

Program Modification

Program modifications must be submitted by October 15, 2012, and finalized by the end of that fall semester for catalog production.
Enter data in **YELLOWED** areas.

Date (Change date if modified and update the file name with the new date): 2012 2013 Catalog Copy 5.9.12

Program Area: MATHEMATICS

Semester /Year First affected: FALL 2013

Instructions: Please use this Program Modification form for changes to existing program requirements, units, outcomes, emphases or options, or for other programmatic concerns. For minor changes (faculty or address changes, additions of approved electives, minor editing for clarity, and other minor updates) use the Program Update form, available at the Curriculum website. Paste the latest approved version of your entire program in the left AND right boxes below. Make your deletions in the LEFT column by using the strikethrough feature in Word or underlining, **and highlight**. Insert new language or other changes to the program on the RIGHT and highlight in **YELLOW** for easy identification. If possible, please align the two columns so that changes appear side-by-side with the original text.

SUMMARY OF CHANGES

1. Changed terminology for emphases, concentrations and options
2. Changed terminology for emphases, concentrations and options
3. Updated Electives and Concentrations
4. Updated MS core and Electives
5. Updated faculty info

JUSTIFICATION

1. New senate policy on emphases, concentrations and options
2. Since some courses changed, we had to update the offerings

CURRENTLY APPROVED PROGRAM

Mathematics

Programs Offered

- Bachelor of Science in Mathematics
- Minor in Foundational Mathematics
- Minor in Mathematics
- ~~Master of Science in Mathematics~~
- Approved CCTC Mathematics Subject Matter Waiver Program

PROPOSED PROGRAM

Mathematics

Programs Offered

- **Master of Science in Mathematics**
- Bachelor of Science in Mathematics
- Minor in Foundational Mathematics
- Minor in Mathematics
- Approved CCTC Mathematics Subject Matter Waiver Program

Mathematics can be pursued as a scholarly discipline of an especially elegant and creative art form or it can be treated as a valuable tool in an applied discipline. Our program addresses both needs. Students will be given a strong background in mathematics and statistics as well as a substantial amount of interdisciplinary applications in Physics, Biostatistics, Business, Computer and Information Sciences, Computer Imagining or Artificial Intelligence.

Careers

The mathematics major will prepare students for teaching careers, studies in graduate programs (in pure mathematics, applied mathematics, mathematics education, or the mathematical sciences) or for employment in high-tech and bio-tech industries, where mathematics-trained professionals with interdisciplinary expertise (sciences and business) are increasingly sought after.

Program Learning Outcomes

Students graduating from the Mathematics program will be able to:

- Demonstrate critical thinking, problem solving skills and ability to use advanced mathematical methods by identifying, evaluating, classifying, analyzing, and synthesizing data and abstract ideas in various contexts and situations;
- Demonstrate the knowledge of current mathematical applications, computing practices and use of broad technology in industry, science and education;
- Demonstrate ability to use modern software, abstract thinking, and mathematical practices connected to scientific and industrial problems, and demonstrate these skills that are currently used by technologies in society and education;
- Perform skills that enable them to evaluate, propose and convey novel solutions to scientific and business problems, etc.;
- Demonstrate cooperation skills by working effectively with others in interdisciplinary group-settings - both inside and outside the classroom; and
- Demonstrate a sense of exploration that enables students to pursue lifelong learning and currency in their careers in mathematics, statistics, education, high-tech and bio-tech industries.

Faculty

Ivona Grzegorzczuk, Ph.D., Professor of Mathematics, Chair, Mathematics and Applied Physics Programs, Academic Advisor for Mathematics and Single Subject Credential in Mathematics

Bell Tower West, Room 2275
(805) 437-8868

Mathematics can be pursued as a scholarly discipline of an especially elegant and creative art form or it can be treated as a valuable tool in an applied discipline. Our program addresses both needs. Students will be given a strong background in mathematics and statistics as well as a substantial amount of interdisciplinary applications in Physics, Biostatistics, Business, Computer and Information Sciences, Computer Imagining or Artificial Intelligence.

Careers

The mathematics major will prepare students for teaching careers, studies in graduate programs (in pure mathematics, applied mathematics, mathematics education, or the mathematical sciences) or for employment in high-tech and bio-tech industries, where mathematics-trained professionals with interdisciplinary expertise (sciences and business) are increasingly sought after.

