CLINICAL AND EPIDEMIOLOGICAL RESEARCH (MS)

Visit program website. (https://epibiostatlearning.ucsf.edu/master-science-clinical-epidemiological-research)

Degree Offered: MS
Program Leadership:
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Program Description

Master's Degree Program in Clinical and Epidemiological Research (https://epibiostatlearning.ucsf.edu/master-science-clinical-epidemiological-research) is a two-year program that through enhanced coursework and precepting provides trainees with mastery of clinical and epidemiological research methods and culminates in a number of required products including a comprehensive literature review, a presentation at a national or international scientific conference, and publication of a peer-reviewed scientific paper.

For complete information on the Master's Degree Program in Clinical and Epidemiological Research and degree tracks, please visit our website (https://epibiostatlearning.ucsf.edu/master-science-clinical-epidemiological-research).

Admission Requirements

The following qualifications are required:

- An undergraduate degree from an accredited institution with a minimum grade point average of 3.0 (equal to a letter grade of B).
- Preference will be given to applicants who have demonstrated knowledge or experience in some aspect of a health-related field (e.g., clinical practice, public health, health promotion, clinical research coordination, industry) though such knowledge is not required.
- Ability to devote 50% time to formal coursework and attend a longitudinal seminar series in person.
- International scholars must demonstrate proficiency in the English language. Please visit the Graduate Education and Postdoctoral Affairs (https://graduate.ucsf.edu/) website for specific guidelines on how this requirement can be met: International Admission Requirements (https://graduate.ucsf.edu/admission/intl-admission-requirements)

Preference will be given to applicants who have demonstrated knowledge or experience in some aspect of a health-related field (e.g., clinical practice, public health, health promotion) by virtue of a graduate or professional doctoral degree (M.D., D.D.S., Pharm. D., Ph.D. or international equivalent), being currently enrolled in such a program or relevant work experience. Although not required, this prior knowledge or experience is preferred because program scholars will be required to perform original research in an area of their choosing to fulfill graduation requirements. Prior substantive knowledge or experience in a health-related field can be very helpful in identifying a research area of interest and in maintaining motivation for the work.

UCSF does not use race, gender, sex, or other protected categories or proxies for protected categories in the admissions process.

How to Apply

Applicants can begin submitting their applications on September 1 each year. Applications are reviewed on a rolling basis, and admission decisions are typically made within six weeks. Early application is particularly encouraged for applicants originating outside of the San Francisco Bay Area who may require housing or travel visas.

Affirmation of the Professional Conduct Statement (signed during orientation).

Find application information on our website (https://epibiostatlearning.ucsf.edu/apply-now).

Learning Outcomes

To complete the program, scholars must satisfy program objectives, which are to:

1. Acquire a mastery of a broad set of clinical research methods
2. Plan and implement one or more clinical research projects that lead to a first-author publication
3. Obtain experience in the instruction of clinical research methods

Upon completion of the program, graduates receive a Master of Science in Clinical and Epidemiological Research from UCSF. Graduates are poised to work in a variety of research settings, including universities, public health departments, foundations and private industry. (Note: The program does not provide instruction in laboratory investigation and is not intended for scholars who envision themselves working primarily in a wet laboratory.) Additionally, the master's degree can potentially strengthen applications to PhD, resident or medical school.

Additional Information

Career Outcomes

- *Find* career outcomes and other data on Master's programs *(*https://graduate.ucsf.edu/admission/graduate-program-statistics/clinical-mas-statistics*) on the Graduate Education and Postdoctoral Affairs website.*

Degree Requirements

1. **Courses**
   Master's students must complete at least 38 units of coursework. Core course units make up 30 units. Students receive 2 units of credit for their educational apprenticeship rotation. Students can take electives that align with their interests to meet the 38-unit requirement.

   Graduate students must maintain a cumulative grade point average of 3.00 (B) and must make satisfactory progress toward the degree as defined by the program. Students who fail to maintain a 3.00 grade point average or fail to make satisfactory progress toward the degree are subject to dismissal by the Dean of the Graduate Division after consultation with the faculty of the degree program.

   Grading policy (https://epibiostat.ucsf.edu/current-students#Policy-on-Student-Progress) is determined by the UCSF Division of Graduate Education and Postdoctoral Affairs.

Policies and procedures governing graduate study at UCSF are available on the Graduate Education and Postdoctoral Affairs website (https://graduate.ucsf.edu/). (https://graduate.ucsf.edu/students/registration-policies-and-deadlines)

2. **Accomplishment of the Following Products of Clinical Research:**

The following requirements follow the natural progression of a research project, from a review of the existing literature to publication. Each element of the required work is relevant to student's research productivity and enhances his or her credibility as an emerging researcher. Before embarking on these products, scholars should have their concepts approved by each member of his or her master's committee (https://epibiostat.ucsf.edu/current-students#Masters%20Committee).

