC 5020</td>
<td>Regulatory Issues in Clinical Research</td>
<td>1</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CTSC 5080</td>
<td>What Researchers Need to Know about Eliminating Health Disparities</td>
<td>1</td>
<td>X</td>
<td></td>
<td></td>
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<td>X</td>
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<tr>
<td>CTSC 5300</td>
<td>Fundamentals of Epidemiology <strong>NEW</strong></td>
<td>1</td>
<td>X</td>
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<tr>
<td>CTSC 5370</td>
<td>Introduction to Epidemiology <strong>NEW</strong></td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>CTSC 5390</td>
<td>Advanced Applied Epidemiologic Methods</td>
<td>2</td>
<td>X</td>
<td>X</td>
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<tr>
<td>CTSC 5600</td>
<td>Statistics in Clinical Research (Stats I)</td>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CTSC 5601</td>
<td>Utilizing Statistics in Clinical Research</td>
<td>1</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Course Number</td>
<td>Course Name</td>
<td>Credits</td>
<td>Minimum Required for Program</td>
<td>Certificate</td>
<td>Prerequisite for Written Comprehensive Exam</td>
<td>Master's</td>
<td>Required for Graduation</td>
<td>Prerequisite for Written Qualifying Exam</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------</td>
<td>---------</td>
<td>------------------------------</td>
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<tr>
<td>CTSC 5610</td>
<td>Introductory Statistical Methods II (Stats II)</td>
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<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTSC 5720</td>
<td>Clinical Trials: Design and Conduct</td>
<td>1</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>CTSC 6110</td>
<td>CTS Works in Progress</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>CTSC 6120</td>
<td>Case Studies in Translation</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CTSC 6130</td>
<td>CTS Journal Club</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CORE 6050*</td>
<td>Critical Thinking and Scientific Writing</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>CORE 6100</td>
<td>Chemical Principles of Biological Systems</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
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<tr>
<td>CORE 6150</td>
<td>Genome Biology</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>CORE 6510</td>
<td>Mechanisms of Human Disease</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Workshop</td>
<td>Write Winning Grant Proposals</td>
<td>NC</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Workshop</td>
<td>Writing and Publishing High-Impact Research</td>
<td>NC</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Electives</td>
<td>From CTSC or MCGSBS</td>
<td></td>
<td></td>
<td></td>
<td>Number of Elective Credits: 6</td>
<td>Number of Elective Credits: 9</td>
<td></td>
<td>Number of Elective Credits:11</td>
</tr>
</tbody>
</table>

*Only for scholars matriculating July 2019 and after.
Exams and Milestones
Each CCaTS Program has its own set of milestones which scholars must complete in order to successfully progress through their program. A brief overview and comparison of program milestones can be found below, along with links to intranet sites with additional detail.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fundamentals of Clinical and Translational Science (FunCaTS) (Online)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Fundamentals of Clinical and Translational Science (FUNCaTS) Program</td>
</tr>
<tr>
<td>Essentials of Clinical and Translational Science (ECaTS) Program (Online)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Essentials of Clinical and Translational Science (ECaTS) Program</td>
</tr>
<tr>
<td>Mayo Clinic Medical Student Research Awards</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Medical Student Research Awards: Mayo Clinic School of Medicine Research Award</td>
</tr>
<tr>
<td>University of Puerto Rico Medical Student Research Awards</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Medical Student Research Awards: University of Puerto Rico School of Medicine Research Award</td>
</tr>
<tr>
<td>KL2 Mentored Career Development Program</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>KL2 Program Components</td>
</tr>
<tr>
<td>Postdoctoral Certificate Program (Classroom and Online)</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Postdoctoral Certificate Program Curriculum</td>
</tr>
<tr>
<td>Postdoctoral Master’s Degree Program (Classroom and Online)</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Postdoctoral Master’s Degree Program Milestones</td>
</tr>
<tr>
<td>M.D.-M.S.</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Adheres to Postdoctoral Master’s Degree Program Milestones</td>
</tr>
<tr>
<td>Predoctoral</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Ph.D. Program Academic Milestones</td>
</tr>
<tr>
<td>M.D.-Ph.D.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Adheres to Ph.D. Program Academic Milestones</td>
</tr>
</tbody>
</table>
Competencies required for scholars at graduation
While the level of mastery for scholars varies by program, the core competencies remain the same across the CCaTS programs. For a comprehensive list of competencies and sub competencies, please see CTSA Core Competencies.
KL2 MENTORED CAREER DEVELOPMENT PROGRAM

Information compiled from the KL2 Mentored Career Development Program Website:

The KL2 Mentored Career Development Program is a three-year research program funded by the National Institutes of Health (NIH) and CCaTS that guides trainees toward an independent clinical research career. Research scholars represent a variety of clinical and translational research disciplines.

The KL2 Program prepares future research leaders in clinical and translational science. Scholars have a personalized learning environment with protected research time. They conduct a multidisciplinary clinical research project under the guidance of a senior Mayo Clinic investigator.

The KL2 Program prepares scholars to submit a grant application for continued funding based on their research and complete graduate-level clinical and translational research course work. Scholars have the option to complete either a master's degree or certificate in Clinical and Translational Science.

PROGRAM REQUIREMENTS

The KL2 Mentored Career Development program is comprised of three components: research, didactic coursework, and mentoring.

Core Competencies

Information compiled from the KL2 Mentored Career Development Program Website:

Core competencies

The KL2 Program core competencies reflect an overarching and integrated set of skills that exceeds individual course objectives to encompass the knowledge and skills required to become a productive clinical and translational researcher.

As final confirmation that scholars have mastered these competencies, they must prepare and submit grant applications (independent K or R01 or equivalent) to peer-reviewed funding agencies. The research conducted as KL2 scholars provides the basis for these grant applications.

The NIH and CCaTS determined areas of focus for scholars are:

- Behavioral methods
- Biostatistical methods
- Competitive grant proposals
- Health disparities
- Hypothesis generation
- Informatics
- Knowledge within the chosen field of research
- Laboratory methods
• Multidisciplinary research team leadership
• Multidisciplinary research team membership
• Research ethics
• Research regulations
• Results reporting
• Teaching and mentoring
• Translating new knowledge to routine care
• Universal research methods

Research Component

Information compiled from the KL2 Mentored Career Development Program Website:

KL2 scholars participate in a structured, mentored clinical or translational research project. The project may relate to any stage of clinical translation. For instance, projects may include early-stage translation (applying discoveries generated during laboratory and preclinical research to the development of trials and studies in humans) and late-stage translation (enhancing the adoption of best practices in the community).

This research component forms the foundation of scholars' future career development by providing preliminary data and a publication record to support extramural grant applications.

As scholars progress through the KL2 Program, they present at the KL2 Scholar Forum, the CCaTS Scientific Review Committee and CCaTS Grand Rounds. Scholars are expected to prepare and submit two to three first-author journal articles.

For more information on the KL2 Program's research component, review the research requirements.
Didactic Component

*Information compiled from the KL2 Mentored Career Development Program Website:*

Once admitted to the KL2 Program, scholars meet with their mentoring teams and program leadership to develop individualized action plans and timelines for their career development plans.

Program requirements include the following five credits:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Course Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTSC 5300</td>
<td>Fundamentals of Epidemiology</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5600</td>
<td>Statistics in Clinical and Translational Research</td>
<td>2</td>
</tr>
<tr>
<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5080</td>
<td>What Researchers Need to Know About Eliminating Health Disparities</td>
<td>1</td>
</tr>
<tr>
<td>Workshop</td>
<td>Write Winning Grant Proposals (required noncredit workshop)</td>
<td>0</td>
</tr>
<tr>
<td>Workshop</td>
<td>Writing and Publishing High-Impact Research Manuscripts (required noncredit workshop)</td>
<td>0</td>
</tr>
</tbody>
</table>

Working with their mentors and CCaTS staff, scholars identify additional graduate-level clinical and translational research coursework that will enable them to achieve the core competencies as well as their own didactic goals.

Additional didactic opportunities include a postdoctoral master's degree or certificate in Clinical and Translational Science.

Read more about the Postdoctoral Master's Degree Program and Postdoctoral Certificate Program.

Minimum grade requirements

Note that it is expected that scholars will successfully complete these courses with a minimum 3.0 GPA.

Mentoring Component

*Information compiled from the KL2 Mentored Career Development Program Website:*

An important and unique aspect of the KL2 Mentored Career Development Program is its mentoring component. Applicants must identify a mentor — a Mayo Clinic faculty member — before applying to the program.

The mentor-mentee relationship forms the basis for growth as an independent clinical and translational investigator. Mentors play vital roles in fostering scholars' career development, such as by helping them identify and pursue relevant educational and training opportunities.

Read more about the KL2 Program's mentoring expectations.
Program Milestones

Information compiled from the For Current Scholars site:

While recognizing that each KL2 scholar has his, her, or their own individualized program and timeline, CCaTS tracks specific program milestones.

After acceptance to the KL2 Mentored Career Development Program, an orientation is scheduled for March or April with incoming scholars, their mentors and program leadership to provide information regarding milestones, requirements, timelines and expectations.

Milestone 1: Research proposal and career development plan

Submission of a detailed research proposal in PHS 398 format, Human Subjects Protections prior approval documents (if applicable) and career development plan is required by May 15 prior to the start of the funding year. Proposals should be submitted according to National Institutes of Health (NIH) guidelines for an R01 application.

The career development plan includes specific details about the scholar's career goals, mentoring and training. Details are discussed at the program orientation meeting.

Milestone 2: Annual NIH progress report and internal progress report

NIH progress report

This report is required by NIH. The scholar and his, her, or their mentors complete this form annually, and it is submitted to NIH by CCaTS.

Internal progress report

This report is required by CCaTS. CCaTS provides scholars with templates in the first year. For the remainder of the award years, scholars are sent their previous year's reports to add their achievements and progress.

CCaTS provides scholars with the NIH progress report and the internal progress report templates in early February, and the completed reports are due to the KL2 education specialist by March 15

Milestone 3: Annual review with CCaTS Education Resources

In the first year, each KL2 scholar meets with the CCaTS KL2 Leadership Committee to discuss program progress and goals for the next year, including publications and grant applications. This meeting takes place in the spring. Mentors are encouraged to attend.
Milestone 4: Didactics

Courses are required to ensure each scholar leaves our program with a set of core competencies. However, prior completions of the required courses are accepted. Specific coursework is detailed earlier in this section.

Milestone 5: Meetings, workshops and presentations

Meetings

- **Scholar Forum**

- **Grand Rounds.** [CCaTS Grand Rounds](#) are held on Fridays from noon to 1 p.m.

- **Translational Science Meeting.** Held every April in Washington, D.C., travel expenses are covered by the grant. KL2 Scholars are required to attend at least one meeting and participate by submitting an abstract and registering for the mock study section. Early registration is encouraged, as the mock study section fills quickly.

- **Other specialty meetings.** As identified by the scholars' mentors.

- **Write Winning Grant Proposals**

- **Writing and Publishing High-Impact Research Manuscripts**

Presentations

- **Scholar Forum: End of grant year 1.** During the first year of the appointment, new KL2 scholars present their progress to the current KL2 scholars.

- **CCaTS Scientific Review Committee: Middle of grant year 2.** During the second year of the appointment, KL2 scholars present their progress to CCaTS Scientific Review Board members. Mentors are encouraged to attend. After the presentation, scholars are provided with written feedback regarding their progress and plans for the next year.

- **CCaTS Grand Rounds: End of grant year 3.** During the final year in the KL2 Program, scholars present their research findings to date at [CCaTS Grand Rounds](#).

Milestone 6: Grant application submission

One marker of success in the KL2 Program is the ability to obtain extramural grant funding to support the scholar’s research career.
The CCaTS KL2 Program requires that each KL2 scholar prepare and submit a grant application to a peer-reviewed funding source by the end of year two of the KL2 Program. Grant applications to intramural funding opportunities also are encouraged during this time.

**Milestone 7: Outcomes reporting**

At the end of his, her, or their grant, each KL2 scholar completes an exit survey, mentorship survey, Clinical and Translational Research Appraisal Inventory post-program survey, and participates in an exit interview.

Upon completion of the KL2 Program, the scholar submits a current National Institutes of Health (NIH) biosketch that documents his, her, or their current publications, grant support, academic rank and other academic activities.

CCaTS requests that scholars respond to an annual tracking survey and provide an up-to-date curriculum vitae and a general update about professional achievements on a regular basis.

**Career Development Plan**

*Information compiled from the [For Current Scholars site]:*

Each scholar in the KL2 Mentored Career Development Program is required to submit a detailed career development plan after acceptance into the program. This plan is approved by the KL2 Program Committee and ensures that you obtain maximum benefit from the KL2 Program.

Career development plans are reviewed based on the Career Development Plan Review Criteria.

**Section 1: Overall career goals**

Provide a summary of your career goals and explain how the activities in sections two and three will help you achieve these goals. You may modify your summary from your KL2 application based on Scientific Review Board suggestions. Provide background information on what you have already accomplished and your anticipated career trajectory. Describe activities that address your short- and long-term objectives and provide a summary.

**Section 2: Mentoring component and mentoring team**

Identify the members of your mentoring and research team, their roles (for example, primary mentor, secondary mentor, co-investigator or consultant) and the disciplines they represent.

Describe your meeting plan, including frequency and duration. Also, complete the Individual Development Plan with your mentor.
Example:

<table>
<thead>
<tr>
<th>MENTOR NAME</th>
<th>ROLE</th>
<th>DISCIPLINE(S)</th>
<th>MEETING PLAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>John Smith, M.D.</td>
<td>Mentor</td>
<td>Cardiology, epidemiology</td>
<td>Every Tuesday for 1 hour</td>
</tr>
</tbody>
</table>

Section 3: Training and didactic component

Describe your current skills and training (such as Ph.D. training and fellowships). Describe additional skills, training and education you plan to complete to accomplish your goals.

List all internal and external training (courses, meetings and conferences) you plan to attend, including the program requirements found at Program Milestones.