Program Learning Outcomes

Students graduating from the Mathematics program will be able to:

- Demonstrate critical thinking, problem solving skills and ability to use advanced mathematical methods by identifying, evaluating, classifying, analyzing, and synthesizing data and abstract ideas in various contexts and situations;
- Demonstrate the knowledge of current mathematical applications, computing practices and use of broad technology in industry, science and education;
- Demonstrate ability to use modern software, abstract thinking, and mathematical practices connected to scientific and industrial problems, and demonstrate these skills that are currently used by technologies in society and education;
- Perform skills that enable them to evaluate, propose and convey novel solutions to scientific and business problems, etc.;
- Demonstrate cooperation skills by working effectively with others in interdisciplinary group-settings - both inside and outside the classroom; and
- Demonstrate a sense of exploration that enables students to pursue lifelong learning and currency in their careers in mathematics, statistics, education, high-tech and bio-tech industries.

Faculty

Ivona Grzegorzczuk, Ph.D., Professor of Mathematics, Chair, Mathematics and Applied Physics Programs, Academic Advisor for Mathematics and Single Subject Credential in Mathematics

Bell Tower East, Room 2756
(805) 437-8868

ivona.grze@csuci.edu Geoffrey Buhl, Ph.D., Assistant Professor of Mathematics Bell Tower West, Room 2235 (805) 437-3122 geoffrey.buhl@csuci.edu Geoffrey Dougherty, Ph.D., Professor of Physics, Applied Physics Coordinator Aliso Hall, Room 101 (805) 437-8990 geoff.dougherty@csuci.edu Jesse Elliott, Ph.D., MS in Mathematics Graduate Program Director, Associate Professor of Mathematics Bell Tower West, Room 2215 (805) 437-2768 jesse.elliott@csuci.edu Jorge Garcia, Ph.D., Associate Professor of Mathematics, Developmental Mathematics Coordinator Bell Tower West, Room 2219 (805) 437-2769 jorge.garcia@csuci.edu Kathryn Leonard, Ph.D., Assistant Professor of Mathematics Bell Tower West, Room 2245 (805) 437-3127 kathryn.leonard@csuci.edu Gregory Wood, Ph.D., Associate Professor of Physics Bell Tower West, Room 2295 (805) 437-3279 gregory.wood@csuci.edu Cindy Wyels, Ph.D., Professor of Mathematics Bell Tower West, Room 1191 (805) 437-3260 cynthia.wyels@csuci.edu Contact Information http://math.csuci.edu	ivona.grze@csuci.edu Geoffrey Buhl, Ph.D., Associate Professor of Mathematics Bell Tower East, Room 2776 (805) 437-3122 geoffrey.buhl@csuci.edu Geoffrey Dougherty, Ph.D., Professor of Physics, Applied Physics Coordinator Bell Tower East, Room 2484 (805) 437-8990 geoff.dougherty@csuci.edu Jesse Elliott, Ph.D., MS in Mathematics Graduate Program Director, Associate Professor of Mathematics Bell Tower East, Room 2758 (805) 437-2768 jesse.elliott@csuci.edu Jorge Garcia, Ph.D., Associate Professor of Mathematics, Developmental Mathematics Coordinator Bell Tower East, Room 2754 (805) 437-2769 jorge.garcia@csuci.edu Kathryn Leonard, Ph.D., Associate Professor of Mathematics Bell Tower East, Room 2782 (805) 437-3127 kathryn.leonard@csuci.edu Gregory Wood, Ph.D., Associate Professor of Physics Bell Tower East, Room 2814 (805) 437-3279 gregory.wood@csuci.edu Cindy Wyels, Ph.D., Professor of Mathematics Bell Tower East, Room 2780 (805) 437-3260 cynthia.wyels@csuci.edu Contact Information http://math.csuci.edu
--	--

Bachelor of Science in Mathematics - (120 units)

Lower Division Required Major Courses.....	34-35
Upper Division Required Major Courses	20
Upper Division Elective & Emphasis Major Courses	15-19
Electives	16
GE Included in Major Requirements	18
GE and American Institutions Requirement	34
TOTAL	120 units

Lower Division Requirements - 34-35 units

MATH 150	Calculus I.....	4
MATH 151	Calculus II.....	4
MATH 230	Logic and Mathematical Reasoning.....	3
MATH 240	Linear Algebra.....	3
MATH 250	Calculus III.....	3
PHYS 200	General Physics I.....	4

Select one of the following:

PHYS 201	and one additional science course	7-8
or		
	One two-semester science sequence.....	7-8

Select one of the following:

COMP 105	Computer Programming Introduction	3
COMP 150	Object-Oriented Programming.....	4

Select an additional Computer Science course:

COMP 150 or above or COMP 102	3-4
--	-----

Upper Division Requirements - 20 units

MATH 300	Discrete Mathematics.....	3
MATH 331	History of Mathematics	3
MATH 350	Differential Equations and Dynamical Systems	3
MATH 351	Real Analysis.....	3
MATH 352	Probability and Statistics.....	3
MATH 451	Complex Analysis	3

Bachelor of Science in Mathematics - (120 units)

Lower Division Required Major Courses.....	34-35
Upper Division Required Major Courses	20
Upper Division Elective & Concentration Major Courses	15-19
Electives	16
GE Included in Major Requirements	18
GE and American Institutions Requirement	34
TOTAL	120 units

Lower Division Requirements - 34-35 units

MATH 150	Calculus I.....	4
MATH 151	Calculus II.....	4
MATH 230	Logic and Mathematical Reasoning.....	3
MATH 240	Linear Algebra.....	3
MATH 250	Calculus III.....	3
PHYS 200	General Physics I.....	4

Select one of the following:

PHYS 201	and one additional science course.....	7-8
or		
	One two-semester science sequence.....	7-8

Select one of the following:

COMP 105	Computer Programming Introduction	3
COMP 150	Object-Oriented Programming.....	4

Select an additional Computer Science course:

COMP 150 or above or COMP 102	3-4
--	-----

Upper Division Requirements - 20 units

MATH 300	Discrete Mathematics.....	3
MATH 331	History of Mathematics	3
MATH 350	Differential Equations and Dynamical Systems	3
MATH 351	Real Analysis.....	3
MATH 352	Probability and Statistics.....	3
MATH 451	Complex Analysis	3

MATH 499	Senior Colloquium	1
	(Twice)	
Electives in Major - 9-13 units		
Note:		
1. Courses used for the emphases cannot be counted as elective.		
2. Students planning on teaching math have to choose MATH 492 for field experience requirement. Other courses recommended for teaching careers are marked with T.		
MATH 318-T	Mathematics for Secondary School Teachers	3
MATH 330-T	Mathematics and Fine Arts	3
MATH 345	Digital Image Processing (COMP/PHYS) ..	3
MATH 354	Analysis of Algorithms	3
MATH 393-T	Abstract Algebra 1	3
MATH 429	Operations Research	3
MATH 430	Research Design and Data Analysis	3
MATH 437	Mathematics for Simulations and Robotics	3
MATH 438	Philosophy of Mathematics	3
MATH 445	Image Analysis and Pattern Recognition (COMP/PHYS)	3
MATH 448	Scientific Computing	3
MATH 450	Partial Differential Equations and Mathematical Physics	3
MATH 452	Computational Bioinformatics (COMP)	4
MATH 480	Differential & Riemannian Geometry	3
MATH 482-T	Number Theory and Cryptography	3
MATH 484	Algebraic Geometry and Coding Theory	3
MATH 490	Topics in Modern Mathematics	3
MATH 492-T	Internship	3
	(Required)	
MATH 494	Independent Research	1-3
MATH 497	Directed Studies	3
MATH 499	Senior Colloquium	1
Required Supporting and Other GE Courses units		
GE and American Institutions Requirement		34
Elective Courses		16

MATH 499	Senior Colloquium	1
	(Twice)	
Electives in Major - 9-13 units		
Note:		
1. Courses used for the concentration cannot be counted as elective.		
2. Students planning on teaching math have to choose MATH 492 for field experience requirement. Other courses recommended for teaching careers are marked with T.		
MATH 318-T	Mathematics for Secondary School Teachers	3
MATH 330-T	Mathematics and Fine Arts	3
MATH 345	Digital Image Processing (COMP/PHYS) ..	3
MATH 354	Analysis of Algorithms	3
MATH 393-T	Abstract Algebra 1	3
MATH 429	Operations Research	3
MATH 430	Research Design and Data Analysis	3
MATH 437	Mathematics for Simulations and Robotics	3
MATH 438	Philosophy of Mathematics	3
MATH 445	Image Analysis and Pattern Recognition (COMP/PHYS)	3
MATH 448	Scientific Computing	3
MATH 450	Partial Differential Equations and Mathematical Physics	3
MATH 452	Computational Bioinformatics (COMP)	4
MATH 480	Differential & Riemannian Geometry	3
MATH 482-T	Number Theory and Cryptography	3
MATH 484	Algebraic Geometry and Coding Theory	3
MATH 490	Topics in Modern Mathematics	3
MATH 492-T	Internship	3
	(Required)	
MATH 494	Independent Research	1-3
MATH 497	Directed Studies	3
MATH 499	Senior Colloquium	1
Required Supporting and Other GE Courses units		
GE and American Institutions Requirement		34
Elective Courses		16

