A number of past students from CSUEB currently hold positions in California as community college teachers. Others have continued their studies at doctorate-granting institutions and are now university professors. Still others are in mathematics-related careers in industry.

## 2 Mathematics at Cal State East Bay

The Mathematics and Computer Science Department is a large and flourishing department, offering a variety of courses at a variety of times. There are over 30 full-time faculty members, with a wide range of backgrounds and interests. The Department offers more than 50 undergraduate mathematics courses, and about 20 graduate courses.

It offers three different Options leading to a Master’s Degree (M.S.) in mathematics. Option I emphasizes coursework drawn from fundamental branches of mathematics: algebra, topology, and real and complex analysis. Option II is intended for those who hold secondary teaching credentials and who intend to pursue a career in secondary education. It is called the M.A.T.H. program - Mathematics And Teaching (formerly Hayward) CSUEB. Option III is designed to expose students to various aspects of applied mathematics, while allowing some coursework in “pure” mathematics as well. Students in Options I and III may become community college teachers, may go on to further graduate study, or may seek employment in industry. Option II is designed for the professional development of high school teachers interested in learning more mathematics. Option II is not appropriate for those interested in teaching at the community college level.

Many students at the University are working and attending school only evenings or part-time, and the Department and University pays special attention to their needs. Most graduate classes are offered in the late afternoon or evening.

Departmental computing equipment includes a number of advanced workstations including Sun SPARCstations and numerous PC workstations. Laboratories include a graphics laboratory, digital and microprocessor laboratories, a network laboratory, and symbolic mathematics laboratory. In addition, the university centrally provides open computing access for students and provides a number of open computing laboratories which include PC, Macintosh, and Sun workstations. There is also access to supercomputers through the CSU system.

## 1 Graduate Mathematics

CSU East Bay offers a Master of Science degree program in Mathematics. This program offers students the opportunity to extend their knowledge beyond the undergraduate level. It can prepare them for interesting careers, or for further study that requires a background in advanced mathematics.
3 Financial Aid

Financial aid (loans, grants, work-study) based on need is available through the university. Also, both the Department and the School of Science offer merit scholarships.

A number of teaching assistantships are available each quarter to qualified graduate students. These positions involve teaching sections of some elementary mathematics courses. It is also possible to be paid as a reader for an undergraduate mathematics course.

4 Admission Requirements

General CSU East Bay admission requirements for graduate study state that a student must have (1) completed a four-year college course of study and hold an acceptable baccalaureate degree from an institution accredited by a regional accrediting association, or shall have completed equivalent academic preparation as determined by appropriate campus authorities; (2) be in good academic standing at the last college or university attended; (3) have attained a GPA of 2.5 or better in the last 90 quarter (60 semester) units attempted; (4) satisfactorily meet the professional, personal, scholastic, and other standards (including qualifying examinations) for graduate study.

Students applying for the Master’s Degree in mathematics are not required to take the Graduate Record Examination (GRE). They may submit GRE scores however, if they wish.

All students whose education was primarily in a language other than English must demonstrate competency in English. The Test of English as a Foreign Language (TOEFL) must be passed with a score of 550 or better.

Admission may be made by the university into one of the following categories:

Post-baccalaureate Unclassified This option is used by students wishing to take classes for personal or professional growth without seeking an M.S. degree. It is also used by students who cannot be admitted to the degree program for various reasons. Any student who meets the general qualifications (previous paragraph) may be admitted as Post-baccalaureate Unclassified. Only 13 units taken as post-baccalaureate unclassified may be used toward a graduate degree. For this reason, students who plan to work for the M.S. degree should seek admittance in classified or conditionally classified status as soon as possible.

Graduate Conditionally Classified Such students are missing a few of the Department requirements for admission (see individual options), but the Graduate Committee feels that they will be able to make up the deficiencies. Students who are admitted under this classification should make up deficiencies as soon as possible. No more than 20 quarter units taken under this classification may be applied to the degree.

Graduate Classified Students who meet all University and Department requirements (including fulfillment of the University Writing Skills Requirement) for admission to the M.S. program.

5 Advancement to Candidacy

A student must meet these requirements for Advancement to Candidacy.

(1) Classified student in good standing
(2) Completion of at least 12 quarter units of 6000 level courses with at least a 3.0 GPA.
(3) Formal program of study approved by the Graduate Advisor.

All students must demonstrate competency in writing skills in order to receive any degree from CSU East Bay by passing the Writing Skills Test. They must take the test during their first quarter of attendance after being admitted to the program with Conditionally Classified status. The only exceptions are students who have passed the Writing Skills Requirement as undergraduates at CSU East Bay or another CSU campus. Refer to the University Catalog for details about the University Writing Skills Requirement. A student cannot receive Classified Graduate status until the test is passed. More information about the requirement is available in the university catalog.