- Comprehensive literature critique: Each master's student composes a systematic review and critique of the literature pertinent to a specific research question (or set of related questions) in his or her research field, culminating in a five to 10-page report that demonstrates a mastery of the field's literature. The fundamental objective of this requirement is for the scholar to demonstrate that he or she can evaluate a number of papers/reports regarding a particular substantive question (or set of related questions), provide high-level critique of the threats to validity in the individual papers and then come to a conclusion about the question(s) in hand. The critique must have a methods section detailing the process for identifying and analyzing the articles. The report should be undertaken with an eye toward formal publication, but this is not required. Students are expected, although not required, to complete this requirement by the end of the first year.
- First-authored oral or poster presentation at a national or international meeting: Students are required to submit a first-authored abstract to a nationally or internationally recognized scientific meeting/conference within the scholar's academic field and have that abstract accepted for either poster or oral presentation. It may be acceptable in selected cases, with pre-approval by the scholar's master's committee (https://epibiostat.ucsf.edu/current-students#Masters%20Committee), to present work that was started prior to enrollment in the program. It is expected that the work represent a substantive contribution to the scholar's research field.
- Submission as first author of a peer-reviewed manuscript: Using data analyzed (but not necessarily collected) during residence in the master's program, students must prepare and submit a first-authored manuscript for publication in a peer-reviewed journal that is approved by the master's committee (https://epibiostat.ucsf.edu/current-students#Masters%20Committee). It may be acceptable in selected cases, upon approval of the scholar's committee, to submit work that was started prior to enrollment in the program. The manuscript may be a comprehensive extension of the work submitted in abstract form to a national meeting. It is expected that the work represent a substantive contribution to the scholar's research field.

3. **Instructional Experience in Clinical Research:**

Students are required to gain instructional experience (typically in their second year) in one course within the TICR Program. This experience typically involves leading a weekly small-group discussion section of 10 to 15 students, holding office hours for students and grading homework assignments and projects. Satisfactory completion of this pedagogical experience is required for advancement to degree completion.

Core Courses

Program of Study for the Master's Degree Program in Clinical and Epidemiologic Research

Course	Title	Units
Year 1		
Summer		
EPIDEMIOL 202	Designing Clinical Research (Two Month)	2
EPIDEMIOL 218	Data Collection and Management for Clinical Research	1
BIOSTAT 212	Introduction to Statistical Computing in Clinical Research	1
	Units	**4**
Fall		
EPIDEMIOL 201	Responsible Conduct of Research [1]	0.5
EPIDEMIOL 203	Epidemiologic Methods	4
EPIDEMIOL 204	Clinical Epidemiology [2]	3
BIOSTAT 200	Biostatistical Methods in Clinical Research I	3
EPIDEMIOL 220	Master's Seminar I	1
	Units	**11.5**
Winter		
EPIDEMIOL 222	Social Determinants of Health and Health Disparities	1
BIOSTAT 208	Biostatistical Methods II	3
EPIDEMIOL 220	Master's Seminar I	1
	Units	**5**
Spring		
BIOSTAT 209	Biostatistical Methods III	3
EPIDEMIOL 220	Master's Seminar I	1
EPIDEMIOL 227	Building a Clinical Research Career	1
	Units	**5**
Year 2		
Fall		
EPIDEMIOL 221	Master's Seminar II	1
EPIDEMIOL 300	Clinical Research Educational Practice [3]	2
	Units	**3**
Winter		
EPIDEMIOL 221	Master's Seminar II	1
	Units	**1**
Spring		
EPIDEMIOL 221	Master's Seminar II	1
Electives (Sufficient number of other TICR Program Courses to achieve at least 38 quarter units) [4]		2.5
	Units	**3.5**
	Total Units	**33**

1. EPIDEMIOL 201 can be taken in either Fall or Spring of year 1.
2. EPIDEMIOL 204 can be taken in year 1 or year 2 depending on the learners schedule.
3. Learners only need to enroll in 1 quarter of EPIDEMIOL 300 during their 2nd year. Learners receive a survey asking for course preference and availability. Placement in particular courses cannot be guaranteed but the program will do its best to place learners in their first or second choice course.
4. Electives can be taken at any point during the 2-year program and can be based on learner schedule. Learners should contact the program administrator for any changes to core course schedule.
5. Highly Recommended Electives:
Clinical Trials (EPIDEMIOL 205)

Biostatistical Methods IV (BIOSTAT 210)

See a sample course schedule (https://epibiostatlearning.ucsf.edu/ms-clinical-epidemiological-research-curriculum).

Tracks

The MS program currently has three optional tracks of specialized instruction in which scholars can elect to enroll:

- Clinical Informatics (https://epibiostatlearning.ucsf.edu/ms-clinical-epidemiological-research-tracks)
- Health Data Science (https://epibiostatlearning.ucsf.edu/ms-clinical-epidemiological-research-tracks)
- Implementation Science (https://epibiostatlearning.ucsf.edu/ms-clinical-epidemiological-research-tracks)

Scholars in these tracks will be required to take the core set of courses in epidemiological and biostatistical methods that underlie clinical research and will use their elective courses for focused instruction in their track's specific objectives. If you are opting to complete one of these tracks, please visit their pages for specific course details. Scholars may choose to join these tracks at any time during their residency in the program.

