Masters of Mathematics with Teaching Credential

Michael Fried: Chair, 949-824-6592

The program of study consists of a genuine Mathematics Masters Degree with a teaching credential. The program is for students who wish to be middle school or high school teachers after their Mathematics training. Admission to this program assumes a student has completed a Bachelor's degree in a Physical Sciences discipline: Mathematics, Physics or Chemistry.

This is a rigorous two year program, with several options. A highly motivated student can complete the program with guidance from the Mathematics Graduate Advisor and an academic counselor in the Department of Education.

There are two options to complete the Master's portion of the program: **Plan I – Thesis** and **Plan II – Comprehensive Examination**. Each option requires the student complete twelve quarter courses in the Mathematical Sciences, most from the *Mathematics Department*, and 40 quarter hours of teacher preparation work in the *Education Department*. The *Education Department* also will provide guidance for *supervised teaching* and for *methodology* courses (below). Advisors for the program will allow flexible adjustments to the options. For example, a Statistics version of the program might change the core courses slightly, and adjust the options suitably. The Graduate Studies Committee will tailor such a curriculum for any student in the program, guaranteeing the usual high standards of the program.

Core courses for the Masters of Mathematics: The Core comes from six courses (24 units):

- Math 210 A-B-C—Real Analysis

- Math 220 A-B-C—Complex Analysis

- Math 230 A-B-C—Algebra

For a pure mathematics based program a student would probably choose the 220 and 230 sequences. A student motivated in the applied direction might choose the 210 and 220 sequences. Still, because of the significance of algebra in the High School curriculum, advisors highly recommend the 230 sequence to all students. While many of the concepts are abstract, they relate to the challenges experienced in teaching the present High School curriculum.

Plan I – Thesis: This option includes nine regular courses, six from the core course list plus three *Thesis* courses. In addition, the Graduate Studies committee must approve the thesis project (see UCI General Catalog). It will appoint a *Thesis Committee* according to the procedures of the Graduate Division. The student is responsible for putting together a committee for an oral thesis defense exam when s/he has prepared a Thesis. Before this oral defense of the thesis, the student must pass *one* of the core exams in Algebra, Real Analysis or Complex Analysis.

Plan II – Comprehensive Exam: This option requires twelve courses. At least eight of the twelve, hence two out of the optional courses, must be graduate courses. Students in this option take the *comprehensive exams*, as do regular Master's program students. These consist of two exams from the core exam areas in Algebra, Real Analysis or Complex Analysis. The exams occur twice a year, in the spring and prior to the start of the fall quarter. The Graduate Studies Committee appoints a committee to grade these. It will make final decisions on passing or failing in a meeting open to all of the faculty.

The *Mathematics Department*'s *Graduate Studies Committee* must approve the student's optional courses. The following non-inclusive list gives possible optional courses.

◇ Math 150 Introduction to Mathematical Logic

1

◇ Math 151 Set Theory

◇ Math 152 Computability

◇ Math 162A/B Differential Geometry

◇ Math 180 Introduction to Number Theory

◇ Math 184 History of Mathematics

◇ Math 201A Mathematical Statistics

◇ Math 201B Linear Regression Analysis

Other upper division Mathematics, Physics, Chemistry or Computer Science courses may also be appropriate. Example: Physics 111 – classical mechanics and 116 – thermodynamics.

Teaching Credentials: The State of California issues these upon recommendation by an institution of higher education. The *Education Department* is responsible for implementing the Teacher Credential portion of this program. It will recommend the candidate to the state for credentialing upon successful completion of the following requirements:

- Passage of the CBEST exam

- Passage of the SSAT and Praxis exams in Mathematics

- Certificate of Clearance

- Negative TBtest results

- Satisfaction of the US Constitution requirement

- Successful completion of all required course work/student teaching

- Complete application for the Commission on Teacher Credentialing

Coursework for the preliminary teaching credential: Application to the Commission on Teacher Credentialing requires official transcripts and a $60 money order. The state credentialing board requires all the following courses or their equivalent. The following must be in the *Education Department*. By agreement with the *Education Department*, a teacher credential candidate may substitute partial credit for those with an * by being a participant in the UCI Summer Mathematics Institute.

- Educ 101 Secondary school curriculum and organization

- Educ 102F Methods of Teaching Mathematics in secondary schools*

- Educ 102H Applied Instructional Strategies

- Educ 105B Reading & Writing in middle/high school classrooms

- Educ 124 Multicultural Education in K-12 schools

- Educ 165 Theories and Research on 1st and 2nd Language Acquisition

- Educ 166 Methodology of Bilingual English Language Development

- Educ 167 Practicum in Cultural Studies

- Educ 173 Learning theory and classroom practices

- Educ 174 Observation & Literacy Assessment in Diverse Schools

- Educ 302A/LA Instructional Technology: Resources for the Single Subject Classroom*

- Educ 320 A-E Supervised Teaching in the Secondary Schools

Computer Consultant Kim Burge of the *Education Department* and the *Mathematics Department* head of the Summer Mathematics Institute (Larry Chrystal) meet yearly to assess requirements for 302A/LA. Students become knowledgeable about computer software, hardware, web design, e-mail strategies and ethics.

The State Department of Education declares certain courses as: *to clear credential*. This means the student has five years from completing a teacher credential degree to take these courses:

- Educ 162 – Psychology and education of the exceptional child (mainstreaming)

- Educ 380 – Health education for teachers

Supervised Teaching: Teacher credentialing requires an internship period before the state can regard a student as *classroom ready*. This requires twenty quarter hours for the single subject credentialing program. A student can fulfill this by student teaching in a middle school or high school for the winter and spring quarters. A student who is a TA in the *Mathematics Department* would get six hours toward this requirement for time spent teaching under the TA-ship. Additional hours would be given for teaching the *Young Mathematicians* from the UCI Summer Mathematics Institute related activities.