Examples:

Courses

<table>
<thead>
<tr>
<th>COURSE NUMBER: NAME</th>
<th>QUARTER AND YEAR</th>
<th>OTHER DETAILS IF APPLICABLE (E.G., LOCATION, COST)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTSC 5080: What Researchers Need to Know About Eliminating Health Disparities</td>
<td>Fall 2019</td>
<td>Rochester</td>
</tr>
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</table>

Meetings and conferences

<table>
<thead>
<tr>
<th>MEETING OR CONFERENCE</th>
<th>DATE</th>
<th>LOCATION</th>
<th>PARTICIPATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Translational Science Meeting</td>
<td>April 2020</td>
<td>Washington, D.C.</td>
<td>Poster</td>
</tr>
</tbody>
</table>

Other items to include in section 3:

- **Write Winning Grants.** This one-day workshop addresses both the conceptual and practical aspects associated with the grant-writing process. It emphasizes idea development and how to write for reviewers. Included is a copy of the "Grant Application Writer's Workbook." [Read more](#).

- **Writing and Publishing High-Impact Research Manuscripts.** This one-day workshop addresses tips and strategies for successfully publishing original manuscripts in peer-reviewed biomedical journals. It includes a lecture component and interactive exercises. [Read more](#).
• **Budgeting.** Scholars attend budget meetings on a quarterly basis and as requested by the CCaTS program staff.

• **CCaTS Grand Rounds.** Held from noon to 1 p.m. each Friday, [CCaTS Grand Rounds](#) provides an opportunity for intellectual interaction among team members, students, trainees and faculty. It also provides a forum for scholars and students in the KL2 Program and Ph.D. Program to discuss projects and learn about the breadth of approaches and techniques used across the spectrum of clinical and translational science. Presenting at Grand Rounds is a requirement for all KL2 scholars in their final year of funding.

• **Required courses.** CTSC 5300, 5600, 5080 and CORE 6000. Review [course descriptions](#) for more information.

• **Scholars pursuing the master's degree or certificate.** In addition to the courses listed above, scholars pursuing the [Master's degree](#) or [Certificate](#) have additional required courses.
Career Development Plan Review Criteria

Information compiled from the For Current Scholars site:

Reviewers will critique your career development plan based on their personal experience and understanding of the goals of the KL2 Mentored Career Development Program. In addition to general critiques, they will provide specific suggestions for revisions based on these criteria.

- **Multidisciplinary characteristics.** Is there evidence of a multidisciplinary, team-based approach? Does the career plan incorporate elements of a multidisciplinary approach? Will the applicant gain experience in building the relationships necessary to assemble and lead a research team?

- **Environment.** Is the proposed environment, such as the mentors and facilities, appropriate for a clinical research training experience? Is there a clear plan for the mentors, including the frequency of meetings? Can these mentors provide the environment necessary to carry out the proposed research experience? Is the composition of the thesis committee appropriate?

- **Didactics.** Is the proposed didactic curriculum appropriate for the career goals of the scholar? Is it feasible? Are there other courses or experiences that the scholar should consider?

- **Research pre-proposal.** Is there an appropriate pre-proposal for a research practicum experience? Will the proposed project provide a good research training experience? Will it significantly add to the current scientific repertoire of the scholar? Could the project provide significant preliminary data and momentum for future extramural funding? Will it lead to research independence from the mentor? Is the proposed timeline feasible?

- **Overall assessment.** Overall, what are the strengths and weaknesses of the career development plan? What changes would you recommend?
Evaluation Process

Information compiled from the For Current Scholars site:

An outcome of primary importance to CCaTS is whether participation in the KL2 Program adequately prepares scholars to become successful clinical investigators.

Outcomes data tracked for each KL2 scholar includes academic positions, grants submitted and awarded, peer-reviewed publications published, patents received, and other traditional academic career accomplishments, such as recognition awards for teaching and research.

When you enter the KL2 Program as a scholar — and again each year — you are surveyed to assess your competencies and accomplishments. This progressive information is reviewed by you and your mentors during your annual meeting with the CCaTS KL2 Leadership and Scientific Review Committee.

Effective methods for maintaining email and paper communications are in place to regularly collect and record data on program trainees and career progression. These tracking tools are utilized to collect data — such as your research activities, productivity and academic achievements — in an effort to determine whether your career trajectory is truly progressing along the pathway toward research independence and leadership in clinical research.

After you graduate from the KL2 Program, you will continue to be surveyed annually regarding your career progression, grant funding and publication record; this information is needed to meet NIH reporting requirements.

Outcome data collected

The administrative data collection system for tracking the academic progress of the KL2 scholars includes a series of short-term instruments, which assess markers of program success on an ongoing basis. The quantitative components of this information are maintained in a relational database, which allows for immediate retrieval and analysis. Data includes:

- Assessment of successful recruitment of diverse scholars
- Scholars successfully matched with excellent multidisciplinary mentor teams
- Relationships between scholars and mentor teams
- Scholars developing interdisciplinary research plans
- Implementation and applicability of curriculum
- Scholars completing academic and curricular milestones in a timely fashion
- Success of scholars in an academic curriculum

Also tracked are intermediate- and long-term outcomes, including:

- Completion rate
- Successful completion of minority scholars
- Publications of scholars
• Diversity of scholars' research
• Success of scholars in obtaining R01 or (equivalent) grant funding
• Success of scholars in obtaining faculty positions at high-quality academic medical centers
• Success of scholars in becoming training mentors of the future
• Success of scholars in leading interdisciplinary teams
Mentoring Expectations

Information compiled from the For Current Scholars site:

An important element of the KL2 Mentored Career Development Program is the formative relationship established between you and your mentor.

This relationship forms the basis for your clinical research development, and your mentor is your primary source of formal and informal acculturation as a clinical investigator. Mentors also play a critical role in helping you identify and pursue appropriate education, training and other career development goals.

Initial agreement

As with any relationship, scholar-mentor relationships are not immune to conflicts. To assist KL2 scholars and mentors in defining expectations and minimizing miscommunications that can lead to conflicts, you and your mentor are required to complete and submit the Initial Mentoring Agreement — Expectations for the Mentoring Relationship form with your KL2 Program application.

This agreement is designed to assist you and your mentor in establishing expectations for your relationship and provoke discussion in areas critical for your development.

Detailed agreement

After you are accepted into the KL2 Program, you and your mentors will complete the Individual Development Plan (IDP) — Expectations for the Mentoring Relationship form. This agreement is to be reviewed and updated annually. You should submit the detailed agreement with your research proposal, and going forward should submit an updated agreement with each yearly progress report.

Mentoring resources

KL2 scholars complete a structured mentorship curriculum, "Mentor Training for Clinical and Translational Researchers," which introduces, reinforces and integrates principles of effective mentorship. Through a sequence of small-group sessions, KL2 scholars develop essential tools and skills to improve their effectiveness as mentors and maximize existing relationships with their own mentors.

Additional online resources and in-person workshops are available to Mayo Clinic staff and students to build interpersonal, professional and mentoring skills. Visit the Faculty Development page within the Office of Applied Scholarship and Education Science (must be logged in to the Mayo Clinic network) for more information.

Periodic mentoring-focused sessions of CCaTS Grand Rounds provide interactive training and assistance for both mentors and KL2 scholars.
The book "Adviser, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering" (National Academies Press, 1997) is available for all mentors. This book, a joint publication of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, provides practical advice on how to become a better mentor.

HR Connect offers more resources on general mentorship. Visit HR Connect (must be logged into the Mayo Clinic network) and search for "mentoring."
Research Proposal

Information compiled from the For Current Scholars site:

The KL2 Mentored Career Development Program is built upon a mentored clinical research experience. Prior to starting the program, you will work with your mentors and CCaTS staff to develop and refine your research proposal.

Your research proposal is due May 15 prior to beginning your program. It should address how your project relates to human disease and how it will advance knowledge in clinical research, using the definition set forth by NIH in the Public Health Service Grant (PHS 398) instructions (see page III-26).

Assemble your research proposal according to PHS 398 guidelines for an R01 application. Details are discussed at your orientation meeting. Your proposal should include:

- Project summary
- Table of contents
- Detailed protocol budget (for protocol only — do not list salary, mentor or travel expenses)
- Resources
- Continuation format page (proposal — 12-page limit. If applicable, highlight changes made from original proposal.)
- Targeted or planned enrollment report
- Inclusion of enrollment report
- All personnel report

Please note that a research proposal addresses significance, approach, innovation, investigator and environment, as well as the adequacy of the research with respect to inclusion of all sexes, genders, minorities and other special populations, as appropriate for the scientific goals of the research.

As participation in a variety of research projects is advantageous, you may also take part in ongoing research projects conducted by your mentors, as long as this contributes to your career development. This may be especially appropriate in the first year of your training as you develop your own research proposal.

Involvement in other research projects must not detract from the formulation or conduct of your own research projects or the successful completion of the didactic curriculum. This proposed experience should be a part of the initial application to the program and must be approved by the CCaTS KL2 Program Committee as part of the acceptance procedure.

Research proposal review process

Your proposal is reviewed by the CCaTS KL2 Program Committee and, if necessary, ad hoc reviewers to ensure expert review.
Proposals may require revision in accordance with CCaTS KL2 Program Committee comments before final approval is granted.

**Changes to approved research proposal**

If during the course of the research process you and your mentor determine that significant changes need to be made to the approved proposal, specify those changes in a letter addressed to the chair of the CCaTS KL2 Program Committee and submit to the KL2 education specialist.
ADMINISTRATIVE PROCESSES

Course Registration
Course registration is completed through Banner (online). The first time you register for courses a paper registration form will need to be filled out and returned to the registrar’s office via fax, and registration is completed online thereafter. Late registrations and withdrawals are to be completed on paper and submitted to CTSEducation@mayo.edu. For additional information and links to necessary documents, please see the MCGSBS of Biomedical Sciences intranet page.

Due to limited space in many CTSC courses, prioritization for enrollment for credit may be given to KL2, certificate-, or degree-seeking (master’s and predoctoral) scholars. Such prioritization is noted in the course listings on the CCaTS Education Website. If you have questions regarding eligibility for a course or placement on a waitlist as a result of such processes, please reach out to your CTS Curriculum Education Specialist for additional information.

As a general rule, auditors are not permitted in CTS course offerings. If you feel you have a reason for auditing a specific course and cannot enroll for credit, please contact the course directors directly.

Research Support
Information compiled from the Administrative Requirements site:

Mayo Clinic provides Business Objects, an online accounting software application, for tracking time and expenses within a research budget. During the first month in the KL2 Mentored Career Development Program, scholars attend a KL2 Scholar Forum to learn about budgets.

KL2 Program scholars have up to $25,000 each year to support their research. A budget is included in the research proposal and career development plan submissions prior to the July 1 start date for review and approval. Funds are available as of July 1 each year.

Each KL2 scholar receives a unique posting account unit (PAU) and activity number to track his, her, or their expenses (research activity). Scholars also meet with their finance team quarterly to review budgets.

Effort Certification
Information compiled from the Administrative Requirements site:

For effort certification purposes, it is the scholar’s responsibility to charge his, her, or their time to the unique PAU and activity number (effort activity). Scholars should note that activity numbers change each grant year.

Scholars are also responsible for certifying their percent effort every month, as certification is tracked to verify compliance to the grant. If effort certification falls below the approved 75 percent effort (50
percent for surgical specialties), the education specialist, program director or both contact the scholar and his, her, or their department administrator for corrective steps. Failure to maintain the 75 percent effort may result in removal of funding. Additionally, any effort which exceeds the amount approved at the time of appointment to the program is the responsibility of the department.

Scholars should keep both their research and clinical administrators informed about their responsibilities in the KL2 Program so that their efforts are correctly reflected. Scholars having difficulty maintaining the appropriate effort should contact KL2 Program leadership immediately to resolve any time concerns.

**Trip Guidelines**

*Information compiled from the Administrative Requirements site:*

KL2 Scholars' travel expenses are covered for two trips each grant year, up to $2,500 total. Attendance at the National KL2 Program in Washington, D.C. is required at least once during the funded period.

Review Mayo's trip policy (must be logged in to the Mayo Clinic network) for guidance on the use of trip days and research time for trips.

**Grant Citation**

*Information compiled from the Administrative Requirements site:*

The NIH requires that you cite the CTSA grant if you received training or funding through CCaTS — which all KL2 scholars do — or if you used any CCaTS services to support your research. CCaTS also relies on these citations as a critical performance measure when reporting productivity (publications) to NIH each year. Including appropriate citations is a key component to pursuing grant renewals and additional funding.

Scholars should note KL2 funding on their curriculum vitae and biosketches using the following citation format:

Mayo Clinic Center for Clinical and Translational Science, KL2 Mentored Career Development Award. Funded by National Center for Advancing Translational Sciences (KL2 TR002379).
POSTDOCTORAL CERTIFICATE PROGRAM

Information compiled from the Postdoctoral Certificate Program site:

The Postdoctoral Certificate Program in Clinical and Translational Science is designed for Mayo Clinic physicians, scientists and other staff members with doctoral degrees who want to pursue advanced clinical and translational research training.

Offered by the CCaTS in collaboration with MCGSBS, the one-year Postdoctoral Certificate Program includes individualized course work, a mentored research experience and the development of a manuscript submitted for publication.

Upon completion of the certificate program, you will be prepared to:

- Actively participate on a research team
- Form hypotheses
- Design studies
- Analyze and interpret data
- Conduct a clinical research protocol
- Communicate research findings
PROGRAM REQUIREMENTS

Required courses

Information compiled from the Postdoctoral Program Certificate site:

All coursework for the Postdoctoral Certificate Program is offered through MCGSBS. Of the 12 didactic credits needed to complete the program, six are required and six are elective. The required courses are offered twice a year, beginning summer quarter and winter quarter.

Scholars select the six elective credits based on their career goals and in consultation with their mentors. Elective credits may be chosen from MCGSBS courses related to clinical and translational science or from the full listing of MCGSBS courses.

The six required credits are fulfilled by taking these courses:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Course Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTSC 5300</td>
<td>Fundamentals of Epidemiology</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5600</td>
<td>Statistics in Clinical and Translational Research</td>
<td>2</td>
</tr>
<tr>
<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5010</td>
<td>Clinical Research Protocol Development</td>
<td>2</td>
</tr>
<tr>
<td>Workshop</td>
<td>Writing and Publishing High-Impact Research Manuscripts (required noncredit workshop)</td>
<td>0</td>
</tr>
</tbody>
</table>

Proposed course plan

Information compiled from the Postdoctoral Program Certificate site:

If the scholar is able to commit 100 percent of his, her, or their time to the Postdoctoral Certificate Program, it is possible to complete the 12 credits, the research project, and manuscript within one year. The program may take longer if less than 100 percent of the scholar's time is available.