Select one interdisciplinary GE Course 3 units

Recommended:

COMP	447	Societal Issues in Computing	3
COMP	449	Human-Computer Interactions (PSY)	3
PHYS	434	Introduction to Biomedical Imaging (BIOL/HLTH)	4

Emphasis- 6-10 units

By the sophomore year, in order to plan their electives, students should decide on one of the following emphases and take all courses listed in the section.

Biomathematics - 10 units

Students selecting this emphasis should take BIOL 201

MATH	202	Biostatistics (PSY)	3
MATH	430	Research design and Data Analysis	3
MATH	452	Computational Bioinformatics (COMP)	4

Computer Science - 9 units

Students selecting this emphasis should take COMP 150 and COMP 151 for the computer science requirements.

MATH	448	Scientific Computing	3
MATH	354	Analysis of Algorithms	3
COMP	350	Introduction to Software Engineering	3

Physics - 6 units

Students selecting this emphasis should take PHYS 200 and 201(8) as the science sequence.

MATH	450	Partial Differential Equations and Mathematical Physics	3
Upper division Physics course			3

Applied Physics - 6 units

Students selecting this emphasis should take PHYS 200 and 201(8) as the science sequence.

MATH	345	Digital Image Processing (COMP/PHYS)	3
MATH	445	Image Analysis and Pattern Recognition (COMP/PHYS)	3

Actuarial Sciences/Economics - 9 units

MATH	429	Operations Research	3
ECON	300	Fundamentals of Economics	3
ECON	486	Introduction to Econometrics	3

Business Management - 9 units

Select one interdisciplinary GE Course 3 units

Recommended:

COMP	447	Societal Issues in Computing	3
COMP	449	Human-Computer Interactions (PSY)	3
PHYS	434	Introduction to Biomedical Imaging (BIOL/HLTH)	4

Concentrations - 6-10 units

By the sophomore year, in order to plan their electives, students should decide on one of the following concentrations and take all courses listed in the section.

Biomathematics - 10 units

Students selecting this concentration should take BIOL 201

MATH	202	Biostatistics (PSY)	3
MATH	430	Research design and Data Analysis	3
MATH	452	Computational Bioinformatics (COMP)	4

Computer Science - 9 units

Students selecting this concentration should take COMP 150 and COMP 151 for the computer science requirements.

MATH	448	Scientific Computing	3
MATH	354	Analysis of Algorithms	3
COMP	350	Introduction to Software Engineering	3

Physics - 6 units

Students selecting this concentration should take PHYS 200 and 201(8) as the science sequence.

MATH	450	Partial Differential Equations and Mathematical Physics	3
Upper division Physics course			3

Applied Physics - 6 units

Students selecting this concentration should take PHYS 200 and 201(8) as the science sequence.

MATH	345	Digital Image Processing (COMP/PHYS)	3
MATH	445	Image Analysis and Pattern Recognition (COMP/PHYS)	3

Actuarial Sciences/Economics - 9 units

MATH	429	Operations Research	3
ECON	110	Principles of Microeconomics	3
and one of the two courses below			
ECON	310	Intermediate Microeconomics	3

MATH	329	Applied Statistics for Business and Economics.....	3
MATH	429	Operations Research.....	3
Economics or Upper Division Management Course.....			3

Cognitive Science - 9 units

MATH	430	Research Design and Data Analysis.....	3
PSY	210	Learning, Cognition and Development.....	3
Upper Division Cognitive Psychology Course.....			3

Education - 9 units

MATH	318	Mathematics for Secondary School Teachers.....	3
MATH	393	Abstract Algebra I.....	3
EDUC	512	Equity, Diversity and Foundations of Schooling.....	3

Applied Mathematics - 9 units

MATH	429	Operations Research.....	3
MATH	448	Scientific Computing.....	3
MATH	450	Partial Differential Equations and Mathematical Physics.....	3

Digital Design - 9 units

MATH	393	Abstract Algebra 1.....	3
ART	108	Visual Technologies.....	3

Select one of the following:

ART	312	Digital Media Art: Time-Based Imaging and Compositing.....	3
ART	314	Digital Media Art: Digital Photography.....	3

Choice of other **emphases** or individualized **emphasis** is possible upon approval of the mathematics advisor.