6 University Requirements for the M.S. Degree

The University requires the following of all Master’s Degree graduates:

(1) Advancement to Candidacy
(2) At least 45 units of work applicable, all earned within five years. Not more than 13 units can be earned while not in residency. Units considered non-resident include those transferred from other universities, those earned through Open University, and those earned as an Unclassified Post-baccalaureate student.
(3) At least a 3.0 GPA in all units used for the degree.
(4) Satisfaction of the University Writing Skills Requirement.

7 Mathematics: Option I

7.1 Admission

To enter the program with Classified Graduate status, a student must have completed at least 36 quarter units of acceptable upper division mathematics with a GPA of B or better. Included among these units must be courses in four areas: analysis, abstract algebra, linear algebra, and differential equations.

A student with course or grade point deficiencies may be admitted to the program with Conditionally Classified status. Units taken to meet these deficiencies cannot be applied toward the M.S. degree, and no more than 20 units taken while in conditionally classified status can be applied toward the degree.

A student with classified status may apply for Advancement to Candidacy after (a) completing at least 16 units toward the M.S. degree with a B or better average (including
at least three\(^1\) 6000-level math courses with a B or better) and (b) having approval of a complete course of study from the Mathematics Graduate Studies Committee.

7.2 Degree Requirements: Option I

The following department requirements for the M.S. degree are in addition to the general University requirements.

**Required Courses** The following four courses (or their equivalents) must be completed, either as an undergraduate or as a graduate student.

- Math 4121 Advanced Algebra
- Math 4340 Introduction to Complex Variables
- Math 4350 Theory of Functions of a Real Variable
- Math 4360 Introduction to Topology

**Other Course Requirements** The 45 units applied to the degree must include:

- 6000-level courses At least 24 quarter units of 6000-level courses, of which at least 20 units are in mathematics. Math 60XX and courses outside of mathematics must be approved by the graduate committee.

**At least two courses** from the following four:

- Math 6121 Topics in Advanced Algebra I
- Math 6201 Topology
- Math 6340 Complex Analysis
- Math 6350 Real Analysis

**Comprehensive Examination** A comprehensive exam must be passed. See Section 10 for further details.

8 Mathematics: Option II

M.A.T.H. Program (Secondary Teaching)

Option II, called M.A.T.H. - Mathematics And Teaching at (formerly Hayward) CSUEB - is for current high school teachers who wish to extend their mathematical knowledge beyond the undergraduate level. This innovative program is responsive to the needs of high school teachers and is informed by current pedagogy and content standards. At the same time, this program is mathematically challenging and rigorous. The teacher who successfully completes M.A.T.H. will be mathematically reinvigorated and will have increased content knowledge in mathematics, broader knowledge of the math teaching resources available to them, familiarity with effective methods of using technology in the classroom, and knowledge of current content standards. The M.A.T.H. courses are also available to students not interested in pursuing a master's at this time. M.A.T.H. is designed for the professional development of high school teachers interested in learning more mathematics. M.A.T.H. is not appropriate for those interested in teaching at the community college level.

8.1 Admission

This option is available only to holders of teaching credentials, unless special permission is obtained. To enter the program with Classified Graduate status, a student must have completed at least 24 units of acceptable upper division mathematics with a GPA of B or better. A student with course or grade point deficiencies may be admitted to the program with Conditionally Classified status.

Units taken to meet these deficiencies cannot be applied toward the M.S. degree, and no more than 20 units taken while in conditionally classified status can be applied toward the degree. A student with Conditionally Classified status who has no course deficiencies, a B or higher average in at least 12 quarter units of post-baccalaureate study, and has satisfied the University Writing Skills requirement, should petition the graduate coordinator for admission to the master's degree program with Classified status.

A student with Classified status may apply for Advancement to Candidacy after (a) completing at least 16 units toward the M.S. degree with a B or better average and (b) having approval of a complete course of study from the Mathematics Graduate Studies Committee.

8.2 Degree Requirements: Option II M.A.T.H.

The following department requirements for Option II of the M.S. degree are in addition to the general University requirements.

**Required Courses** The graduate math core courses for the M.A.T.H. option are listed below. Three of the core courses, Math 6010, 6020, and 6030, present fundamental areas of mathematics found in the high school curriculum from an advanced point of view. The remaining core courses, Math 6040, 6050, and 6060, provide a broader view of mathematics. There are also two required courses offered in the School of Education.