Minimum grade requirements

Information compiled from the Postdoctoral Program Certificate site:

The Postdoctoral Certificate Program in Clinical and Translational Science requires a minimum of 12 MCGSBS didactic credits with a minimum GPA of 3.0 on a 4.0 scale, attendance at the Writing and
Publishing High-Impact Research Manuscripts workshop, and submission of a manuscript based on the results of your clinical and translational research project.

**Program Milestones**

*Information compiled from the [Postdoctoral Program Certificate Academic Milestones](#) site:*

The CCaTS Postdoctoral Programs Committee tracks your progress toward successfully completing the Postdoctoral Certificate Program. Please submit all required items to your CCaTS program education specialist.

**Milestone 1: Research proposal and supporting documents**

The deadline for your research proposal and supporting documents is based on your academic cycle listed below. Note that the proposal due date is based on completing the program within one year of beginning your coursework. Early proposals are always encouraged. Read more about research proposal and manuscript requirements.

<table>
<thead>
<tr>
<th>ENROLLMENT IN CTSC 5010: PROTOCOL DEVELOPMENT</th>
<th>PROPOSAL SUBMISSION</th>
<th>PROGRAM COMPLETION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall quarter</td>
<td>January 1</td>
<td>June</td>
</tr>
<tr>
<td>Spring quarter</td>
<td>July 1</td>
<td>December</td>
</tr>
</tbody>
</table>

**Note:** The [Certificate Program Progress Report](#) should be submitted three months after submitting your research proposal and every three-six months thereafter, based on demonstrated progress.

**Milestone 2: Writing and Publishing High-Impact Research Manuscripts workshop**

Scholars are required to attend the Writing and Publishing High-Impact Research Manuscripts workshop, which is offered once each year in March.

**Milestone 3: Didactic coursework**

The Postdoctoral Certificate Program requires 12 credits with a minimum cumulative GPA of 3.0 on a 4.0 scale. Read more about the certificate program’s [curriculum](#), including required and elective courses.

**Note:** Scholars admitted to the Postdoctoral Certificate Program are given priority for registration in CTSC classes. Non-admitted attendees are allowed to register on a space-available basis.
Milestone 4: Manuscript and supporting documents

The research you conduct as part of the Postdoctoral Certificate Program results in a manuscript submitted to a journal, and you are required to cite the CTSA grant in the "acknowledgements" section of your manuscript. Read more about final manuscript requirements.

Milestone 5: Program completion

Before your certificate is awarded, these items must be completed and submitted to CCaTS:

- All necessary coursework with a satisfactory GPA
- Your manuscript, including the journal submission number, mentor summary statement and current curriculum vitae
- A program evaluation questionnaire
Mentoring Expectations
Information compiled from the Postdoctoral Program Certificate Mentoring Expectations site:

An important element of the Postdoctoral Certificate Program in Clinical and Translational Science is the formative relationship established between you and your mentor.

This relationship forms the basis for your clinical research development, and your mentor is your primary source of formal and informal acculturation as a clinical investigator. Mentors also play a critical role in helping you identify and pursue appropriate education, training and other career development goals.

Mentoring agreement

As with any relationship, scholar-mentor relationships are not immune to conflicts. To assist you and your mentor in defining expectations and minimizing miscommunications that can lead to conflicts, you and your mentor are required to complete and submit the Initial Mentoring Agreement — Expectations for the CCaTS Scholar Mentoring Relationship form with your Postdoctoral Certificate Program application.

The agreement is designed to assist you and your mentor in establishing expectations for your relationship and provoke discussion in areas critical for your development.

Mentoring resources

- Periodic mentoring-focused sessions of CCaTS Grand Rounds provide interactive training and assistance for both you and your mentor.
- The book "Advisor, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering" (National Academy Press, 1997) is available to all mentors. This book, a joint publication of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, provides practical advice on how to become a better mentor.
- Individual Development Plan — Expectations for the CCaTS Scholar Mentoring Relationship form (PDF)
- A number of courses and seminars are available to Mayo Clinic staff and students to build interpersonal, professional and mentoring skills.
  - The Office of Applied Scholarship and Education Science intranet site (must be logged in to the Mayo Clinic network) offers free online tools and resources to assist you in preparing and developing your research mentoring relationships and skills.
  - HR Connect offers more resources on general mentorship. Visit HR Connect (must be logged into the Mayo Clinic network) and search for "mentoring."
Research Proposal Requirements

Information compiled from the Postdoctoral Program Certificate Research Proposal Requirements site:

Your research proposal will be developed in CTSC 5010: Clinical Research Protocol Development with a deadline based on the academic cycle listed below.

Early submission of your proposal is allowed. Your research proposal will then be reviewed by the CCaTS Postdoctoral Programs Committee for approval.

<table>
<thead>
<tr>
<th>ENROLLMENT IN CTSC 5010: PROTOCOL DEVELOPMENT</th>
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<td>Spring quarter</td>
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<td>December</td>
</tr>
</tbody>
</table>

Please include these items in your proposal packet:

1. Checklist
2. Research Proposal Packet Cover Page
3. The proposal. Use the format developed in CTSC 5010. Please note the proposal review criteria listed below when writing your proposal
4. Verification statement from your department or division. This must document that peer review of the proposal has taken place, as well as that the proposed work is scientifically sound and clinically meaningful. The minute excerpt from your department or division research committee or minute excerpt used for submission to the Mayo Clinic Institutional Review Board (IRB) may be used

Note: If your project is considered nontherapeutic and minimal risk (for example, a retrospective chart review), the IRB does not require divisional review and the CCaTS Minimal Risk Study form is used in lieu of department or division verification.

5. Notification from the IRB. This documents that IRB approval has been granted for your project.

Research proposal review criteria

Proposals are reviewed by the CCaTS Postdoctoral Programs Committee using these criteria:

- Clinical or translational research. Does the project meet the definition of clinical or translational research? If an animal model is being studied, has the scholar justified its significance to human disease?
- Scientific peer review. Is the hypothesis significant? Is the study design valid? Is the data collection and analysis plan consistent with the study goal? Is there statistical justification?
- IRB review. Has IRB approval for the project been obtained, or is it pending? If the scholar’s project is part of a larger project, has documentation been provided showing IRB approval for the larger project?
• **Authorship.** Will the scholar be the first author on publications resulting from this project? If the scholar's project is part of a larger, multi-author study, has the scholar explained how he or she will contribute to authorship? Will the project result in at least one publication?

• **Feasibility.** Is there sufficient funding for the project? Is there sufficient time to collect data and recruit participants? Does the project align with the scholar's research interests?

• **Recruitment plan.** Has a satisfactory subject recruitment plan, including a timeline, been provided?

• **Current status.** Has the status of the project been provided? (For example, "Fifty percent of the data is collected, with data collection expected to be complete in six months.")
Final Manuscript Requirements

Information compiled from the Postdoctoral Program Certificate Final Manuscript Requirements site:

Cite the grant

Because you received funding through CCaTS and may have used CCaTS services to support your research, the NIH requires you to cite the grant in your manuscript. Use the citation below or see Citing CCaTS in Publications for details.

“This publication (or project) was made possible by the CTSA Grant UL1 TR002377 from the National Center for Advancing Translational Sciences (NCATS), a component of the National Institutes of Health (NIH). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the National Institutes of Health.”

Submit your manuscript to a journal

Your manuscript should be submitted to a reputable, peer-reviewed, national journal. The submission number sent to you will be forwarded on to CCaTS.

After submitting your manuscript to a journal

Submit the following to your Postdoctoral Certificate Program education specialist:

- Manuscript (ensuring our grant has been cited appropriately)
- Mentor summary statement (an email from your mentor is acceptable) stating:
  - The research was conducted by you (the scholar) and is scientifically sound
  - The manuscript is accurate and clearly written
  - You (the scholar) are the primary author of the manuscript
  - All the journals that you are submitting to
- Journal name and submission number

Your manuscript is then reviewed by the CCaTS Postdoctoral Programs Committee for approval and program completion.
ADMINISTRATIVE PROCESSES

Course Registration
Course registration is completed through Banner (online). The first time you register for courses a paper registration form will need to be filled out and returned to the registrar’s office via fax, and registration is completed online thereafter. Late registrations and withdrawals are to be completed on paper and submitted to CTSCEducation@mayo.edu. For additional information and links to necessary documents, please see the MCGSBS intranet page.

Due to limited space in many CTSC courses, prioritization for enrollment for credit may be given to KL2, certificate-, or degree-seeking (master’s and predoctoral) scholars. Such prioritization is noted in the course listings on the CCaTS Education Website. If you have questions regarding eligibility for a course or placement on a waitlist as a result of such processes, please reach out to your CTS Curriculum Education Specialist for additional information.

As a general rule, auditors are not permitted in CTS course offerings. If you feel you have a reason for auditing a specific course and cannot enroll for credit, please contact the course directors directly.

Class attendance
Information compiled from the Postdoctoral Program Certificate Administrative Policies site:

Class attendance is required. Contact the faculty and/or teaching assistant in advance for absences.

Grant citations
Information compiled from the Postdoctoral Program Certificate Administrative Policies site:

The NIH that the CTSA be cited by authors who receive funding through the Center for Clinical and Translational Science (CCaTS) or who use any CCaTS services to support their research. As a Postdoctoral Certificate Program scholar, you are required to cite the grant.

Scholars should note KL2 funding on their curriculum vitae and biosketches using the following citation format:

“Mayo Clinic Center for Clinical and Translational Science, KL2 Mentored Career Development Award. Funded by National Center for Advancing Translational Sciences (KL2 TR002379).”

Read more about Citing CCaTS in Publications.

Minimum GPA
Information compiled from the Postdoctoral Program Certificate Administrative Policies site:
The minimum cumulative GPA required to complete the Postdoctoral Certificate Program is 3.0 on a 4.0 scale. Grades of "satisfactory" ("S") are not calculated in the GPA. At least half the credits taken must be graded using the A-F system.

**Release time**

*Information compiled from the Postdoctoral Program Certificate Administrative Policies site:*

When applying to the Postdoctoral Certificate Program, you must demonstrate adequate protected time from clinical responsibilities to complete your research project and course work in your application timeline.

**Time requirement**

*Information compiled from the Postdoctoral Program Certificate Administrative Policies site:*

All requirements for the Postdoctoral Certificate Program must be satisfied within three years of admission to the program or three months after leaving Mayo Clinic.

**Transfer or waive credits**

*Information compiled from the Postdoctoral Program Certificate Administrative Policies site:*

A total of three didactic credits may be transferred into the Postdoctoral Certificate Program. Please contact your education specialist for requests.

- **Required courses.** To substitute or waive required course credits, submit a transcript and syllabus to the education specialist. Requests will be reviewed by the course director with recommendation to the CCaTS Postdoctoral Executive Committee. You may also be requested to prove competence by taking an exam on the subject. The CCaTS Postdoctoral Executive Committee will approve or deny the request. If a course is waived, you are still required to complete 12 didactic credits.

- **Elective courses.** To substitute elective course credits, submit a transcript to the education specialist. The requested transfer credit must relate to the scholar project, with the grade received being a minimum of a B (not B-minus) and completed within five years. The CCaTS Postdoctoral Executive Committee will approve or deny the request.
POSTDOCTORAL MASTER'S AND M.D.-MS DEGREE PROGRAMS

Postdoctoral Master’s Program ([Excerpted from the Postdoctoral Master’s Degree Program site]): For Mayo Clinic physicians, scientists and other staff who have already earned doctoral degrees, CCaTS and MCGSBS collaborate to offer a master's degree in clinical and translational science.

The Postdoctoral Master's Degree Program, which is designed to be completed in about two years, includes course work and a mentored research experience, and culminates in a published thesis.

As every scholar has different career aspirations, this is an individualized program. Based on your clinical and translational research goals and interests, course work and other components of the program can be customized.

M.D.-M.S. Program ([Excerpted from the M.D.-MS Program site]): The M.D.-M.S. Program, through which medical students can earn a master's degree in clinical and translational science in addition to their medical degree, encourages students to broaden their knowledge of research and make it a part of their career and future practice.

All medical students enrolled in Mayo Clinic Alix School of Medicine or the University of Puerto Rico School of Medicine may take part in the M.D.-M.S. Program. Students in the program must dedicate one year to pursuing the master's degree between their second and third years of medical school.

Each year, the CCaTS offers a small number of students in the M.D.-M.S. Program an award that covers program fees while also providing a stipend and support for research expenses. All applicants are considered for this competitive award during the application review process.

To successfully complete the program, awardees must achieve the master's degree academic milestones. M.D.-M.S. students must complete all degree requirements by the end of medical school, though all coursework and the written comprehensive exam are required to be completed within the first year of the program.
PROGRAM REQUIREMENTS

Information compiled from the Postdoctoral Master’s Degree Program Curriculum site:

Scholars in the Postdoctoral Master's Degree Program in clinical and translational science are expected to gain competencies through carefully selected didactic coursework and a mentored research project. The degree requirements include:

- A minimum of 24 didactic credits
- A written comprehensive exam
- Two workshops
- Preparation and oral defense of a thesis

Core Competencies

Information compiled from the Postdoctoral Master’s Degree Program Curriculum site:

The CCaTS Education Resources Executive Committee has defined a set of core competencies that scholars are expected to acquire and refine during the master's degree program coursework and research.

The Postdoctoral Master’s Degree Program competencies reflect an overarching and integrated set of skills that goes beyond individual course objectives to represent the core knowledge and skills needed to become a productive clinical investigator. Upon successful completion of the program, scholars will be able to:

- Apply the appropriate study design
- Articulate the legal and ethical responsibilities of a clinical investigator
- Articulate the strengths and limitations of each study design
- Be prepared to write grant proposals that are judged successfully competitive
- Critically evaluate clinical research in the medical literature
- Design and conduct a clinical research project
- Devise feasible and testable hypotheses
- Effectively communicate research results through both manuscripts and presentations
- Understand the peer-review process and consider that process when preparing papers and grants
- Utilize appropriate biostatistical methods
Required courses

Information compiled from the Postdoctoral Master’s Degree Program Curriculum site:

All coursework for the Postdoctoral Master’s Degree Program is offered through MCGSBS. A minimum of 24 credits is required to complete the program — 15 are required and nine are elective.