Or			
ECON	329	Managerial Economics.....	3

Business Management - 9 units

MATH	329	Applied Statistics for Business and Economics.....	3
MATH	429	Operations Research.....	3
MGT	307	Management of Organizations.....	3

Cognitive Science - 9 units

MATH	430	Research Design and Data Analysis.....	3
PSY	318	Learning, Cognition and Perception.....	3
Upper Division Psychology Course.....			3

Education - 9 units

MATH	318	Mathematics for Secondary School Teachers.....	3
MATH	393	Abstract Algebra I.....	3
EDUC	512	Equity, Diversity and Foundations of Schooling.....	3

Applied Mathematics - 9 units

MATH	429	Operations Research.....	3
MATH	448	Scientific Computing.....	3
MATH	450	Partial Differential Equations and Mathematical Physics.....	3

Pure Mathematics - 9 units

MATH	393	Abstract Algebra 1.....	3
MATH	438	Philosophy of Mathematics.....	3
Upper Division Math Research or Topics Course.....			3

Digital Design - 9 units

MATH	393	Abstract Algebra 1.....	3
ART	108	Visual Technologies.....	3

Select one of the following:

ART	312	Digital Media Art: Time-Based Imaging and Compositing.....	3
ART	314	Digital Media Art: Digital Photography.....	3

Choice of other **concentrations** or individualized **concentration** is possible upon approval of the mathematics advisor.

Minor in Mathematics - (20 units)

MATH	150	Calculus I.....	4
MATH	151	Calculus II.....	4
MATH	300	Discrete Mathematics.....	3

In addition, students should select three upper division courses
2 units from the Mathematics program approved by the advisor.

Minor in Foundational Mathematics - (34-36 units)

This minor meets the needs of non-mathematics majors intending to enter a middle school mathematics teaching credential program. Especially, many Liberal Studies students would like to teach upper level elementary mathematics.

Lower Division Requirements - 15-16 units

(Including pre-/corequisites)

Choose one of the following:

MATH	101	College Algebra.....	3
MATH	105	Pre-Calculus.....	4
MATH	150	Calculus I.....	4

Choose one of the following:

MATH	201	Elementary Statistics.....	3
MATH	202	Biostatistics (PSY).....	3

Additional required courses:

MATH	208	Modern Mathematics for Elementary Teaching I - Numbers and Problem Solving.....	3
MATH	230	Logic & Mathematical Reasoning.....	3
MATH	240	Linear Algebra.....	3

Upper Division Requirements - 16 units

(Including pre-/corequisites)

MATH	308	Modern Mathematics for Elementary School Teaching II-Geometry, Probability	
------	-----	---	--

Minor in Mathematics - (20 units)

MATH	150	Calculus I.....	4
MATH	151	Calculus II.....	4
MATH	300	Discrete Mathematics.....	3

In addition, students should select three upper division courses
9 units from the Mathematics program approved by the advisor.

Minor in Foundational Mathematics - (34-36 units)

This minor meets the needs of non-mathematics majors intending to enter a middle school mathematics teaching credential program. Especially, many Liberal Studies students would like to teach upper level elementary mathematics.

Lower Division Requirements - 15-16 units

(Including pre-/corequisites)

Choose one of the following:

MATH	101	College Algebra.....	3
MATH	105	Pre-Calculus.....	4
MATH	150	Calculus I.....	4

Choose one of the following:

MATH	201	Elementary Statistics.....	3
MATH	202	Biostatistics (PSY).....	3

Additional required courses:

MATH	208	Modern Mathematics for Elementary Teaching I - Numbers and Problem Solving.....	3
MATH	230	Logic & Mathematical Reasoning.....	3
MATH	240	Linear Algebra.....	3

Upper Division Requirements - 16 units

(Including pre-/corequisites)

