

## MD Degree with MAS Degree in Clinical Research

### Rationale

The Master of Advanced Study (MAS) Degree Program in Clinical Research, administered by the UCSF Training in Clinical Research (TICR) Program in the Department of Epidemiology and Biostatistics, provides rigorous and contemporary instruction in the methods of clinical research, epidemiology and biostatistics. Clinical professionals with deep subject matter knowledge (e.g., physicians) who desire to perform research in their careers are a primary target audience. Traditionally, clinical professionals have enrolled in programs like the MAS *after* their formative clinical training (i.e., during their post-residency fellowship training or as junior faculty members). The rationale for this sequence is largely historical, owing to availability of funding options. While this sequence is optimal for some learners, obtaining research training concurrent with clinical training is increasingly being viewed as better for others. Compared to later in their careers, students in their undergraduate medical training are often better able to absorb the methods of clinical research because they are still highly engaged in classroom learning and less distracted by other professional and personal obligations. Indeed, it is likely that some students who are capable of becoming talented investigators never reach their potential because they become overwhelmed by what amounts to an entire new set of training requirements (for clinical research) several years after their last training (in their clinical discipline), often when they are facing mounting clinical responsibilities, education-related debt, and desires to start families. This view is shared by the NIH which has recently offered several funding opportunities that sponsor degree-based clinical research training during medical school. With this background, leaders from the UCSF School of Medicine (SOM) and MAS Program now seek to further encourage clinical research training concurrent with medical school training by development of a more easily accessed MD and MAS Degree training sequence.

### History

The MAS Degree Program in Clinical Research was initially conceived as a minimum two academic year (7 quarters: 4 quarters in year 1 and 3 quarters in year 2) program, tailored towards clinical professionals (e.g., physicians, nurses, dentists, and pharmacists) who desire to have clinical research be a prominent part of their careers. The program enrolled its first class in 2002, graduated its first class in 2004, and, for the past decade, has graduated 20-25 students annually. Consistent with national norms, the earliest cohorts were comprised of students who had finished their formative clinical training (i.e., completed professional school, residency, and clinical fellowship training) and were either at the end of their post-residency fellowship or were junior faculty members. In the late 2000's, medical students both within and outside of UCSF became interested in the program, typically as a more relevant alternative to the MPH degree, which has had a long history of being undertaken concurrently with professional school. These initial medical students interrupted their professional school training by stepping away for two academic years and enrolling in the MAS Degree Program before returning to medical school. While these inaugural students thrived academically in the MAS Program, most medical students who considered this route were disenchanted by two extra years of school and tuition.

To facilitate more interest among medical students, leaders from the UCSF SOM and the MAS Degree Program in 2013 agreed upon a program of study whereby medical students could complete both the MAS degree and MD Degree in 5 years. This was primarily achieved by allowing the medical students to complete the MAS Program in 6 quarters (instead of the standard 7). There were no changes in substantive course, credit or capstone requirements for the medical students; they were simply allowed to take one less quarter-long work-in-progress seminar, which was more than compensated for by taking another unit of methodologic-oriented coursework. The other critical structural breakthrough which allowed medical students to complete both degrees in 5 years was that the SOM developed clinical experiences for the students (one-half day each week) which fulfilled their longitudinal ambulatory care requirements. This structural development, however, also proved to be the rate-limiting factor in how many students could enroll in the program. Only two such slots were created each year, and these two slots were consistently filled. Other students who sought MAS training could still take two full years away from medical school but none chose this route after 2013.

Fortunately, the School of Medicine's new Bridges curriculum ([meded.ucsf.edu/bridges](http://meded.ucsf.edu/bridges)) has broken the structural logjam that had impeded more medical students from enrolling in the MAS Program. Bridges represents a new paradigm in professional training, with the goal of creating physicians for the current and future mega-information era. One of the main objectives is to imbue students with the spirit and skills of *inquiry*. While inquiry may be defined in several domains, one prominent area in which inquiry is being

featured in Bridges is the sphere of clinical research. In practice, SOM will be enrolling more students interested in clinical research, more formally espousing the principles of clinical research in the first two years of coursework, and encouraging more students to enroll in dedicated degree programs that focus in depth on the methods of clinical research. In short, an expected by product of Bridges is more medical students interested in obtaining the MAS Degree in Clinical Research. Finally, because Bridges promotes learning about inquiry through extra-medical school degree programs (like the MAS), it has ample elective time to accommodate this and has eliminated any restrictions in the number of students who can enroll in the MAS.