Supervised Teaching is an essential component of the preparation of a classroom ready teacher. The substitutions above will be closely monitored to ensure they qualify for quality classroom preparation. The quality of this program ties closely to the quality of the students who have the honor of a TA-ship in the *Mathematics Department*. Therefore, the Masters Program coordinators will make every effort to accommodate the time constraints of a TA.

Incentives to be in the program: Administrators in the Schools are avid to have Math/Science people. There may be money incentives for coming into this program. One example is the *Governor's Teacher Scholarship*. This UC-funded repayable scholarship program is for students accepted to a two-year UCI graduate program that results in a master's degree and teaching credential. Participants must make a four-year commitment to teach in the public schools in a designated low-income school. The scholarship recipient will have all university registration fees paid for the duration of the master's/credential program (up to five quarters). The *Education Department* has applications at 2001 Berkeley Place. (Failure to meet all commitments for this scholarship will result in required repayment and penalties.)

Students aiming for a Mathematics credential can benefit from the Assumption Program of Loans for Education (APLE): This state-funded loan assumption program encourages outstanding students to become teachers and serve in designated low-income publics schools or critical teacher shortage areas in the public schools. These include Mathematics, Science, Bilingual Education, Reading Specialist, Special Education. (Note: UCI does not have a Reading Specialist or Special Education credential program.) The conditions are similar to the Governor's program: a four-year commitment to teach in the public schools after receiving a credential. A successful candidate will have up to $11,000 of eligible student loans assumed. Juniors, seniors, and credential candidates should apply. Candidates must submit an application, a copy of undergraduate transcripts, and a personal statement. Information and applications are at the *Education Department*.

Students can go forward for a Ph.D. in Mathematics: For admission to the doctoral program, students must pass all three written qualifying exams in the core areas. These are *real analysis, complex analysis* and *algebra*. These are high skill competency exams (separate from the final exams of the courses). They test just the *first two quarters* of material of any given sequence of core courses. A committee prepares and grades them. (See above.)

Graduate students admitted with a Master's degree in Mathematics from elsewhere must successfully complete these exams within one year. Students admitted as Master's candidates at UCI must complete the exams within two years. There are two levels of Pass for these exams. The lower level allows completion of any Masters's degree. We require the higher level of pass for admission to the PhD program.

Applying for this dual program: The *Mathematics Department* handles admitting students to the dual Masters/Credentialing program. Upon admission, the *Mathematics Department* will forward a copy of your application to the *Education Department.*

Submitting the applications: The application deadline for the Masters Credential Program and the deadline for submitting the *Petition to Begin Education Department* classes for the credential portion are due in the *Education Department* by February 1st before beginning the credential program in the fall.

Entrance exam the *Education Department***:** Students must take the following exam: **C(alifornia)-B(asic)E(ducational)S(kills)T(est)**. The applicant must be aware of the times of the CBEST. They must have the test results available at the proper time during admission.

Administration of the program: The *Mathematics Department* and *Education Department* have a joint committee of faculty members to oversee this Master's program. This *Master's Advice Committee* is responsible for setting up appropriate advisors for the students in the program. Also, this committee is the first resort for changing course offerings in the program.

The following are members of the *Master's Advice Committee* as of Spring 2000. **It is essential that students seek program information from both departments.**

- Professor Michael Fried, Math. Dept: Committee Chair 949-824-6592

- Barbara Noble, Educ. Dept. Academic Counselor 949-824-7465

- Associate Professor Toti Daskalopolis, Math. Dept. Vice-Chair 949-824-5422

- Aurelia Huffman, Educ. Dept. Academic Counselor 949-824-6673

SAMPLE PROGRAM: Plan I – Thesis

YEAR 1:

Fall	Winter	Spring	Summer
Math 220A	Math 220B	Math 220C	UCI Summer Institute
Math 230A	Math 230B	Math 230C	
Math 399A (TA)	Math 399B (TA)	Math 399C (TA)	Educ 124 (on-line)
		Educ 173 (on-line)	

YEAR 2:

Fall	Winter	Spring	Summer
Thesis	Thesis	Thesis	Thesis (if necessary)
Educ 101	Educ 102H	Educ 102H	
Educ 102F	Educ 167*	Educ 320C	
Educ 105B	Educ 302A	Educ 320D	
Educ 165*	Educ 302LA	Educ 320E	
Educ 166*	Educ 320A	Math 399C (TA)	
Educ 174	Educ 320B		
Math 399A	Math 399B		

SAMPLE PROGRAM: Plan II – Comprehensive Exam[†]

YEAR 1:

Fall	Winter	Spring	Summer
Math 150	Math 151	Math 152	UCI Summer Institute
Math 210A	Math 210B	Math 210C	Educ 124 (on-line)
Math 220A	Math 220B	Math 220C	
Math 230A	Math 230B	Math 230C	Comprehensive Exams

Educ 173 (on-line)

YEAR 2:

Fall	*Winter*	*Spring*	*Summer*
Educ 101	Educ 102H	Educ 102H	Comprehensive Exams
Educ 102F	Educ 167*	Educ 320C	
Educ 105B	Educ 302A	Educ 320D	
Educ 165*	Educ 302LA	Educ 320E	
Educ 166*	Educ 320A	Math 399C (TA)	
Educ 174	Educ 320B		
Math 399A (TA)	Math 399B (TA)		

* These classes are required for the Crosscultural, Language and Academic Development (CLAD) program. Coursework for these classes will begin in the beginning of September.

† The responsibility of a teaching assistant and the hours required for this position makes it almost impossible to complete Plan II in a two year period. It the student chooses to participate as a TA, the student should plan addtional time to complete this dual program.