Scholars select the nine elective credits based on recommendations from their mentors. Courses may be either clinical and translational science courses or MCGSBS. Visit MCGSBS Course Information for links to all courses.

The 15 required credits are fulfilled by taking these courses:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Course Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5010</td>
<td>Clinical Research Protocol Development</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5020</td>
<td>Regulatory Issues in Clinical Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5370</td>
<td>Introduction to Epidemiology</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5390</td>
<td>Advanced Applied Epidemiologic Methods</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5600</td>
<td>Statistics in Clinical and Translational Research</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5601</td>
<td>Utilizing Statistics in Clinical Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5610</td>
<td>Introductory Statistical Methods II</td>
<td>3</td>
</tr>
<tr>
<td>CTSC 5720</td>
<td>Clinical Trials: Design and Conduct</td>
<td>1</td>
</tr>
<tr>
<td>Workshop</td>
<td>Write Winning Grant Proposals (required noncredit workshop)</td>
<td>0</td>
</tr>
<tr>
<td>Workshop</td>
<td>Writing and Publishing High-Impact Research Manuscripts (required noncredit workshop)</td>
<td>0</td>
</tr>
</tbody>
</table>

Proposed course plan

Postdoctoral Master’s Degree Program (Excerpted from the Postdoctoral Master’s Degree Program Curriculum site): If the scholar is able to commit 100 percent of his, her, or their time to the Postdoctoral Master’s Degree Program, it is possible to complete the 24 credits and the thesis proposal in two years. The program will take longer if less than 100 percent of the scholar’s time is available to complete the coursework.
M.D.-M.S. Program ([Excerpted from the M.D.-M.S. Program site](#)): To successfully complete the program, awardees must achieve the master’s degree academic milestones. M.D.-M.S. students must complete all degree requirements by the end of medical school, though all coursework and the written comprehensive exam are required to be completed within the first year of the program.

**Minimum grade requirements**

*Information compiled from [Postdoctoral Master’s Degree Program Milestones](#) site:*

The Postdoctoral Master’s Degree Program requires the completion of 24 credits with a minimum cumulative GPA of 3.0 on a 4.0 scale.
Program Milestones

Information compiled from Postdoctoral Master’s Degree Program Milestones site:

While recognizing that each master's degree scholar has his, her, or their own individualized program and timeline, the CCaTS Postdoctoral Programs Committee tracks your progress toward successfully completing the Postdoctoral Master's Degree Program.

Please submit all required items electronically in one email to CCaTS EducProg@mayo.edu before the deadlines listed below.

Milestone 1: Research proposal packet

The submission deadline for your research proposal packet is based on your academic cycle listed below. However, you are encouraged to submit your proposal packet as early as possible. Review the research requirements page for details.

<table>
<thead>
<tr>
<th>APPLICATION DEADLINE</th>
<th>BEGIN COURSEWORK</th>
<th>PROPOSAL DUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 1</td>
<td>July 1</td>
<td>January 15</td>
</tr>
<tr>
<td>Sept. 1</td>
<td>January 1</td>
<td>July 15</td>
</tr>
</tbody>
</table>

Lack of adherence to deadlines may result in academic probation and dismissal from the program.

Milestone 2: Workshops

Scholars are required to attend the Write Winning Grant Proposals and Writing and Publishing High-Impact Research Manuscripts workshops. Both are offered once each year and included in your program fee.

Milestone 3: Progress meeting

Meet with your Master's Thesis Advisory Committee (TAC) three months after the approval of your research proposal and every six months thereafter.

Within one week of your meeting, submit a TAC progress report to the program education specialist. This detailed report includes progress made to date and outlines the projected timeline and expectations for the next meeting. Lack of submission of a progress report may result in academic probation.
Milestone 4: Completion of didactic coursework

The Postdoctoral Master’s Degree Program requires the completion of 24 credits with a minimum cumulative GPA of 3.0 on a 4.0 scale. Read more about the program’s curriculum, including required and elective courses.

You are encouraged to meet with the program education specialist early to discuss your plan of study and complete your degree program tool, located on the Postdoctoral Master's Degree Program Blackboard site, to ensure your coursework is completed within your schedule.

Milestone 5: Written Comprehensive Examination

Passing the Written Comprehensive Examination demonstrates your ability to integrate and synthesize the core competencies of the Postdoctoral Master's Degree Program.

Eligibility to sit for the Written Comprehensive Exam includes:

- Submission of the research proposal packet and approval by the Postdoctoral Programs Executive Committee
- Successful completion of the required courses with a minimum 3.0 GPA

Note: To defend your thesis, there is a waiting period of approximately eight weeks after taking the Written Comprehensive Exam.

Milestone 6: Submission and defense of thesis (Final Oral Examination)

Scheduling your thesis defense date may take three to six months to accommodate the schedules of your TAC members. Please plan accordingly. Review the Final Oral Examination section of the Thesis Requirements page for a timeline to schedule your defense. The thesis defense is a public forum in which you present your research and take questions from the audience. Therefore, you identify a forum to present to your peers and faculty.

After successfully defending your thesis, your TAC may request revisions to your thesis. Once your TAC approves thesis revisions, complete the following items to be cleared for graduation:

- Upload your final thesis to the ProQuest website. Additional information is found on the MCGSBS Thesis Guidelines document located on the MCGSBS Master’s Forms intranet page (must be logged in to the Mayo Clinic network).
- Submit the Thesis/Dissertation Publication Form.
Milestone 7: Graduation

Degrees are granted to Postdoctoral Master's Degree Program scholars four times each year in February, May, August and November.
Written Comprehensive Examination

Information compiled from Postdoctoral Master’s Degree Written Comprehensive Examination site:

The Written Comprehensive Examination, a requirement of the Postdoctoral Master's Degree Program, demonstrates your ability to integrate and synthesize the core competencies of the program.

You are eligible for the Written Comprehensive Examination after your research proposal packet has been submitted to and approved by the Postdoctoral Programs Executive Committee, and within six months of completion of the following courses with a minimum 3.0 GPA:

- CTSC 5010 — Clinical Research Protocol Development (spring, fall)
- CTSC 5370 — Introduction to Epidemiology (summer, winter)
- CTSC 5390 — Advanced Applied Epidemiological Methods (fall)
- CTSC 5600 — Statistics in Clinical and Translational Research (summer, winter)
- CTSC 5601 — Utilizing Statistics in Clinical Research (summer, spring)
- CTSC 5610 — Introductory Statistical Methods II (fall)

Note: Students are no longer required to complete CTSC 5720 — Clinical Trials: Design and Conduct before taking the Written Comprehensive Exam.

Scheduling your exam

The exam is typically offered the third Tuesday of January, April and September.

Registration is held each November for the following year, and is carried out with the program education specialist. Late registration is accepted up to six weeks before your proposed exam date.

Note: Exams are limited to 12 scholars a session. Plan accordingly and register early.

Once you are registered for your exam date, you will receive a confirmation email with the time and location of the exam. You will also be provided with the exam guidelines and a copy of a previous exam to review.

Exam details

The CCaTS Postdoctoral Programs Committee has approved these requirements for the Comprehensive Written Examination:

- The exam is administered in a location with a computer and printer available. Answers are completed according to a pre-specified template.

- The exam is administered on a computer. Use of books and notes are permitted. You are not permitted to search the internet or access electronic notes. Any class notes you want to use must be printed and brought with you. Please either leave your pager at home or turn it off.
iPhones, iPads, or any other type of smartphones and other computer devices are not allowed into the exam room.

- You have six hours to complete the exam, with three hours devoted to each of the two exercises:
  - One session involves reviewing a journal article according to the Journal of the American Medical Association's "Users' Guides to the Medical Literature."
  - One session involves a hypothetical clinical problem. You are asked to define the research question and outline a research design that addresses this question.

- Grade categories are "high pass," "pass" and "fail." Members of the CCaTS Written Comprehensive Examination Subcommittee review the exams and provide written evaluations.

- Exam results take up to eight weeks. The CCaTS education specialist will notify you and your mentor of your exam results.
  - If you receive a High pass or pass, you and your mentor will receive the Written Examination Report Form. The appropriate MCGSBS will be completed by CCaTS and forwarded to MCGSBS.
  - If you receive a marginal pass, a 30-minute oral exam will be scheduled within three to five days with several faculty members from the CCaTS Written Comprehensive Examination Subcommittee. The intent of this oral exam is to determine whether you have sufficiently mastered the core material, and it will not necessarily focus exclusively on the written examination. Your exam grade will be determined based on the written and oral exams and forwarded to MCGSBS. The exam chair will recommend the final grade to the CCaTS Postdoctoral Programs Committee for approval (in consultation with the committee if there is a disagreement among the reviewers).

- If you receive a failing grade on your exam (or the combined results of your written exam and subsequent oral exam, if applicable), the following applies:
  - You will meet with your mentor to develop a plan of remediation that addresses areas of deficiency and send your remediation plan to the education specialist.
  - You are required to retake the exam after the period of remediation, and it must be retaken within one year of the original exam date.

- The Written Comprehensive Examination may not be taken more than twice. In alignment with MCGSBS policy (must be logged in to the Mayo Clinic network), failing the exam twice results in dismissal from the Postdoctoral Master's Degree Program.
MENTORING EXPECTATIONS

An important element of the Postdoctoral Master's Degree Program in clinical and translational science is the formative relationship established between you and your mentor.

This relationship forms the basis for your clinical research development, and your mentor is your primary source of formal and informal acculturation as a clinical investigator. Mentors also play a critical role in helping you identify and pursue appropriate education, training and other career-development goals.

Mentoring agreement

As with any relationship, scholar-mentor relationships are not immune to conflicts. To assist you and your mentor in defining expectations and minimizing miscommunications that can lead to conflicts, you and your mentor are required to complete and submit the Initial Agreement — Expectations for the CCaTS Scholar Mentoring Relationship form with your Postdoctoral Master's Degree Program application.

The agreement is designed to assist you and your mentor in establishing expectations for your relationship and provoke discussion in areas critical for your development.

Mentoring resources

Periodic mentoring-focused sessions of CCaTS Grand Rounds provide interactive training and assistance for both you and your mentor.

All mentors are provided with the book "Advisor, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering" (National Academy Press, 1997). This book, a joint publication of the National Academy of Sciences, the National Academy of Engineering and the Institute of Medicine, provides practical advice on how to become a better mentor.

Additionally, a number of courses and seminars are available to Mayo Clinic staff and students to build interpersonal, professional and mentoring skills. Find mentoring modules in My Learning or HRConnect (must be logged in to the Mayo network) for more information.
Research Proposal

Information compiled from Postdoctoral Master’s Degree Research Proposal site:

The mentored research experience is a key component of the Postdoctoral Master's Degree Program in clinical and translational science.

Students develop their research proposals in CTSC 5010: Clinical Research Protocol Development with a deadline based on the academic cycle listed below. Members of the CCaTS Scientific Review Group review research proposals, and the Postdoctoral Programs Committee approves them. Early submission of proposals is encouraged.

BEGIN COURSEWORK | ENROLLMENT IN CTSC 5010: CLINICAL RESEARCH PROTOCOL DEVELOPMENT | PROPOSAL SUBMISSION
--- | --- | ---
Summer quarter | Fall quarter | January 15
Winter quarter | Spring quarter | July 15

Include these items in your proposal packet:

1. **Research Proposal Checklist**  Checklist must be signed by scholar and mentor

2. **Research Proposal Packet Cover Page**  (PDF)

3. **The proposal.** Research proposals are approved by the CCaTS Postdoctoral Programs Committee and MCGSBS. Follow the Research Proposal Guidelines and construct your specific aims in a way that clearly defines the two or three publications resulting from the proposal.

4. **Current curricula vitae for you and your mentor**

5. **Thesis Advisory Committee (TAC) form.** Complete the Master's Thesis Advisory Committee form. All TAC members are expected to provide scientific peer review and approve your proposal prior to submission. After your TAC has been approved by the Postdoctoral Executive Committee, the program staff will send you a link to the TAC e-form.

Read more about the Thesis Advisory Committee.

6. **Verification statement from your department or division.** This statement must document that peer review of the proposal has taken place and that the proposed work is scientifically sound and clinically meaningful. The minute excerpt from your department or division research committee or minute excerpt used for submission to the Mayo Clinic IRB may be used.

**Note:** If your project is deemed nontherapeutic and minimal risk (for example, a retrospective chart review), the IRB does not require divisional review and the CCaTS Minimal Risk Study form is used in lieu of department or division verification.
If the proposal is part of a larger project, submit the abstract and documentation of scientific peer review of the larger project (that is, the minute excerpt from the appropriate research committee or funding agency).

7. **IRB approval email notification.** This email notification documents that IRB review of your proposal was completed and approved. If the IRB has not yet approved your proposal, submit the email notification when approved. If your proposal is part of a larger project, please submit the IRB approval for the larger project.

**Research proposal review criteria**

The CCaTS Postdoctoral Programs Committee considers whether the thesis that will result from the proposal has the potential to meet the prescribed thesis standards and is feasible within the time frame identified. Proposals are reviewed by the CCaTS Postdoctoral Programs Committee using these criteria:

- **Clinical or translational research.** Does the project meet the definition of clinical or translational research? If an animal model is being studied, has the scholar justified its significance to human disease?
- **Scientific peer review.** Is the hypothesis significant? Is the study design valid? Is the data collection and analysis plan consistent with the study goal? Is there statistical justification?
- **IRB review.** Has IRB approval for the project been obtained, or is it pending? If the scholar’s project is part of a larger project, has documentation been provided showing IRB approval for the larger project?
- **Authorship.** Will the scholar be the first author on publications resulting from this project? If the scholar’s project is part of a larger, multiauthor study, has the scholar explained how he or she will contribute to authorship? Will the project result in at least one publication?
- **Feasibility.** Is there sufficient funding for the project? Is there sufficient time to collect data and recruit participants? Does the project align with the scholar’s research interests?
- **Recruitment plan.** Has a satisfactory subject recruitment plan, including a timeline, been provided?
- **Current status.** Has the status of the project been provided? (For example, "Fifty percent of the data is collected, with data collection expected to be complete in six months.")
Thesis Requirements

Information compiled from Postdoctoral Master’s Degree Thesis Requirements site:

The thesis is the most important document that you will prepare during your time in the master's degree program. It represents your approach to an original research question and serves as an archival record of the scientific accomplishments that justify the awarding of your degree. Ideally, the thesis could be used as a springboard to a subsequent grant application.