1. **Six M.A.T.H. core courses at 4 units each**
   - Math 6015 Algebra for Teachers
   - Math 6025 Geometry for Teachers
   - Math 6035 Analysis for Teachers
   - Math 6045 Mathematics for Teachers
   - Math 6055 Discrete Math
   - Math 6065 Connections in Mathematics

2. **Two Teacher Education Courses at 4 units each selected from**
   - T ED 6010 Seminar in Teaching and Learning Elementary Mathematics
   - T ED 6021 Seminar in Diagnosis and Treatment of Learning Difficulties in Mathematics
   - T ED 6030 Seminar on Problem Solving and Critical Thinking in Mathematics
   - T ED 6040 Advanced Curriculum and Instruction in Mathematics

\(^1\)Catalog reads "two" here, but the University requires 12 units. Thus, two math courses are only acceptable if they total 12 units, or if 6000-level classes in other departments are also present.
9 Mathematics: Option III  
(Applied Math)

9.1 Admission

To enter the program with Classified Graduate status, a student must have completed at least 36 units of acceptable upper division mathematics with a GPA of B or better. Included among these units must be courses in four areas: analysis, abstract algebra, linear algebra, and differential equations. Also, a course in computer programming is necessary.

A student with course or grade point deficiencies may be admitted to the program with Conditionally Classified status. Units taken to meet these deficiencies cannot be applied toward the M.S. degree, and no more than 20 units taken while in conditionally classified status can be applied toward the degree.

A student with classified status may apply for Advancement to Candidacy after (a) completing at least 16 units toward the M.S. degree with a B or better average (including at least three 6000-level math courses with a B or better) and (b) having approval of a complete course of study from the Mathematics Graduate Studies Committee. In particular, approval must be obtained for any course(s) taken outside the Mathematics and Computer Science Department.

9.2 Degree Requirements: Option III

The following department requirements for the M.S. degree are in addition to the general University requirements.

Required Courses The following four courses (or their equivalents) must be completed, either as an undergraduate or as a graduate student.

Math 3301 Analysis II  
Math/Stat 3401 Introduction to Probability Theory  
Math 3750 Numerical Analysis I  
Math 3841 Linear Programming

Other Course Requirements The 45 units applied to the degree must include:

6000-level courses At least 22 1/2 quarter units of 6000-level courses, of which at least 18 units are in mathematics. Math 60XX and courses outside of mathematics must be approved by the graduate committee.

At least two courses from the following five:

Math 6100 Applied Algebra  
Math 6331 Topics in Differential Equations  
Math 6870 Computer Simulation  
Math/Stat 6401 Advanced Probability  
Math 6750 Topics in Advanced Numerical Analysis

Comprehensive Examination A comprehensive exam must be passed. See Section 10 below for details.

10 Comprehensive Exam (Options I and III only)

All students are required to complete a Capstone Experience in order to receive the M.S. degree in mathematics. For Options I and III, this Capstone Experience is a Comprehensive Examination; for Option II, it is the Project (see Section 8).

The following information applies to Options I and III only. The comprehensive exam consists of four sections, each covering one area of mathematics. The exam for each section lasts two hours. In Option I, the areas are: Real Analysis, Complex Analysis, Algebra, and Topology. For Option III, they are: Applied Analysis (covering advanced calculus and differential equations), Numerical Analysis, Linear Programming, and Probability.

The exams are offered in Fall and Spring quarters, generally on the Thursday and Friday of the last (or next-to-last) week of the quarter. Syllabi listing topics to be covered on each exam are available, as are copies of exams from previous years, from the Mathematics/Computer Science Student Center.

Students must pass all four sections of the exam. Students who pass only one part of the exam at a given time receive no credit for that part and must repeat the entire exam at a later offering. Students who pass at least two parts at once will receive credit for those parts, and may take (or retake) the remaining parts at a later time. Thus, although a student may elect to take only two or three sections of the exam at one time, it is not useful to take only one section.

At most two attempts at the entire exam, or three attempts at any one part, are allowed, although the student may appeal to the Mathematics Graduate Committee to allow further attempts.

11 Acceptable Undergraduate Courses

At least half the units for the M.S. degree must be 6000-level courses (24 units for Options I and II; 22 1/2 units for Option III).

However, the remaining units may be in 3000 and 4000 level classes, if desired, unless these courses or their equivalents have been applied toward the student’s undergraduate degree. See the department website for a list of acceptable 3000/4000 level math courses.

Upper Division Computer Science courses may be used with the approval of the Math Graduate Studies Committee. Note that most computer science courses can only be used in Option III.