## Proposal

Beginning in Fall 2016, the SOM Bridges curriculum adopted the following structure:

Quarter	Year 1	Year 2	Year 3	Year 4
Summer 2	Launch	Vacation/Inquiry	Foundations 2: Block 4	Career Launch: Block 5
Fall	QC IDS 121A Ground School CMC	QC IDS 122A Life Stages CMC	ARCH 6	ARCH 8
	IDS 121A ARCH 1		Foundations 2: Block 5	Career Launch: Block 6
	QC IDS 121B ABC 1 CMC	QC IDS 122B BMB CMC	Foundations 2: Block 6	Career Launch: Block 7
	QC IDS 121B H&I CMC			Career Launch: Block 8
	QC IDS 121B ABC 2 CMC	IDS 122B ARCH 4		Career Launch: Block 9
	IDS 121B ARCH 2	Vacation	Winter Break	Winter Break
Winter	Winter Break	Winter Break		Career Launch: Block 10
	IDS 123A Inquiry Immersion	Foundations 2: Block 1		Career Launch: Block 11
	QC IDS 121C REGN CMC	Foundations 2: Block 2	Licensing Exams	Career Launch: Block 12
	QC IDS 121C H&S CMC		Inquiry Immersion/ Intersessions	Career Launch: Block 13
Spring	IDS 121C ARCH 3	Longitudinal FCM 110/FS-In-F2 Days	Career Launch: Block 1	
	Vacation	ARCH 5	ARCH 7	
Summer 1	QC IDS 121D PHD CMC	Foundations 2: Block 3	Career Launch: Block 2	
	Vacation/Inquiry	Foundations 2: Block 4	Career Launch: Block 3	
		Longitudinal FCM 110/FS-In-F2 Days	Career Launch: Block 4	Coda

**Legend:** ABC, Airway, Blood & Circulation; ARCH, Assessment, Reflection, Coaching & Health; BMB, Brain, Movement & Behavior; CIC, Core Inquiry Curriculum; CMC, Clinical Microsystems Clerkship; DR, Diagnostic Reasoning; F1, Foundations 1; H&I, Health & the Individual; H&S, Health and Society; IDS, Interdepartmental Studies; PHD, Pathogens and Host Defenses; REGN, Regulation, Endocrine, GI & Nutrition; IS, Intersessions

Beginning in Summer 2 Quarter 2019, the first cohort of medical students in the Bridges Curriculum will reach the point between their third and fourth year of medical school. At this time, we propose that selected students will embark on a temporary leave from the SOM and begin the MAS Degree Program in Clinical Research. These students will need to apply to the MAS Program by the mid-March deadline and undergo the same admission procedures as all other applicants. Students accepted into the MAS Program will take the following curriculum (6 quarters of the MAS Program are in yellow):

Quarter	Year 1	Year 2	Year 3	Year 4	Year 5
Summer 2	Launch IDS 121A Ground School CMC CIC	Vacation/Inquiry IDS 122A Life Stages CMC CIC	Foundations 2: Block 4 ARCH 6	MAS Summer I EPI 201 EPI 202 EPI 218 BIOSTAT 212	Career Launch Block 6 ARCH 7 Break
Fall	IDS 121A ARCH 1 IDS 121B ABC 1 CMC CIC IDS 121B H&I CMC CIC IDS 121B ABC 2 CMC CIC IDS 121B ARCH 2 Winter Break IDS 123A Inquiry Immersion	IDS 122B BMB CMC CIC IDS 122B ARCH 4 Vacation IDS 122C DR CMC CIC Winter Break	Foundations 2: Block 5 Foundations 2: Block 6 Winter Break	MAS Fall I EPI 203 EPI 204 EPI 220 BIOSTAT 200	MAS Fall II EPI 221 BIOSTAT 210 Electives Research
Winter	IDS 121C REGN CMC CIC IDS 121C H&S CMC CIC IDS 121C ARCH 3 Vacation	Foundations 2: Block 1 Foundations 2: Block 2 ARCH 5 Foundations 2: Block 3 Foundations 2: Block 4 Longitudinal FCM 110/FS-in-F2 Days	Licensing Exams Inquiry Immersion/Intersessions Career Launch: Block 1 ARCH 7 Career Launch: Block 2 Career Launch: Block 3 Career Launch: Block 4	MAS Winter I EPI 205 EPI 220 BIOSTAT 208 Electives Research	MAS Winter II EPI 221 Electives Research
Spring	IDS 121D PHD CMC CIC Vacation/Inquiry	Longitudinal FCM 110/FS-in-F2 Days	Break	MAS Spring I EPI 212 EPI 214 EPI 220 BIOSTAT 209 Electives Research	Break Career Launch Block 7 CODA
Summer 1				Break Career Launch Block 5	

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June 11, 2018

Identical to the current agreement between the SOM and MAS Program, medical students who elect this route will have all of the course unit and research requirements as all other MAS Program students. This includes 36 units of coursework in the Graduate Division and three capstone requirements (comprehensive literature review, conference presentation, and first-authored peer-reviewed original research manuscript). No course units or activities that are being performed for the SOM will be used to meet the requirements of the MAS Program. Following completion of their 6<sup>th</sup> quarter in the MAS Program in Winter Quarter of Year 5, students will return to the SOM for their final Spring Quarter.