



Mary Gauvain
Telephone: (510) 987-0887
Email: mary.gauvain@ucop.edu

Chair of the Assembly of the Academic Senate
Faculty Representative to the Regents
University of California
1111 Franklin Street, 12th Floor
Oakland, California 94607-5200

July 28, 2021

MICHAEL T. BROWN
PROVOST AND EXECUTIVE VICE PRESIDENT
UNIVERSITY OF CALIFORNIA

Re: Approval of UCLA Master of Applied Chemical Sciences

Dear Michael,

In accordance with the *Universitywide Review Processes For Academic Programs, Units, and Research Units* (the "Compendium"), and on the recommendation of CCGA, the Academic Council has approved UC Los Angeles' proposal to establish a Master of Applied Chemical Sciences self-supporting graduate and professional degree program (SSGPDP).

Because this is a new degree title, and the Assembly of the Academic Senate is not meeting within 30 days of CCGA's approval, Council must approve the program per Senate Bylaw 125.B.7.

I am enclosing CCGA's report on its review of the new program, and respectfully request that your office complete the process of obtaining the President's approval.

Sincerely,

A handwritten signature in cursive script that reads "Mary Gauvain".

Mary Gauvain, Chair
Academic Council

cc: Academic Council
UCLA Senate Director de Stefano
IRAP Analyst Procello

**COORDINATING COMMITTEE ON GRADUATE AFFAIRS (CCGA)**

Amr El Abbadi, Chair
amr@cs.ucsb.edu

ACADEMIC SENATE

University of California
1111 Franklin Street, 12th Floor
Oakland, California 94607-5200

July 9, 2021

ACADEMIC COUNCIL CHAIR MARY GAUVAIN

Dear Chair Gauvain:

At its July 7 meeting, the Coordinating Committee on Graduate Affairs (CCGA) voted 8-0-2 to approve a proposal from the UCLA campus for a Master of Applied Chemical Sciences (MACS) self-supporting graduate degree proposal.

The MACS program prepares students for careers in two major fields of applied chemical sciences, medicinal chemistry and materials chemistry, and will have two tracks, each associated with one of the fields. The overall goal of the proposed master's program is to train well-rounded chemists who are equipped with a broad level of critical skills and the necessary knowledge of applied chemistry to be highly competitive in a non-academic workforce. The concept for a professional program is new in the fields of chemistry and biochemistry, and is inspired by the Japanese model, in which students who want a degree beyond a B.Sc. enroll in a two-year Master's program in order to pursue research and management in a corporate sector, while students who are interested in academic careers enroll in a Ph.D. program.

The program requires at least 72 units, as will 11 specific courses (three of these being laboratory-based) and a capstone project (an internship in conjunction with the capstone will be encouraged). Six of the courses will be created for the MACS degree, but will also be available to undergraduate students and graduate students not in the MACS program. The other courses currently are in existence. The capstone project will be a team effort (2-3 students per project) carried out in the laboratory of an approved UCLA principal investigator, a MACS-related organization (i.e., industrial partner, as an internship) as approved by the MACS Program Director, or a combination of the two. The internship will be recommended but not required. The capstone will culminate in a public group presentation and an individual oral exam administered by a thesis committee.

The three reviewers were uniformly enthusiastic about the program. They felt that the quality of the academic rigor of the program was high and that the size and expertise of faculty administering the program was excellent. The reviewers did raise some concerns, which were addressed in full by the proposers. CCGA was satisfied with the responses and supports its approval.

The MACS program will use a portion of its profit to finance scholarships to recruit and retain a diverse student body. Ten percent of the annual revenue will be allocated to financial aid, which represents two full scholarships each year.

As you know, CCGA's approval is the last stop of the Academic Senate side of the Systemwide review and approval process except when the new degree title must be approved by the Academic Council. I submit this for your review and have enclosed the Lead Reviewer's report. Please do not hesitate to contact me if you have further questions regarding the proposal.