The thesis contains complete documentation of your approach to the research question, including:

- A comprehensive review of the literature related to your thesis topic
- A discussion of the significance and potential impact of your research question
- Methods and measures used to address that question
- Results
- A discussion of your results, taking into account their strengths and limitations, how they fit with and extend existing knowledge, and implications for future practice
- Next steps to be taken as a result of your research

When including published papers or manuscripts in your thesis, the status of the paper can be any of the following:

- Already published
- Submitted and accepted
- Submitted and in review
- Not yet submitted

Include an introductory page prior to each manuscript that provides:

- Title
- Authors
- Current publication status
- Copyright information (if applicable)
- A statement outlining the specific contributions of each author

Because you used CCaTS resources and services, including CTSC courses, the National Institutes of Health requires you to cite the CTSA grant.

MCGSBS has more information about thesis content and format. Review the MCGSBS Thesis Guidelines document located on the school's Master's Forms intranet page (must be logged in to the Mayo Clinic network).

Final thesis review process

- Mentor review. You must submit a final draft of your thesis to all your TAC members for review at least eight weeks prior to submitting it to the CCaTS Postdoctoral Programs Committee.
• **CCaTS Postdoctoral Programs Committee review.** Once your mentor approves your thesis, submit the items below to the CCaTS education specialist at least four weeks before your final oral defense is scheduled:

  o A summary statement from your mentor that includes:
    - An explanation of your role in design, conduct, analysis and reporting of your research
    - Verification that the research is scientifically sound, accurate and clearly written, was conducted by you, and you are the primary author of the thesis
    - A list of manuscripts or published articles included in the thesis

  o A signed summary letter from you that outlines any papers, presentations and grant applications that are planned, pending or have been submitted as a result of your thesis research.

    - Complete the [Verification Thesis is Ready to Defend form](#). After completion, this e-form will automatically be sent to your mentor and CCaTS. In order to obtain approval to proceed with your final thesis defense, you must submit the final draft of your thesis to your CCaTS education specialist and the bulleted items above at least three weeks prior to your anticipated defense date or your defense may need to be rescheduled.

The CCaTS Postdoctoral Programs Committee reserves the right to not accept a thesis if it does not meet program or MCGSBS standards and may request revisions or additions to the thesis. The committee must approve the thesis before the scholar proceeds to defend the thesis.

• **Distribution to your TAC.** After you receive approval from CCaTS, distribute your final thesis draft to all members of your TAC at least three weeks before your defense.
You are expected to pass your Final Oral Examination — a public forum in which you present your research and then take questions from the audience — before the completion of your degree program. The Final Oral Examination cannot be completed until the following criteria have been met:

- The Written Comprehensive Examination has been passed
- All courses on your degree program form have been completed with a GPA of 3.0 or higher
- All program milestones have been met and required workshops have been attended
- CCaTS has reviewed and approved your thesis

You are responsible for identifying a date, time and location for your Final Oral Examination. You will need to schedule the room and attendees for a minimum of two hours. All of your TAC members must attend either in person or be connected in real time via video or teleconference.

Due to the potential difficulty of scheduling your committee members, you are encouraged to schedule your date, time and location at least three to six months in advance.

**Please note:** Each absent member counts as one "fail" vote. To pass, you must have three passing votes.

After the public forum portion of your Final Oral Examination, your TAC will meet with you in a closed session for additional questions. You are then dismissed, and your TAC grades your examination.

The closed session is aimed at assessing the scholar’s understanding of the science and the methodological issues involved in the research. This may include questions on:

- Study design methodology
- Statistical methodology
- Implications of the results on clinical practice
- Future studies that could be designed
- Impact that this study has on the scholar’s future research career

If you fail the Final Oral Examination, your TAC will recommend a course of remedial studies to be completed prior to retaking the exam. The Final Oral Examination may be taken no more than twice and must be retaken within six months. Failing the exam twice will result in dismissal from the Postdoctoral Master’s Degree Program.

**Final thesis corrections**

After you pass the Final Oral Examination, you and your mentor must sign the Thesis/Dissertation Publication Form, indicating that any recommended corrections to your thesis have been made.
MCGSBS will not certify completion of your degree requirements until your final thesis has been uploaded to the ProQuest website. Additional information is found on page 19 of the MCGSBS Thesis Guidelines document, located on the school's Master's Forms intranet page (must be logged in to the Mayo Clinic network).
Thesis Advisory Committee (TAC)

Information compiled from Postdoctoral Master’s Degree Thesis Advisory Committee site:

The TAC oversees your research, thesis progress and final oral exam (thesis defense).

TAC composition

When developing your TAC, consider the following:

- Your mentor serves as committee chair.
- Identify three additional faculty members from at least two different clinical research disciplines.
- Identify one member with expertise in statistics, epidemiology or study design.
- It is desirable to have a member with basic science or translational laboratory expertise related to your project.

Additional TAC guidelines:

- Members may not be co-investigator or co-author for your research except your mentor and statistician/epidemiologist.
- All members, including ex-officio members, must have graduate faculty privileges in MCGSBS. In the MCGSBS General Forms/Resources page, see "MCGSBS Faculty Privileges" (must be logged in to the Mayo network) for an updated list of faculty with privileges. CCaTS will assist in nominating qualified members for faculty privileges if needed.
- The chair of the committee and at least one other member must have at least master’s-level graduate faculty privileges in MCGSBS.
- No more than two members may have Teaching/Examining graduate faculty privileges in MCGSBS.
- Current master's or certificate scholars may not serve on another scholar's committee.
- Ex-officio members are non-voting members, therefore, may be co-investigator or co-author for your research.

TAC responsibilities

You are expected to meet with your TAC three months after your proposal is approved and every six months thereafter (more often as needed) to review your research progress. Submit a detailed TAC progress report to the education specialist within one week following each meeting. This report summarizes the progress made to date and outlines the projected timeline and expectations for the next meeting. The Postdoctoral Executive Committee will review the progress report during its regular meetings.
Chair (your research mentor)

- Meets regularly with you (weekly meetings are strongly recommended)
- Guides you as you develop your proposal
- Critically reviews your proposal
- Chairs TAC progress meetings every six months — these meetings include all committee members, with the first meeting scheduled three months after your proposal is approved by the CCaTS Postdoctoral Programs Committee
- Reviews and approves TAC progress report after each TAC meeting
- Guides you with your thesis development
- Critically reviews your final thesis draft
- Prepares questions for your Final Oral Examination (see section below)

Members

- Critically review your proposal (using the proposal review criteria as a resource)
- Attend all TAC progress meetings
- Sign progress meeting report forms
- Critically review your final thesis draft
- Assist the TAC chair in preparing oral examination questions for your Final Oral Examination (see section below)

Note: Failure to attend progress meetings may result in loss of MCGSBsfaculty privileges in clinical and translational science.

Scholar (you)

- Anticipates and meets all due dates and deadlines
- Schedules TAC progress meetings three months after the approval of your proposal and every six months thereafter
- Submits detailed TAC progress report within one week of every meeting
- Submits your thesis draft to your TAC six to eight weeks before your Final Oral Examination, allowing sufficient time for reviewing as well as time for any recommended revisions or additions
- Submits your final thesis draft to CCaTS at least four weeks before your scheduled thesis defense date
Thesis Progress Meetings and Reports

Information compiled from Postdoctoral Master’s Degree Thesis Advisory Committee site:

Progress meetings enable you and your TAC to collectively monitor your research project, as well as informally evaluate your progress toward achieving the program’s core competencies.

Schedule your first TAC meeting three months after your proposal is approved by the CCaTS Postdoctoral Programs Committee. Follow-up meetings are scheduled every six months until completion of a successful Final Oral Examination. Have each member in attendance sign the progress report and update members who are not present.

Following each meeting, complete a progress meeting report form within one week of the meeting. The form can be signed via DocuSign if needed for those members not in attendance.

**Note:** Failure to hold progress meetings and submit progress reports may result in your being placed on academic probation or recommended for dismissal.
ADMINISTRATIVE PROCESSES

Course Registration
Course registration is completed through Banner (online). The first time you register for courses a paper registration form will need to be filled out and returned to the registrar’s office via fax, and registration is completed online thereafter. Late registrations and withdrawals are to be completed on paper and submitted to the CTS Curriculum Education Specialist for your respective program. For additional information and links to necessary documents, please see the MCGSBS intranet page.

Due to limited space in many CTSC courses, prioritization for enrollment for credit may be given to KL2, certificate-, or degree-seeking (master’s and predoctoral) scholars. Such prioritization is noted in the course listings on the CCaTS Education Website. If you have questions regarding eligibility for a course or placement on a waitlist as a result of such processes, please reach out to your CTS Curriculum Education Specialist for additional information.

As a general rule, auditors are not permitted in CTS course offerings. If you feel you have a reason for auditing a specific course and cannot enroll for credit, please contact the course directors directly.

Class Attendance
Information compiled from Postdoctoral Master’s Degree Thesis Administrative Policies site:

Class attendance is required. Arrangements for absences should be made in advance with the teaching assistant and faculty. Failure to notify your instructor of your absence may result in a failing grade or necessitate your withdrawal from the course before the last date to withdraw.

Grant and Mayo Clinic Graduate School of Biomedical Sciences citations
Excerpted from Postdoctoral Master’s Degree Thesis Administrative Policies site:

The National Institutes of Health (NIH) requires that the Clinical and Translational Science Award (CTSA) grant be cited by authors who receive funding through Mayo Clinic Center for Clinical and Translational Science (CCaTS) or who use any CCaTS services to support their research. As a Postdoctoral Master’s Degree Program scholar, you have received CCaTS support and must cite the grant.

CCaTS relies on these citations as a critical performance measure when reporting productivity (publications) to NIH each year. Read more about properly citing the grant.

You are also required to cite Mayo Clinic Graduate School of Biomedical Sciences.

Minimum GPA
Information compiled from Postdoctoral Master’s Degree Thesis Administrative Policies site:
The minimum cumulative GPA required to complete the Postdoctoral Master’s Degree Program is 3.0 on a 4.0 scale. Grades of "satisfactory" ("S") are not calculated in the GPA. At least half the credits taken must be graded using the A-F system.

**Time Requirement**
*Information compiled from Postdoctoral Master’s Degree Thesis Administrative Policies site:*

All requirements for the Postdoctoral Master's Degree Program **must be satisfied** before completion of your Mayo Clinic School of Graduate Medical Education residency or fellowship, or within five years of admission to the program if you are a Mayo staff member. From the date you defend your thesis, you have 30 days to submit all final paperwork and your final thesis to MCGSBS.

**Transfer Credits**
*Information compiled from Postdoctoral Master’s Degree Thesis Administrative Policies site:*

A total of six didactic credits may be transferred into the Postdoctoral Master's Degree Program. For more details, please see the Credit Transfer Policy on the MCGSBS Policies and Procedures intranet page (must be logged in to the Mayo Clinic network).

**Travel Requests**
*Postdoctoral Master’s Degree Program:* Postdoctoral Master’s scholars must follow their home department’s travel policy.

*M.D.-M.S. Program* (Excerpted from the CTSC Ph.D. Student Guide 2018-19): The maximum number of trip days allowed per appointment year for presentations is 18. Repeated presentation of the same material is discouraged.

One trip per year for **attendance-only** is allowed and must be funded through the student’s mentor. The maximum number of days absent is 5. Trip days will not be assessed for travel over weekends or holidays.

Students must make air travel reservations at least one month prior to the meeting dates. Airfare for trips involving presentation or attendance must follow Institutional policy. All travel arrangements must comply with Mayo Travel Policy regarding travel.

**Travel Procedures**
*Postdoctoral Master’s Degree Program:* Postdoctoral Master’s scholars must follow their home department’s travel policy.

*M.D.-M.S. Program* (Excerpted from the CTSC Ph.D. Student Guide 2018-19):
All trip requests, CTS & non-CTS funded, must first be approved by the CCaTS Predoctoral Programs Committee. Students must submit the following the CTS Predoc Travel Communication to the CTS Predoctoral Education Coordinator.

See Travel Procedures for CTS Students (Blackboard – CTS Ph.D. Program)

Trip requests must be made a minimum of two months in advance to allow for committee review. Trip requests will be discussed and approved or denied by the CCaTS Predoctoral Programs Committee. The CTS Ph.D. program requires an oral or poster presentation at the ACTS Annual Meeting at least once.

Vacation

Postdoctoral Master’s Degree Program: Postdoctoral Master’s scholars must follow their home department’s vacation/PTO policy.

M.D.-M.S. Program (Excerpted from the CTSC Ph.D. Student Guide 2018-19): Students are allowed 15 days of vacation per year beginning on the date of commencement of their appointment. Weekends and holidays are not charged as vacation time. Vacation cannot be carried over from one 12 month period to another. Approval to take vacation is obtained from the CTS Predoctoral Education Coordinator until an adviser has been identified. Because there is no "official" record kept of vacation usage, students will not be paid for unused vacation when they check out.

Supply Requests

Postdoctoral Master’s Degree Program: Postdoctoral Master’s scholars and their mentors are responsible for purchasing necessary supplies and services from their own PAUs.

M.D.-M.S. Program (Excerpted from the CTSC Ph.D. Student Guide 2018-19): Students will be given up to $2000 per academic year for the purchase of NIH-allowable supplies or expenses directly related to their coursework or research. In order to receive approval, please submit the CTS Predoc Request for Expense/Supplies Funding form to the CTS Education Coordinator for committee review and approval. Please allow at least 2 weeks for the approval process.
PREDOCTORAL AND M.D.-PH.D. PROGRAMS

Information compiled from the CTSC Ph.D. Student Guide 2018-19:

The CTS Ph.D. Program is built upon Mayo Clinic’s extensive interdisciplinary research and medical environment. It prepares graduates to lead the biomedical research teams of the future that will rapidly translate discovery to new treatments and change the paradigms of how we conduct biomedical research. From the didactic coursework, students acquire a broad perspective on the process of taking health questions from patients or the community into the research environment, designing and executing interdisciplinary research studies and translating the resulting discoveries into better health outcomes. Graduates of this program will be able to conduct research leading to meaningful scientific contributions. In addition, they will be prepared to change and improve how biomedical research is conceptualized and implemented.
COURSE REQUIREMENTS

Information compiled from the CTSC Ph.D. Student Guide 2018-19:

The CTSC track offers options for graduate study that can be designed to emphasize one of three focus areas: **population-based, patient-based or laboratory-based translational science**. Forty-two credits are required for graduation. In addition to the core, CTS specific and rotation requirements, advanced courses will be selected from either CTS courses or graduate school courses in the basic science disciplines depending on the scholar’s area of focus (population, patient, or lab-based translation). It is encouraged that the student consults with the CTS Predoctoral Program Director, CTS Predoctoral Education Coordinator or their Mentor to develop their Degree Program Form prior to registering for courses each quarter.