Clinical Informatics Track

Clinical Informatics is the science of how to use and apply data, information, and knowledge to improve human health and health care services. The Clinical Informatics Track within the Masters in Clinical and Epidemiologic Research program seeks to help learners approach clinical informatics research and the translation into practice with scientific rigor. The track emphasizes research in clinical informatics for health equity. Topics will include electronic health record systems, artificial intelligence for human health care, data systems and standards, clinical decision support, clinical informatics health policy and regulation, and implementation and evaluation.

In addition to taking core courses within the Masters in Clinical and Epidemiologic Research program on fundamentals of epidemiology and biostatistics, learners in the Clinical Informatics Track will take a series of multidisciplinary elective courses to deepen expertise in clinical informatics. Students are required to take Introduction to Clinical Informatics (EPIDEMIOL 232) and other electives related to clinical informatics totaling at least 8 units. Other electives eligible for Clinical Informatics Track credit include Data Collection and Management for Clinical Research (EPIDEMIOL 218), Use of Electronic Health Records Data for Clinical Research (EPIDEMIOL 231), and Artificial Intelligence in Clinical Informatics (EPIDEMIOL 233). As we build content within this track, we expect that additional elective courses may be available in the 2026-2027 academic year.

The Clinical Informatics track is ideal for learners who plan to pursue research using electronic health records data or research on the design, implementation, or evaluation of clinical informatics applications.

Data Science in Clinical Research Track

Data science in clinical research is an emerging discipline in response to the explosion of available and complex data in biomedicine and related streams. Data Science in Clinical Research is an emerging discipline — for which there is not a standard definition — in response to the explosion of available and complex data in biomedicine and related streams. Examples of complex data include those from the laboratory (e.g., genomics and other "-omics"), biomedical imaging, electronic medical records, and other "found" data (e.g., social media). The TICR Program believes data science in the context of clinical research is best understood as an interdisciplinary hybrid of the fields of informatics, computer science, biostatistics, and epidemiology. As such, a data scientist has a broad background and expertise in accessing data, manipulating data, and forming inferences (i.e., summarizing raw data into meaningful messages) from data. A data scientist may typically not have as deep an expertise as a dedicated computer scientist, bio/clinical informatician, biostatistician, or epidemiologist in their respective fields, but instead she/he brings unique value because of his/her broad skill set accessing complex data, manipulating complex data, visualizing complex data, and being able to perform a broad array of analytic techniques.

The Data Science in Clinical Research Track of the Master's Degree Program is tailored for researchers who seek to work in complex data environments (sometimes referred to as "Big Data") and who desire to become facile in the manipulation of large (and perhaps unstructured and unwieldy) data structures and the summarization of data into meaningful messages. Coursework in the data science track (https://ucsf.box.com/s/dbkn6i2ha0ovgjd03uezjyaz7l0f2hqt) extends upon MS program's foundation of epidemiology and biostatistics to include required and elective courses in advanced data manipulation, prediction, clustering/pattern recognition and data reduction. The Data Science in Clinical Research Track distinguishes itself from other data science training programs by being embedded into the context of human subjects-based health-related research and a solid base of epidemiology and clinical research. Many of the contextual examples used in the courses and student projects are from the life sciences and clinical care. Graduates of the Data Science in Clinical Research Track are poised to work in either leadership or supportive roles in academia, industry, or municipal health systems.

Implementation Science Track

Implementation science (IS) aims to improve the adoption of evidence-based practices and policies in clinical care and public health, and the development of best evidence through community engagement. Responding to the increasing global concern that the tremendous advances we have achieved in developing effective tests, treatments and preventive measures are not being fully translated into improved population health, the IS track focuses on applying clinical research in real-world settings.

The IS track is ideal for researchers who plan to pursue the development, implementation and/or evaluation of policies, practice-based interventions and/or community-based programs designed to: 1) improve uptake/safety/quality/access; 2) reach diverse populations; 3) reduce the overuse of diagnostic tests or treatments; or 4) provide preventive medicine or health promotion programs.

The IS Track is co-sponsored by the UCSF Implementation Science Program and is directed by Dr. Maria Garcia (https://profiles.ucsf.edu/maria.garcia) and Dr. Priya Shete (https://directory.ucsf.edu/people/search/id/52258). One distinction of IS research is its emphasis on multidisciplinary collaboration and teamwork. The IS track increases scholars' exposure to and contact with a broad spectrum of UCSF faculty conducting IS research — an important step in developing a research network that scholars can call upon throughout their careers.

Students completing the track must complete Introduction to Implementation Science: Theory and Design (IMPLMT SCI 245) and two additional ImS electives. Students may not take more than 3 ImS courses as part of the MS program. Students can take ImS coursework in year 1 or year 2. Several ImS courses are impacted and have limited enrollment.

Priority is given to MS year 2 students who have committed to the ImS track.