Sincerely,

A handwritten signature in black ink that reads "Amr El Abbadi". The signature is written in a cursive, slightly slanted style.

Amr El Abbadi
CCGA Chair

cc: Robert Horwitz, Academic Senate Vice Chair
CCGA Members
Hilary Baxter, Academic Senate Executive Director
Michael LaBriola, Academic Senate Assistant Director
Chris Procello, Academic Planning and Research Analyst
Susan Ettner, UCLA Graduate Dean
April de Stefano, UCLA Senate Executive Director
Estrella Arciba, UCLA Senate Analyst



PARTHO GHOSH
PROFESSOR
DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
UNIVERSITY OF CALIFORNIA, SAN DIEGO

9500 GILMAN DRIVE
LA JOLLA, CALIFORNIA 92093-0358
EMAIL: PGHOSH@UCSD.EDU
PGHOSH.UCSD.EDU

TO: CCGA

FROM: Partho Ghosh, Lead Reviewer

DATE: 7 July 2021

RE: Review of UCLA Master of Applied Chemical Sciences (MACS) Self-Supporting Graduate Professional Degree Program

Description of the Program

The proposal is for a two-year, full-time, self-supported Master of Applied Chemical Sciences (MACS) degree at UCLA. Professional degrees in chemistry or biochemistry are rare, and the program takes its lead from a Japanese model, in which students take a two-year Master's program to gain skills appropriate to pursuing both research and management in the corporate sector.

The MACS program will be housed in the Department of Chemistry & Biochemistry, and have two major tracks: Medicinal Chemistry (pharmaceuticals, biotechnology, agrochemicals, medical diagnostics) and Materials Chemistry (electronic materials, polymers, and petrochemicals). Overall, 72 units will be required, as will 11 specific courses (three of these being laboratory-based) and a capstone project (an internship in conjunction with the capstone will be encouraged). Six of the courses will be created for the MACS degree, but will also be available to undergraduate students and graduate students not in the MACS program. The other courses currently are in existence. The capstone project will be a team effort (2-3 students per project) carried out in the laboratory of an approved UCLA principal investigator, a MACS-related organization (i.e., industrial partner, as an internship) as approved by the MACS Program Director, or a combination of the two. The internship will be recommended but not required. The capstone will culminate in a public group presentation and an individual oral exam administered by a thesis committee. At least 72 units will be required. .

The program expects to have 20 students initially and 25 students in year 3, for a total of 50 students in any one year. The initial cost to the students will be \$35,000 per year with a projected 3% increase per year. The program expects to be self-supporting by year 3.

Overall Opinion of the Reviewers

Four external reviewers, two from UC and two from outside UC, were solicited for critiques. Three provided critiques (two from UC and one from outside), and a fourth stopped responding.

Reviewers:

- A. Omar Farha, Northwestern University, Department of Chemistry, Professor (Suggested by Proposers)
- B. Craig Martens, University of California, Irvine, Department of Chemistry, Professor and Vice Chair for Graduate Affairs
- C. Thomas Hermann, University of California, San Diego, Department of Chemistry and Biochemistry, Professor and Associate Dean for Education and Students, Division of Physical Sciences

The three reviewers were uniformly enthusiastic about the program (A, “I believe the proposed program is timely and needed; B, “thoughtful, carefully prepared, thoroughly researched, and well-written proposal”, C, “an overall outstanding and convincing effort to create a new degree program that creates value for chemistry students who aspire to quality career paths in industry while benefiting from a shortened time to degree without sacrificing a credible component of individual research experience”). While reviewer B was supportive, this reviewer brought up some concerns and stated that they were not convinced that the program would work as intended but that it was “an experiment that is worth conducting.” Reviewer B’s two concerns had to do with diversity and the capstone project. These concerns were conveyed to the proposers, who responded to this issues raised by reviewer B. These concerns and responses are detailed below.

Quality and academic rigor of the program

The reviewers all thought that the quality of the academic rigor of the program was high. Reviewer A noted that the new laboratory and career networking courses are “extremely impressive” and fill an existing gap in education. Reviewer A also thought the capstone project was a strong feature of the program.