Note that scholars are held to the course and degree program requirements included in the MCGSBS science course catalog issued during their first year as a scholar in the program (i.e., if a scholar begins in 2019, their requirements for the whole program are those detailed in the 2019-2020 Academic Year MCGSBS Course Catalog). Any changes that occur in requirements after the first year are not applicable to scholars already in the program.
CTS Ph.D. Timeline
Excerpted from the CTSC Ph.D. Student Guide 2018-19:

1st Year – on Plummer 3
- Summer Qtr - Lab Rotation
- Fall Qtr - Lab Rotation
- Winter Qtr - Lab Rotation
  - March 31 – Mentor Selection Form Due
- Spring Qtr - Mentor Chosen & Pre-TAC formed

2nd Year – in Mentor’s Lab
- Summer Qtr - TAC approved
- Winter Qtr
- Spring Qtr - WQE passed

3rd Year
- Summer Qtr - OQE passed
- Winter Qtr - 1st Progress Report

4th – 5th Year – TAC Progress reports at least every 6 months

Throughout Program
- Degree Planning Tool (DPT) filled in and updated throughout.
- ACTS National meeting (required during first year and recommended at least once thereafter)
- Journal Club (by beginning of 3rd year)
- Works In Progress (by end of 4th year)
Laboratory Rotations

*Information adapted from the [CTSC Ph.D. Student Guide 2018-19](#)*

All students in the CTS Ph.D. program are required to complete three 8-week research/laboratory rotations. These are normally completed within the first nine months of study. The purpose of these rotations is to familiarize the student with research activities in their area of interest and to allow the student to make an informed decision in choosing a thesis advisor. The first lab rotation will be chosen with input from the CTS Predoctoral Program Director while the remaining two rotations are chosen by the student. Students are allowed to rotate only once in any given lab. For a list of mentors actively recruiting students, please visit the MCGSBS [Find a Mentor Tool](#).

CTS Ph.D. Students are asked to complete a minimum of one rotation in two of the three following areas: **laboratory-based translational research** (wet bench); **patient-based translational research** (human studies); and **population-based translational research** (epidemiology, statistics, health outcomes). Classification of rotations into each of these categories may be done on a case-by-case basis dependent upon the rotation project.

Research/laboratory rotations must be completed with Mayo faculty holding **Full Faculty Privileges** in any track in MCGSBS. Students interested in completing rotations with faculty who do not hold this level of privileges can request a review of the faculty member’s qualifications. This request must be submitted in writing to the CTS Predoctoral Education Coordinator at least **one month** prior to the requested rotation commencement.

Students interested in completing research/laboratory rotations at Mayo Clinic Florida or Mayo Clinic Arizona, must submit the request in writing to MCGSBS **three months** prior to the commencement of the rotation.

**Selection of a thesis mentor must be completed by March 31 of the student’s first academic year.** If a student is uncertain as to the direction of their thesis work following the completion of their third rotation, they can choose to complete up to two more rotations in order to seek further clarification; note that the student will not receive credit for doing so. However, like the previous three rotations, labs may not be duplicated. Following mentor selection, students will continue their research by enrolling in CTSC 6890 every quarter through thesis defense.
**Required Courses**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

All Ph.D. students in CTS have a common core curriculum:

<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Name</th>
<th>Course Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGS 5102</td>
<td>Lab Rotations (8 weeks, 2/rotation x 3)</td>
<td>6</td>
</tr>
<tr>
<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
<td>1</td>
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<tr>
<td>CORE 6050</td>
<td>Critical Thinking and Scientific Writing*</td>
<td>2</td>
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<tr>
<td>CORE 6100</td>
<td>Chemical Principles of Biological Systems</td>
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<tr>
<td>CORE 6150</td>
<td>Genome Biology</td>
<td>3</td>
</tr>
<tr>
<td>CORE 6510</td>
<td>Mechanisms of Human Disease</td>
<td>3</td>
</tr>
<tr>
<td>CTSC 5010</td>
<td>Clinical Research Protocol Development</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5020</td>
<td>Regulatory Issues in Clinical Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5370</td>
<td>Introduction to Epidemiology</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5600</td>
<td>Statistics in Clinical and Translational Research</td>
<td>2</td>
</tr>
<tr>
<td>CTSC 5601</td>
<td>Utilizing Statistics in Clinical Research</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 5720</td>
<td>Clinical Trials: Design and Conduct</td>
<td>1</td>
</tr>
<tr>
<td>CTSC 6120</td>
<td>Case Studies in Translation</td>
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</tr>
<tr>
<td>CTSC 6110</td>
<td>Works in Progress**</td>
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<tr>
<td>CTSC 6130</td>
<td>Journal Club**</td>
<td>1</td>
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<tr>
<td>Workshop</td>
<td>Write Winning Grant Proposals (required noncredit workshop)</td>
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</tr>
<tr>
<td>Workshop</td>
<td>Writing and Publishing High-Impact Research Manuscripts (required noncredit workshop)</td>
<td>0</td>
</tr>
</tbody>
</table>

*For those matriculating July 2019 and after.

**All students, regardless of year, must regularly attend CTSC 6110 Works in Progress and CTSC 6130 Journal Club. Students must register for CTSC 6110 and 6130 during the quarter in which they present to receive credit for the courses.
Advanced & Elective Courses

Excerpted from the CTSC Ph.D. Student Guide 2018-19:

Forty-two credits are required for graduation. In addition to the core, track, and rotation requirements, advanced and elective courses should be selected after consultation between the student, the CTS Predoctoral Program Director, and the student’s thesis advisor. Depending on the student’s area of concentration (population, patient or laboratory-based translational science) additional advanced courses will be selected from either CTS track courses or graduate school courses in the basic science disciplines.
### CTS Ph.D. Proposed Course Plan (Years 1 & 2)

*Information compiled from the [CTSC Ph.D. Student Guide 2018-19](#):*

<table>
<thead>
<tr>
<th>Course Quarter</th>
<th>Course Code</th>
<th>Title</th>
<th>Dates</th>
<th>Credits</th>
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<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
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<td>CORE 6150</td>
<td>Genome Biology</td>
<td>3</td>
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<td></td>
<td>CTSC 5600</td>
<td>Statistics in Clinical and Translational Research</td>
<td>2</td>
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<tr>
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<td>CTSC 5601</td>
<td>Utilizing Statistics</td>
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<td></td>
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<td></td>
<td>MGS 5102</td>
<td>8-week Lab Rotation</td>
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<td><strong>Fall Quarter 1</strong></td>
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<td>CORE 6100</td>
<td>Chemical Principles of Biological Systems</td>
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<td></td>
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<tr>
<td></td>
<td>CTSC 5020</td>
<td>Regulatory Issues in Clinical Research</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MGS 5102</td>
<td>8-week Lab Rotation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Winter Quarter 1</strong></td>
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<td></td>
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<tr>
<td></td>
<td>CTSC 5370</td>
<td>Introduction to Epidemiology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CTSC 5720</td>
<td>Clinical Trials</td>
<td>1</td>
<td></td>
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<td>CTSC 6120</td>
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<td>MGS 5102</td>
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<td>Core Selection Form (MSF)</td>
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<td>CTSC 6890</td>
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<td><strong>Total Credits</strong></td>
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<td></td>
<td></td>
<td>42</td>
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</tbody>
</table>
*For those matriculating July 2019 and after.

**Minimum Grade Requirements**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

Students are expected to obtain mastery in CTS core courses.

The MSGSBS requires students to maintain a grade point average of 3.0 in didactic course work in order to remain in good standing. Students whose performance falls below this standard in a given quarter will be placed on academic probation, as described in the Guidelines for Warning, Probation, Dismissal & Appeal outlined on the Mayo intranet at [http://mayocontent.mayo.edu/collegeofmedicine/DOCMAN-0000140215](http://mayocontent.mayo.edu/collegeofmedicine/DOCMAN-0000140215).

All students’ progress is routinely reviewed by program leadership each quarter. If a student’s grade point average is below 3.25, the student will be contacted by the Predoctoral Program Committee for review.

**Full-time Enrollment**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

All students enrolled in the Ph.D. program are full-time students. Full-time enrollment each quarter may include any combination of course work, laboratory rotations or research. **Students who have completed all course work and are engaged in full-time thesis research must register for research each quarter (CTSC 6890) in order to retain student status.** This does not preclude students from registering for research before course work is complete. These students retain full-time enrollment status and will be graded on the S-N scale. No credit hours will be assigned, and research is not calculated in the GPA.
THESIS ADVISORY COMMITTEE

Mentor Selection (Thesis Advisor)
Information compiled from the CTSC Ph.D. Student Guide 2018-19:

By the end of their third rotation, students will be asked to select a thesis advisor or mentor with whom they would like to carry out their thesis research. After consultation with the proposed mentor, the student will complete the Mentor Selection for CTS Predoctoral Program Director review and Mayo Graduate School approval. The mentor represents a key person in a successful Ph.D. program. The mentor should be available to meet regularly with the student to evaluate the progress of his, her, or their research, to discuss the problems that inevitably arise, and to provide whatever encouragement, chastisement, or direction proves necessary. Mentors help students form a TAC, complete the Degree Program Form, and develop a thesis proposal. The mentor also provides personal, professional, and academic advice.

Only faculty specifically designated by MCGSBS as having Full Faculty Privileges may serve as thesis advisors. If a scholar would like to work with a faculty member who needs privileges, they can request that these be granted to their potential mentor through discussion with the Predoctoral Education Coordinator. Similarly, if a scholar wishes to have an individual who is not at Mayo serve on their committee (i.e., an external TAC member), they should reach out to Predoctoral Education Coordinator for more information on requirements and processes.

Pre-Thesis Advisory Committee (Pre-TAC)
Information compiled from the CTSC Ph.D. Student Guide 2018-19:

CTS students are strongly advised to form a pre-TAC by the beginning of their second year to support their experiential training. This will prepare students for the formation of their formal TAC. The pre-TAC will help the student and mentor formulate specific aims that will form the basis of the student’s thesis proposal that will be used in the Oral Qualifying Exam.

Thesis Advisory Committee (TAC)
Information compiled from the CTSC Ph.D. Student Guide 2018-19:

The student, their thesis advisor and the CTS Predoctoral Program Director will establish a formal TAC to monitor the student’s thesis research progress. This should be established no later than the beginning of the student’s third year. The student’s adviser is chair of the committee. TAC composition requires approval of the CTS Predoctoral Program Director prior to submission to the MCGSBS for approval; this pre-approval is done via eForm, routing it directly to the CTS Predoctoral Program Director. All committee members must have graduate faculty privileges. The thesis advisory committee must consist of:

- Five members; any additional members beyond five will be ex-officio
The committee for M.D.-Ph.D. students must include a member of the M.D.-Ph.D. Executive Committee either as a voting member or ex-officio:

- All faculty must have graduate faculty privileges
  - Three must have full privileges, including the chair
- A minimum of two members must be designated by the Program Director as Experienced Examiners for the CTS Track

**Thesis Progress Reports**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

Students are required to meet with their thesis advisory committee at least every six months. At the meetings, the student will present progress on his, her, or their thesis project. The Committee will offer advice, and an evaluation of the student’s progress will be discussed with the student at the end of the meeting. The TAC Progress Report & Individual Development Plan - Expandable Word doc with IDP instructions will serve as a record of the committee discussions.

An Individual Development Plan (IDP) is part of this progress report. IDPs are written plans that give mentees ownership and structure to assess their skills, interests, and values. The form will help to define clear and actionable goals, help with career option exploration and provide the mentee tools to facilitate conversations with their mentors. Additionally, students should be including conference travel and grant updates in the IDPs. Once these forms are complete, they will be sent to the Predoctoral Education Specialist for electronic signature circulation and finally forwarded to MCGSBS.

In addition to meeting with their Committee at least every six months, students are encouraged to consult with members of their Committee for advice as necessary.

**Scheduling Progress Report Meetings**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

Students may work with the CTS Predoctoral Education Coordinator to schedule thesis advisory committee meetings.
EXAMINATIONS
Information compiled from the CTSC Ph.D. Student Guide 2018-19:

The qualifying examinations are intended to test the student’s breadth of understanding in the sciences related to the chosen field of study and to evaluate the student’s ability to reason critically.

Written Qualifying Examination (WQE)
Information compiled from the CTSC Ph.D. Student Guide 2018-19:

The WQE must be completed before the end of the second year. The CTS Predoctoral Education Coordinator will assist students in selecting the date for the exam. The following courses must be completed prior to taking the exam:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORE 6000</td>
<td>Responsible Conduct of Research</td>
<td>1 cr.</td>
</tr>
<tr>
<td>CORE 6050</td>
<td>Critical Thinking and Scientific Writing*</td>
<td>2 cr.</td>
</tr>
<tr>
<td>CORE 6100</td>
<td>Chemical Principles of Biological Systems</td>
<td>3 cr.</td>
</tr>
<tr>
<td>CORE 6150</td>
<td>Genome Biology</td>
<td>3 cr.</td>
</tr>
<tr>
<td>CORE 6510</td>
<td>Mechanisms of Human Disease</td>
<td>3 cr.</td>
</tr>
<tr>
<td>CTSC 5010</td>
<td>Clinical Research Protocol Development</td>
<td>2 cr.</td>
</tr>
<tr>
<td>CTSC 5020</td>
<td>Regulatory Issues in Clinical Research</td>
<td>1 cr.</td>
</tr>
<tr>
<td>CTSC 5370</td>
<td>Introduction to Epidemiology**</td>
<td>2 cr.</td>
</tr>
<tr>
<td>CTSC 5600</td>
<td>Statistics in Clinical and Translational Research (or Core 6650)</td>
<td>2 cr.</td>
</tr>
<tr>
<td>CTSC 5601</td>
<td>Utilizing Statistics in Clinical Research (or Core 6650)</td>
<td>1 cr.</td>
</tr>
<tr>
<td>CTSC 5720</td>
<td>Clinical Trials: Design and Conduct</td>
<td>1 cr.</td>
</tr>
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</table>

*CORE 6050 is a prerequisite only for scholars matriculating in or after July 2019.

