

PROPOSAL TO CHANGE THE ACADEMIC MASTER PLAN

Proposed Name of Degree: Master of Science in Mathematics

Faculty Proposing New Program: Ivona Grzegorzcyk, Jorge Garcia, Jesse Elliot,
Peter Smith, William Wolfe, Geoff Dougherty

Review and Approval:

Date of Proposal: Nov 1,03_____

Date of Faculty Meeting: Spring 04_____

Date of Consultation with Academic Affairs: Spring 04_____

1. Curriculum Committee Approval:

Curriculum Chair: _____ Date: _____

2. Academic Senate Approval:

Chair, Academic Senate: _____ Date: _____

3. Administration Approval:

President (or designee): _____ Date: _____

1. Definition of the Proposed Degree Major Program

a. Name of the proposed degree major program, and academic year of intended implementation.

California State University Channel Islands,
Masters of Science in Mathematics.

This and MS in Mathematics degree program is a result of cooperation between Mathematics and Computer Science faculty. **All** of the courses are shared between the two departments and students' specializations depend on the final project/thesis and the electives chosen under the supervision of their Mathematics advisors.

MS in Mathematics will be offered initially through the Open University (the Extended Education Program) in Fall 2005.

b. Name of the department, departments, division or other unit of the campus that would offer the proposed degree major program. Identify the unit that will have primary responsibility.

Mathematics Department will have the primary responsibility for Master of Science in Mathematics degree program.

c. Name, title, and rank of the individual(s) primarily responsible for drafting the proposed degree major program.

Ivona Grzegorzcyk, Professor of Mathematics
Jorge Garcia, Assistant Professor of Mathematics
Jesse Elliot, Assistant Professor of Mathematics
William Wolfe, Associate Professor of Computer Science
Peter Smith, Professor of Computer Science
AJ Bieszczad, Lecturer of Computer Science
Geoff Dougherty, Professor of Physics

d. Objectives of the proposed degree major program.

General Objectives:

1. Provide students with the opportunity to earn a Master degree in Mathematics from the California State University.
2. Prepare students for employment in a variety of highly sophisticated and complex high-tech and bio-tech industries, finance, businesses, education systems, military and local and federal government
3. Prepare students for further study in graduate or professional schools.
4. Equip students with the depth, flexibility and computational skills that apply to variety of fields and offer various career opportunities, including consulting, scientific and technical positions in business and industry, research and development, national and industrial security or teaching positions.

5. Offer all CSUCI students the opportunity to broaden their knowledge and learn computational skills that can be applied to various professional and personal situations.

Learning Objectives:

Students will:

1. Demonstrate critical thinking, problem solving, and advanced computational skills by identifying, evaluating, analyzing, synthesizing and presenting fundamental and advanced mathematical and computer science issues and their applications.
2. Demonstrate the knowledge of current computing practices and broad technology use in industry and education, including a working knowledge of software development techniques in various settings.
3. Be knowledgeable of emerging new technologies and industrial practices connected to the computer industry and demonstrate understanding of computing technologies in society.
4. Demonstrate cooperation skills by working effectively with others in interdisciplinary group settings – both inside and outside the classroom.
5. Demonstrate independent working and thinking skills by completing a graduate project and/or master thesis.
6. Demonstrate a sense of exploration that enables them to pursue rewarding careers in high-tech industries, bio-tech industries, finance, businesses, education systems, military and local and federal government
7. Demonstrate flexibility, transferability and adaptability of their life-learning skills that are so important in a fast changing national and international economy.

2. Justification for the Proposed Degree Major Program

- a. **List of other California State University campuses currently offering or projecting the proposed degree major program; list of neighboring institutions, public and private, currently offering the proposed degree major program.**

Most other CSU campuses offer a Master of Science in MS in Mathematics or Applied Mathematics. However, three nearby private institutions (California Lutheran, Pepperdine, Westmont) do not offer these degrees.

- b. **Differences between the proposed program and programs listed in Section 2a above.**

-The CSUCI'S MS in Mathematics degree is designed for students in the local service area – and will offer access to a highly desired high-tech and educational positions in a unique program that stresses an interdisciplinary learning approach.
- This degree program is a result of cooperation between Mathematics and Computer Science faculty and stresses modern, scientific approach through mathematical analysis of underlying ideas.

- The program is designed to reflect rapidly changing needs of the computational industries and the related sophisticated applications (for example in bioinformatics, data mining, computer graphics, internet development, security issues and mathematics education).

- The program provides local industry related projects and internships with the local high–tech companies and businesses. (We have good relationships with several companies, and our undergraduate students are already placed in internship positions).

c. Professional uses of the proposed degree major program.

The Master of Science in Mathematics will prepare students for a variety of computational, statistical, data management industrial positions and college level teaching professions. The degree would also prepare students for further graduate education in mathematical sciences.

d. Community/Regional/Statewide need for the proposed program.

1. Due to the rapid growth of information sciences based industries nationally and locally, there is a tremendous need for people with advanced technological and computational degrees. Many new positions will need to be filled within the next 5 years, with far more anticipated needs for the coming decade. By federal national estimates, in the next decade the number of mathematics and CS related industries will be the fastest growing sector in US economy, especially in the technology-oriented state of California.
2. Current national security needs created many state and federally founded positions for people with graduate computational degrees (Note: NSA is the largest employer of mathematicians in the world).
3. Locally, CSUCI is located in the center of the high-tech corridor in the Ventura County and near several military bases, that have high need for employees with advanced computational skills. Due to the high cost of living in Ventura County, the companies are looking for local talents with graduate degrees.
4. Regionally, CSUCI is one of the CSU campuses within Southern California, which has the largest clusters of high-tech, military and national security services. All high-tech companies are experiencing a severe shortage of people with computational skills, including this region.
5. The program is interdisciplinary in nature and will strengthen and enhance offerings of all existing programs. Due to the strong background in computer science and mathematics our graduates will be able to fill positions related to information sciences and data management.

6. Mathematics Department has a waiting list of students planning to enroll in the proposed graduate program once it is open. The list includes our own graduates and professionals from local industries.
 7. The program is expected to generate outside funding in the form of grants and contracts, hence bringing additional resources to the university.
 8. The program is very timely and intellectually inspiring for faculty members and the local community interested in new research areas. The program will bring prestige and recognition to CSUCI locally and nationally.
- e. **The expected number of majors in the year of initiation and three years and five years thereafter.**

	<u>Number of Majors*</u>	<u>Number of Graduates*</u>
Initiation Year	20	0
Third year	40	20
Fifth year	100	20

•from CSU Channel Islands Enrollments Models

3. Resources Needs for the Proposed Degree Major Program (faculty, instructional, library, other)

a. Existing.

- Seven tenure/tenure track faculty members with expertise in the proposed mathematics sciences and computer science
- Computer Labs
- On-line services. Since all students are going to be technology literate, some of the courses (or part if the courses) will be offered on-line. This would give the opportunity for local working professionals to participate in the program.
- Some library recourses

b. Future.

- Initially, MS program in Mathematics, it's faculty and staff will be supported by the CSUCI Extended Education office.
- Additional library resources will be required.