However, reviewer B raised a number of specific issues about the capstone project, which were centered on the possibility that the capstone projects would not be appealing to UCLA faculty members to initiate and supervise. The proposers responded in full to these issues, and noted that faculty members already collaborate with industrial partners and are “cognizant of the nature of applied research projects.”

Adequacy of the size and expertise of faculty to administer the program

The reviewers all thought the size and expertise of faculty administering the program was excellent.

Adequacy of the facilities and budgets

Reviewers A and C thought the facilities and budgets were outstanding. Reviewer C noted that this was especially so, since \$2 million has been expended to upgrade existing laboratory equipment and facilities, and MACS students will be the prime users of the upgraded equipment and facilities.

Reviewer B was enthusiastic about the facilities but brought up some questions about the budget, and in particular the overload teaching by faculty and target enrollments. The reviewer suggested that MACS course be taught as part of the regular curriculum rather than with faculty receiving additional compensation due to overload teaching, and that the tuition be lowered to ensure

target enrollments are met. As the reviewer themselves noted, “I suspect these issues are not particular to the MACS, but are common to many of the SSPs proposed in the UC System.”

The report by UCPB was supportive of the program, but also noted the proposal was unclear about how the additional compensation to faculty for teaching existing courses accords with APM 662-16. Presumably this issue will be addressed at the three-year review of the program.

Plan to support state mission

New courses for the MACS program will be available to undergraduate and graduate students outside of the program. In addition, the existing laboratory equipment and facilities that has been upgraded with \$2 million worth of funds will also be available to these students outside of the MACS program. Revenue from the program will be used to maintain the laboratory equipment and facilities. Reviewer A noted that this was a significant benefit of the program.

Applicant pool and placement prospects for the graduates

The proposers envision two applicant pools — recent graduates and working professionals. Reviewers B and C both commented on the need in the workforce for the sorts of graduates that this program will produce, and Reviewer C commented that the MACS program “will attract a sizeable and strong pool of applicants.” Reviewer C noted that the proposed tracks in medicinal chemistry and materials chemistry are “well chosen to address a large volume of contemporary recruitment demand,” and they also commended the proposed plan for a regular a review of the specialization tracks to adapt to trends in the labor market.

The placement prospects were noted to be excellent by Reviewer C, based on this reviewer’s prior experience in industry and more recently in working with industry representatives, recruiters, and alumni.

Diversity

The MACS program will use a portion of its profit to finance scholarships to recruit and retain a diverse student body. Ten percent of the annual revenue will be allocated to financial aid, which represents two full scholarships each year.

Reviewers A and C were satisfied with the diversity plan, while reviewer B was concerned that the program was not inclusive. This reviewer raised the issue that a terminal Master’s in Chemistry is essentially cost-free to students, in comparison to the \$35,000 per year cost of the MACS program. It must be noted, however, that a terminal Master’s is not equivalent to the proposed MACS degree.

The proposers responded in full to these concerns. They noted six points:

1. 10% of MACS income will be returned to students in the form of financial aid, with the possibility that this amount will increase after the first three years.
2. MACS students will be eligible for partial TA-ships for undergraduate courses, and there are a large number of TA-ship opportunities.
3. MACS students will be eligible for graduate student research positions, although the number of these is not predictable.

4. MACS students are eligible for the UCLA Graduate Opportunity Fellowship Program, which is limited to entering students pursuing terminal or professional master's degrees.
5. MACS students are eligible for work-study programs.
6. There are plans to try to endow scholarships for the MACS program through external funds.

Discussion at CCGA Meeting

It was suggested that the term "Thesis Committee" is inappropriate since there is no thesis component of the program. It was also suggested that the term "essential skills" is preferable to "soft skills."

Conclusions

The reviewers are uniformly supportive of implementation of the Master of Applied Chemical Sciences (MACS) Self-Supporting Graduate Professional Degree Program, and I recommend approval.