**Note that scholars who have completed the older version of CTSC 5300 and 5310 prior to Spring 2019 may use these credits as prerequisites for their Master’s Written Comprehensive Exam.

The WQE will test the breadth of biomedical knowledge, analytic and critical reasoning skills. The written examination may be taken no more than twice. If it is not passed on the first attempt, it must be retaken by the end of the quarter following the quarter in which the exam was first taken. Failing the examination twice will result in dismissal.

For the WQE, students will be given two or three sets of very recently published manuscripts. The student will review the manuscripts and choose one set as the basis in developing a research question. The examination consists of writing an NIH-formatted research proposal based on the student’s question. Students will be given 72 hours to complete this exam.
Oral Qualifying Examination (OQE)

**OQE Structure:**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

When the WQE has been passed, the OQE may be taken. The CTS Predoctoral Education Coordinator will assist the student in selection of the examination date. For the OQE, students will submit a written thesis proposal and defend their thesis research proposal. The proposal should summarize the goals, methods, and rationale for the research project. The specific guidelines for the form of this proposal are available from the CTS Predoctoral Education Coordinator.

The OQE will be composed of two or three parts. The first part will be an oral presentation by the student of his/her proposal; the second part will be a discussion between the student and the committee about this proposal. If there were any conditional elements or weaknesses identified at the time of the WQE, the committee may then add a third part to the examination which will include a wide-ranging discussion of either the area of deficiency or course work material covered by the student during the first two years. Students will be notified after their written qualifying examination whether this third component should be expected during the oral qualifying exam.

The OQE must be completed by December 31st of the third Ph.D. year. All approved committee members must be present at the exam unless prior arrangements have been made with MCGSBS. Only one dissenting vote will be allowed for a “Pass” or “Conditional Pass.” In the event of a Conditional Pass, the specific requirements that must be satisfied by the student will be listed on the back of the Ph.D. Oral Qualifying Examination Report form. The oral qualifying examination may be taken no more than twice. If it is not passed on the first attempt, it must be retaken by the end of the quarter following the quarter in which the exam was first taken. Failing the examination twice will result in dismissal.

**Oral Qualifying Exam Committee**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

OQE committee composition is determined upon consultation with the CTS Predoctoral Program Director. This may or may not include members of the scholar’s TAC.

The OQE committee consists of:

- A minimum of four members from four different independent research programs
- Three of the four must have full graduate faculty privileges, including the committee chair
- Two of the four must be designated by the CTS Predoctoral Program Director as Experienced Examiners.
Thesis Defense

Thesis Proposal

Information compiled from the CTSC Ph.D. Student Guide 2018-19:

A written thesis proposal, presentation and thesis committee discussion of the proposal must be completed by the middle of the student’s third graduate year for Ph.D. students and the middle of the second year for M.D.-Ph.D. students. This requirement may be accomplished during the oral qualifying examination or at a separate committee meeting for this purpose. The thesis advisory committee must be approved prior to this committee discussion. The Mayo IRB must review all protocols for research involving the use of human subjects and The Institutional Animal Care and Use Committee (IACUC) must review all protocols involving the use of animals. It is the candidate’s responsibility to secure approval of any such protocols before the research is undertaken.

Preparation of Thesis

Information compiled from the CTSC Ph.D. Student Guide 2018-19:

MCGSBS has developed standards for its format and style, which should be closely followed. Copies of the Guidelines for Preparing your Ph.D Thesis are available on the MCGSBS intranet site at MCGSBS Thesis Guidelines.

The student’s adviser must sign a form indicating that he/she has read the thesis and that it is ready for defense prior to distribution to the committee members. The Verification of Thesis Ready to Defend form can be accessed on the Mayo Graduate School intranet site at Verification of Thesis Ready to Defend form. The thesis must be submitted to the thesis advisory committee at least four weeks prior to the final examination. Students enrolled in the M.D.-Ph.D. program must submit their final thesis to their thesis advisory committee before they can resume studies in Mayo Medical School.

Sample theses may be found through the Mayo Clinic Library’s Proquest Search Tools.

Thesis Defense

Information compiled from the CTSC Ph.D. Student Guide 2018-19:

The final oral examination (thesis defense) can be scheduled after the qualifying written and oral examinations have been passed, all course work shown on the Degree Program form has been completed and the Verification of Thesis Ready to Defend form has been filed in the MCGSBS office.

At least four weeks prior to the scheduled thesis defense, the student should provide copies of the thesis manuscript to their TAC for review.

The presentation of the thesis work is open to the public. Immediately after the presentation, the student will meet privately with the TAC. Voting members of the TAC must be present in real time via physical presence or video/teleconferencing at the final oral examination. Should a voting member fail
to participate in the thesis defense, their vote will count as a “Fail.” The Committee will ask questions about the thesis and will inform the student if the thesis is satisfactory. Only one dissenting vote will be allowed for a “Pass.” Passage of the final oral examination requires a minimum of four passing votes; otherwise, a determination of “Fail” must be made. The final oral examination may be taken no more than once. Failing the examination will result in dismissal.

**Final Thesis Corrections**

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

After the student has passed their thesis defense, the student’s mentor must sign a form indicating that he/she is satisfied that the final corrections to the thesis have been made. MCGSBS will not certify completion of degree requirements until the final thesis has been submitted to ProQuest. The final thesis should be submitted online. **Ph.D. appointments will continue no more than 30 days beyond the date of a successful thesis defense.**

Guidelines for completing thesis edits, submitting the final thesis manuscript, and MCGSBS checkout policies are provided upon successful completion of thesis defense.
STUDENT FUNDING – TRAINING GRANTS

NIH F Awards
*Information compiled from the [CTSC Ph.D. Student Guide 2018-19](#):*

CTS students are all encouraged to utilize the proposals they developed in the CORE 6050 Critical Thinking and Scientific Writing and CTSC 5010 Protocol Development courses as the basis for their F-award application.

NIH T Awards
*Information compiled from the [CTSC Ph.D. Student Guide 2018-19](#):*

During their first four years, some CTS Ph.D. students will receive stipend support from an NIH institutional training grant. All students supported on NIH training grants are subject to the following requirements:

- Complete a Statement of Appointment form (PHS 2271) annually
- Provide annual reports on the progress of his, her, or their doctoral studies
- Acknowledge the training grant in all publications resulting from his, her, or their doctoral studies
- Complete a Notice of Termination form (PHS 416-7) upon termination of training grant support.
- Complete the Course Requirements for Training Grants (Responsible Conduct of Research)
ADMINISTRATIVE PROCESSES

Course Registration

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

Course registration is completed through Banner (online). The first time you register for courses a paper registration form will need to be filled out and returned to the registrar’s office via fax, and registration is completed online thereafter. Late registrations and withdrawals are to be completed on paper and submitted to the CTS Curriculum Education Specialist.

- Registration Form
- Late Registration/Course Withdrawal Form

Students will also be asked to meet with the CTS Predoctoral Education Coordinator to assess progress (at least two times per year). Note that meetings are more frequent for those earlier in their programs (i.e., those in their first and second years).

Degree Planning Tool

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

Students are expected to complete and update a Degree Planning Tool throughout their training. This form lists all course work completed and proposed to fulfill degree requirements, including transfer credits. Fifty percent of the credits on the degree program form must be graded on the A-F grading system. Prior to submission to MCGSBS, the form must be approved by the CTS Predoctoral Program Director.

Mentor Selection (Thesis Advisor)

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

By the end of their third rotation, students will be asked to select a thesis advisor or mentor with whom they would like to carry out their thesis research. After consultation with the proposed mentor, the student will complete the Mentor Selection for CTS Predoctoral Program Director review and MCGSBS. The mentor represents a key person in a successful Ph.D. program. The mentor should be available to meet regularly with the student to evaluate the progress of his, her, or their research, to discuss the problems that inevitably arise, and to provide whatever encouragement, chastisement, or direction proves necessary. Mentors help students form a TAC, complete the Degree Program Form, and develop a thesis proposal. The mentor also provides personal, professional, and academic advice. Only faculty specifically designated by the MCGSBS as having Full Faculty Privileges may serve as thesis advisors.

Travel Requests

*Information compiled from the CTSC Ph.D. Student Guide 2018-19:*

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The maximum number of trip days allowed per appointment year for presentations is 18. Repeated presentation of the same material is discouraged.

One trip per year for attendance-only is allowed and must be funded through the student’s mentor. The maximum number of days absent is 5. Trip days will not be assessed for travel over weekends or holidays.

Students must make air travel reservations at least one month prior to the meeting dates. Airfare for trips involving presentation or attendance must follow Institutional policy. All travel arrangements must comply with Mayo Travel Policy regarding travel.

Travel Procedures
Information compiled from the CTSC Ph.D. Student Guide 2018-19:

All trip requests, CTS & non-CTS funded, must first be approved by the CCaTS Predoctoral Programs Committee. Students must submit the following the CTS Predoc Travel Communication to the CTS Predoctoral Education Coordinator.

See Travel Procedures for CTS Students (Blackboard – CTS Ph.D. Program)

Trip requests must be made a minimum of two months in advance to allow for committee review. Trip requests will be discussed and approved or denied by the CCaTS Predoctoral Programs Committee. The CTS Ph.D. program requires an oral or poster presentation at the ACTS Annual Meeting at least once.

Vacation
Excerpted from the CTSC Ph.D. Student Guide 2018-19:

Students are allowed 15 days of vacation per year beginning on the date of commencement of their appointment. Weekends and holidays are not charged as vacation time. Vacation cannot be carried over from one 12 month period to another. Approval to take vacation is obtained from the CTS Predoctoral Education Specialist until an adviser has been identified. Because there is no "official" record kept of vacation usage, students will not be paid for unused vacation when they check out.

Mayo acknowledges and closes on six national holidays:

- New Year’s Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Day

Additional information on holiday policies can be found here.
Supply Requests

*Information compiled from the* [CTSC Ph.D. Student Guide 2018-19](#):

Students will be given up to $2000 per academic year for the purchase of NIH-Allowable supplies or expenses directly related to their coursework or research. In order to receive approval, please submit the [CTS Predoc Request for Expense/Supplies Funding](#) form to the CTS Predoctoral Education Coordinator for committee review and approval. Please allow at least 2 weeks for the approval process.
RESPONSIBLE CONDUCT OF RESEARCH

*Information compiled from the [CTSC Ph.D. Student Guide 2018-19](#):*

All research students, fellows, and staff funded by an NIH grant must complete a course in responsible conduct of research before graduation. Also, before beginning contact with either human or animal subjects, students, as all researchers, must obtain the appropriate approval for their projects from either an Institutional Review Board (IRB) or the Institutional Animal Care and Use Committee (IACUC). In both cases, the student’s thesis advisor must be involved in this process, since the protocol for the research project is submitted under the faculty’s name with the student listed as a student investigator. It is important to remember that NO contact can be made with humans, human tissue, human samples or human records without prior approval of the protocol by the IRB. NO animals can be purchased for examination without an IACUC protocol approval. It is important for students to check to make sure they are either listed on their mentor’s approved protocol or have obtained approval for their research protocol, in collaboration with their mentor.
Academic Policies and Protocols

Course Registration and Prioritization

Course registration is completed through Banner (online). The first time trainees register for courses a paper registration form is needed and must be returned to the registrar’s office via fax, and registration is completed online thereafter. Late registrations and withdrawals are completed on paper and submitted to the CTS Curriculum Education Coordinator for your respective program. For additional information and links to necessary documents, please see the MCGSBS intranet page.

Due to limited space in many courses, prioritization for enrollment for credit is given to certificate- or degree-seeking (master’s and predoctoral) scholars. The prioritization is included in the course listings on the CCaTS Education Website. If you have questions regarding eligibility for a course or placement on a waitlist, please reach out to your CTS Curriculum Education Coordinator for additional information.

Typically, auditing is not permitted in CTS course offerings. If a trainee feels auditing is appropriate and is unable to enroll for credit they should contact the course directors directly.

Course Attendance

Scholars enrolled in CCaTS courses must attend and participate in all lectures, class sessions, and activities. Attendance policies for each course are included in each course’s syllabus.

For some courses, unexcused absences may affect the scholar’s participation grade or may result in a reduction of the final grade. The number of absences allowed is specified in each course’s syllabus.

Students are not penalized for absences related to legitimate circumstances (illness, conference attendance, religious observances, bereavement, etc.), but must contact the instructors directly for additional information or to request an excused absence at least one week in advance if possible.

Note that if a scholar accrues a certain number of absences (excused or unexcused), they may be advised to withdraw from the course or receive an incomplete. This process allows for trainees to determine a more appropriate time during their training to complete the course.
Disability Accommodations Policy

MCGSBS and CCaTS are dedicated to ensuring a supportive environment for scholars with disabilities. Both the MCGSBS and CCaTS follow the disability accommodations policy set forth by the MCCMS. The full disability policy for the MCCMS is available on the Mayo Intranet and below.

Briefly, the MCCMS requires the learners to disclose any disability before providing reasonable accommodations. Scholars needing accommodations are strongly encouraged to disclose their disability and needs before the start of coursework, and are sent a Disability Accommodations Registration and Service Statement form upon matriculation. Disabilities are registered at any time during the scholar’s tenure at the MCCMS, though accommodations will not be retroactively applied to completed work.

The MCCMS does not discriminate against any qualified applicant or enrolled learner on the basis of race, color, religion, sexual preference, age, disability, or other protected status in admission or access to programs, services, activities, and facilities offered.

Information in files about the learner’s disability and/or reasonable accommodations is not released except as permitted by law, including the Family Educational Rights and Privacy Act (FERPA). Files and accommodations are managed by Academic Success Advisors within the MCCMS, with all confidential information is kept confidential and separate from the scholar’s official academic record.

For any trainee who needs assistance with audio, visual or other special needs (including facilities and/or adjusted time for homework and exams): they must submit a request within one week of the first class to the Office for Diversity and Inclusion (ODI) to arrange for the necessary accommodations. The contact for the ODI is on the Mayo Clinic Intranet website, and is included on individual course syllabi.

For more details, please visit: Disability Accommodations Policy and Disability Accommodations Procedure
Academic Misconduct and Dishonesty Policies

The MCGSBS and CCaTS follow the Academic Misconduct Policies set forth by the MCCMS. Trainees are responsible for knowing and complying with all MCGSBS Policies, which can be found at: MCGSBS School Policies. Key portions of these policies are summarized below. Academic misconduct (non-academic deficiency) includes, but is not limited to:

- Plagiarism from any source (online, print, etc.)
- Collaborative efforts on assignments, exams, etc., for which collaboration is not allowed
- Re-use of homework/exams from prior course participants and colleagues enrolled in the course
- Use of solution files for homework assignments
- Discussing assignments with colleagues and/or mentors and writing down answers verbatim
- Cheating on quizzes and exams, including sharing answers and collaborative efforts if explicitly forbidden
- Use of study materials not available to other scholars

Note that, per graduate school policy, if a scholar shows their homework to other scholars, if the other scholars are found guilty of academic misconduct for that assignment, the scholar initially providing guidance is also implicated in the academic dishonesty case.

Non-Academic Deficiency is defined by the MCCMS as: “behavior judged to be illegal, unethical or objectionable and in violation of school or institutional policies or rules, civil or criminal law. Examples of non-academic deficiencies include, but are not limited to, the following:

- Violations of mutual respect.
- Threatening, intimidating, harassing, or coercing patients, learners, employees, volunteers, or visitors on Mayo Clinic’s premises at any time for any reason.
- Lying or cheating, misrepresentation, plagiarism.
- Distribution, possession or use of alcoholic beverages, non-prescribed drugs or illegal/controlled substances on Mayo Clinic property.
- Reporting with the odor of alcohol on one's breath, or appearing to be under the influence of alcoholic beverages or any drug that impairs judgment or work performance.
- Theft, misuse, misallocation or inappropriate removal or disposal of property belonging to Mayo Clinic, patients, learners, employees, or visitors.
- Breach of ethics concerning confidentiality of employee, patient, or institutional information.
- Engaging in criminal behavior.
- Engaging in sexual misconduct (see Title IX Sexual Misconduct Policy).
- Any deliberate or negligent act which jeopardizes the health or safety of a patient, employee, learner, volunteer or visitor.
- Fighting, agitating a fight, or attempting bodily harm or injury to anyone on Mayo Clinic property.
- Bringing a firearm or weapon onto Mayo Clinic property without authorization.
- Failure to report for expected assignments without notification.
- Disruptive behaviors which compromise the learning environment of colleagues.
- Conscious and reckless disregard for safety rules or Mayo Clinic's safety practices

For more details, please see: Warning, Probation, Dismissal, and Appeal Policy
Plagiarism Guidelines

All work submitted must consist of the student’s original ideas. If other sources are included in your work, they must be properly identified and cited. You may not use work you submitted for another course unless approved by the course director.

Note that reusing text from your own prior work (assignments, manuscripts, etc.) is self-plagiarism. This is considered a form of academic dishonesty and subject to the same policy oversight as plagiarism of another’s work. Please consult mentors and faculty to determine if work from prior courses is usable in other courses.

Plagiarism is a form of academic dishonesty. Penalties for plagiarism range from failing the course to suspension from MCGSBS. CCaTS utilizes plagiarism tools for work submitted, as outlined in the MCGSBS’ policies.

To ensure trainees are not inadvertently plagiarizing, Turnitin (must be logged in to the Mayo network) is a plagiarism detection service offered free to students. Use this resource to help detect inadvertent plagiarism in your work. For assistance with accessing the Mayo Clinic Turnitin license, please contact a Mayo Clinic Librarian.

Consequences of Academic Misconduct and Dishonesty

MCGSBS and CCaTS follow the Academic Misconduct Policies set forth by the Mayo Clinic College of Medicine and Science.

When a scholar’s academic performance or behavior does not meet the minimum academic standards set forth by the Mayo Clinic College of Medicine and Science, faculty and administration will follow the “Warning, Probation, Dismissal, and Appeal Policy and Procedure” set forth by the College. This policy can be found in its entirety on the Mayo Clinic College of Medicine and Science intranet page: Warning, Probation, Dismissal, and Appeal Procedure

If academic misconduct or dishonesty is identified by either other scholars or faculty within CCaTS, it is reported to CCaTS Staff and Administration, namely the Associate Director for Curriculum. Such behavior is tracked internally within CCaTS by the Education Resource team and is kept confidential. The team will follow the process below and inform the course faculty of the results. This information is shared with other faculty only if the scholar has committed a “second incident” of academic misconduct (non-academic dishonesty). Note that academic misconduct or dishonest behavior is tracked internally for all scholars enrolled in courses, regardless of whether they are degree-seeking or not.

If it is the first incident of academic misconduct or dishonesty by the scholar:

- Handling of the incident will be addressed at the level of CCaTS. Depending on level of incident, any of the following may occur:
  - An informal written warning issued to the scholar from CCaTS Education Resources
A discussion with the faculty member and scholar involved in the presence of an impartial third party CCaTS staff member
- A discussion with 2 members of CCaTS staff
- Loss of points for assignment in course
- Escalation of incident to Graduate School for formal evaluation

- Incident is documented internally and confidentially within CCaTS by the Research Operations Coordinator. This information is tracked across courses within CCaTS.
- Option to escalate based on severity

If it is the second incident (or higher) of such behavior by the scholar:

- Handling of the incident is escalated to the level of the Graduate School
- Incident is documented internally and confidentially within CCaTS by the Research Operations Coordinator. This information is used to track incidents across courses within CCaTS.
- The Graduate School determines appropriate consequences based on their policy. This policy is found in its entirety on the Mayo Clinic College of Medicine and Science intranet page: Warning, Probation, Dismissal, and Appeal Procedure
  - Briefly, the Education Leadership determines the appropriate remediation plan to address the behavior with the scholar
  - The Graduate School Administration:
    - Reviews and approves the remediation plan set forth by the Education Leadership
    - Generates and signs a formal written warning
    - Issues the formal written warning to the scholar
  - The scholar is expected to follow the remediation plan included in the formal written warning
  - At the end of the written warning period, the Administration and Education Leadership will review the scholar’s progress with remediation, and complete one of the following actions:
    - Remove the learner from formal warning status and return to good standing
    - Extend the period of formal warning
    - Place the scholar on probationary status
  - At the end of an extended formal warning period, the Education Leadership and Administration will review the scholar’s progress again, and determine whether to remove the warning or probationary status, or whether it should remain on the scholar’s academic record until completion of their educational program

For more details, please see the full policy in its entirety on the Mayo Clinic College of Medicine and Science intranet page: Warning, Probation, Dismissal, and Appeal Procedure
Faculty-Student Mediation Processes
Should a concern arise between a scholar and a faculty member, resources are available to support mediation processes. Scholars and faculty have different options for assistance with mediation, including:

- Use of the MCGSBS’ Ombudsperson
  - An ombudsperson is defined as “a person who facilitates problem resolution for students who encounter difficulties with MCCMS policies, procedures, or program staff”
  - Full ombudsperson policy available at: MCGSBS Ombudsperson Policy
  - Contact Student Services or the Office of Student Affairs at your respective Mayo Clinic Site for more information
- Assistance from CCaTS Education Staff and Leadership
- Assistance from the Assistant Dean, Associate Dean, or Dean of MCGSBS

Support may include the provision of an impartial individual moderating dialogue or assistance with identifying an appropriate mediator.

Appeal Process
If the scholar chooses to pursue an appeal, the process proceeds as follows:

- The scholar must submit a letter of appeal to the school dean within five business days of receipt of notification of probation or dismissal
- The Administration will subsequently:
  - Provide acknowledgement to the scholar of receipt of the appeal in writing
  - Notify the Executive Dean of the Mayo Clinic College of Medicine and Science that the scholar has submitted an appeal
  - Determine if the site’s Chief Executive Officer needs notification
  - Identify and assemble an Appeal Committee and schedule a date for the committee to meet within 14 business days
  - Schedule the Appeal Committee meeting to occur within 30 business days of receiving the scholar’s appeal. Any exceptions to this timeframe is explained to the scholar
  - Provide details of the Appeal Committee to the learner in writing once the meeting date is confirmed.
- The scholar will submit a written reason for the appeal to the Administrator, along with any supporting documentation
- The Appeal Committee will:
  - Review relevant information
  - For appeals against probation, they will determine if the appeal is resolved based on the submitted written record, or if the learner must appear before the Appeal Committee
  - Meet with the scholar on the scheduled Appeal Committee date to hear the scholar’s summary of the basis for appeal
Hear any stakeholder and/or witness accounts needed at the Appeal Committee meeting

Choose one of the following options:

- For probation:
  - Uphold the probation
  - Remove the probation from the scholar’s record and reduce the probation to a Formal Written Warning with remediation plan
  - Dismiss the learner

- For dismissal:
  - Uphold the dismissal
  - Overturn the dismissal and place the scholar in probationary status with remediation plan

Provide the scholar with written documentation of the decision within 5 business days of the Appeal Committee meeting date

- The CCaTS Education Resource Leadership will initiate the school’s check-out process, if the dismissal is upheld
Academic Probation

Scholars enrolled in CCaTS programs, including the Certificate, Master’s, and Predoctoral programs, are expected to maintain a minimum GPA of 3.0 to be in good standing and eligible for completion of comprehensive written exams, oral exams, thesis defenses, and graduation.

If a scholar’s GPA falls below 3.0 in a given quarter, the scholar is placed on academic probation, as described in the Mayo Clinic College of Medicine and Science’s “Deficiencies and Unsatisfactory Progress” and “Warning, Probation, and Dismissal” policies; these can be found on the MCGSBS Policies and Procedures website.

If a scholar’s academic GPA falls below 3.0 in a given quarter, the following actions are taken:

- A written notice of deficiency is administered by the Senior Associate Dean of Academic Affairs, which includes the following:
  - Explanation of the deficiency
  - Remediation required
  - Timeline by which remediation are completed
  - Consequence if remediation not completed by defined timeline

- Potentially, this warning is done formally, as determined by the Student Promotions and Assessment Review Committee (SPARC)

- Formal written warnings and/or probation are placed upon the scholar without first receiving a notice of deficiency, as determined by SPARC

For the full policy, please visit: [Deficiencies and Unsatisfactory Progress](#)
Academic Conduct and Deficiencies

Academic Deficiency is defined by the Mayo Clinic College of Medicine and Science as “failure to maintain a satisfactory academic record. Examples of academic deficiencies include, and are not limited to the following:

- Inability to master the technical skills required to competently practice in the specialty.
- Inability to apply knowledge appropriately to the situation.
- Unsatisfactory interpersonal and/or communication skills with patients, colleagues, and other personnel.
- Unacceptable academic commitment, such as, not fulfilling all responsibilities, not participating in all required educational activities, and not completing all required documentation and assignments.
- Unsatisfactory recognition of own limits, such as failing to seek appropriate help when indicated.
- Failure to meet program or school specific academic requirements.
- Disregard for patient safety.”

Note that Academic Deficiencies and Misconduct are handled using the same “Warning, Probation, Dismissal, and Appeal Policy” outlined earlier in this handbook in the section “Academic Misconduct and Dishonesty Policies,” subsection “Consequences of Academic Misconduct and Dishonesty.”

For additional information and the full policy, please visit: Warning, Probation, Dismissal, and Appeal Policy


**Requesting Grade Changes**

If a scholar has a specific reason for requesting a grade change based on their academic performance in class, it is the responsibility of the scholar to take appropriate actions to request a change to their grade.

Such actions include contacting the faculty directly with the request and reasoning behind the request. Requests are made as soon as possible for the individual assignment. Note that faculty must submit final grades to the Graduate School within two weeks of the end of the course, so all requests for grade changes must be made within 48 hours of the final course session or receipt of graded work.

It is the scholar’s responsibility to monitor their grades and feedback on Blackboard, and to reach out to faculty and staff if there are any concerns. Scholar grades are delivered through Blackboard, rather than via email or in-person; we recommend that scholars make a habit of regularly checking their course progress. Transcripts can be accessed by following the instructions provided here: [Print Unofficial Transcript](#)
Additional Training Opportunities

Academic writing workshop
For scholars who may need additional training in writing for biomedical publication, CCaTS offers an annual “Writing and Publishing High-Impact Research Manuscripts.” This workshop, which occurs each March, focuses on the fundamentals of writing for peer-reviewed original research publications. Advance registration is required. Cost of the workshop may be covered if the scholar is enrolled in a degree-seeking program, or may be supported by their department. Additional information is available here:

Write and Publishing High-Impact Research Manuscripts

Grant writing workshop
For scholars seeking to develop or improve their grant writing skills, CCaTS offers an annual “Write Winning Grant Proposals.” This workshop, which occurs each November, is a one-day workshop focusing on the fundamentals of writing a strong grant proposal. Advance registration is required. Cost of the workshop is covered if the scholar is enrolled in a degree-seeking program, or may be supported by their department. Additional information is available here:

Write Winning Grant Proposals
Resources for Scholar Success

Additional resources available in the graduate school (academic and emotional support)

If you have concerns (academic or personal), we encourage scholars to connect with the appropriate student services through the Mayo Clinic College of Medicine. The Student Services webpage provides detailed information and points of contact for a variety of student needs:

- Bursar
- Financial Aid Office
- Ombudsperson (mediator)
- Operations
- Registrar’s Office
- School Support
- Stipend Payments
- Verifications
- Wellness and Academic success
  - Learning, studying, and time management strategies
  - Test-taking preparation
  - Disability Services
  - Mental health, counseling
  - Testing anxiety
  - Assessment for disability, accommodations, return to school

The Student Wellness page contains detailed information and points of contact for:

- Academic Challenges
- Health and Exercise
- Stress and Burnout
- Work-Life Balance
- Crisis Situations
CCaTS Contacts for additional information

For scholars and faculty seeking additional information and support on courses and schedules, please reach out to CTSCeducation@mayo.edu. If seeking information regarding a specific program, please email CCaTSEducProg@mayo.edu.