MATH	308	Modern Mathematics for Elementary School Teaching II-Geometry, Probability	
------	-----	---	--

		and Statistics	3
MATH	318-T	Mathematics for Secondary School Teachers.....	3
MATH	330	Mathematics and Fine Arts	3
MATH	331	History of Mathematics	3
MATH	499	Senior Colloquium	1

Select one of the following:

MATH	492	Internship.....	1-3
LS	499	Capstone Project.....	1-3

Electives

Choose one course from the list below 3-4 units

MATH	150	Calculus I.....	4
MATH	151	Calculus II	4
MATH	300	Discrete Mathematics.....	3
MATH	301	Discrete Mathematics for IT.....	3
MATH	393	Abstract Algebra I	3
MATH	482	Number Theory & Cryptography.....	3

or

Other upper division math course 3-4 units

Master of Science in Mathematics - (32 units)

(Offered through CSU Channel Islands' Extended University Program)

Our MS in Mathematics program is interdisciplinary and innovative in nature, and offers a flexible schedule with highly qualified faculty. It is designed to address the global need for people with advanced mathematical, computational, and computer skills throughout the industry, high-tech, and educational systems. Students will acquire a strong background in mathematics, and computer software, as well as the skills to conduct independent applied research or develop independent projects. The program will stress interdisciplinary applications, for example in Actuarial Sciences, Cryptography, Security, Image Recognition, Artificial Intelligence, and Mathematics Education, and will give students a valuable opportunity to gain teaching experience on the university level. Students' specializations depend on the final project/thesis and the electives chosen under the supervision a Mathematics advisor. An individual study plan can be designed to meet entry requirements for Ph.D. programs in Mathematical

		and Statistics.....	3
MATH	318-T	Mathematics for Secondary School Teachers.....	3
MATH	330	Mathematics and Fine Arts.....	3
MATH	331	History of Mathematics	3
MATH	499	Senior Colloquium	1

Select one of the following:

MATH	492	Internship.....	1-3
LS	499	Capstone Project.....	1-3

Electives

Choose one course from the list below 3-4 units

MATH	150	Calculus I.....	4
MATH	151	Calculus II	4
MATH	300	Discrete Mathematics.....	3
MATH	301	Discrete Mathematics for IT.....	3
MATH	393	Abstract Algebra I	3
MATH	482	Number Theory & Cryptography.....	3

or

Other upper division math course 3-4 units

Master of Science in Mathematics - (32 units)

(Offered through CSU Channel Islands' Extended University Program)

Our MS in Mathematics program is interdisciplinary and innovative in nature and offers a flexible schedule with highly qualified faculty. The program is a result of cooperation between mathematics, computer science, and physics faculty and is designed to address the global need for people with advanced mathematical, analytical, and computational skills. Students are provided with a strong background in mathematics and its applications as well as skills necessary to conduct independent research. The program incorporates interdisciplinary applications such as bioinformatics, actuarial sciences, cryptography, security, image recognition, artificial intelligence, mathematics education, and the philosophy of mathematics. Students' specializations depend on the electives chosen and on the final thesis/project conducted under the supervision of an advisor/mentor. An individual study plan can be designed to meet entry requirements for Ph.D. programs in mathematics or the

Sciences.

Admission Requirements

1. *Application* -- Apply to both the University and the Mathematics Program. Forms are available at the Extended University office and on-line at <http://math.csuci.edu/>.
2. *Recommendation* -- At least two letters of recommendations from academia or professional supervisors.
3. *Subject Matter Preparation* -- Applicants are expected to hold BS degree in mathematics. However students with other degrees (or equivalent coursework) maybe considered and admitted conditionally (subject to completing relevant undergraduate mathematics courses).
4. *GPA of 3.0 in Mathematical Sciences* -- If applicant does not have the required GPA, conditional admission maybe available on a limited bases.
5. *GRE* -- (general and mathematics) scores are recommended, but not required.

Faculty

Ivona Grzegorzczuk, Ph.D., Professor of Mathematics and
Chair, Mathematics Program
Bell Tower West, Room 2275
(805) 437-8868
ivona.grze@csuci.edu

Jesse Elliott, Ph.D., MS in Mathematics Graduate Program Director, Associate Professor
of Mathematics
Bell Tower West, Room 2215
(805) 437-2768
jesse.elliott@csuci.edu

Cindy Wyels, Ph.D., Professor of Mathematics
Bell Tower West, Room 1191
(805) 437-3260
cynthia.wyels@csuci.edu

mathematical sciences.

Admission Requirements

1. *Application* -- Apply at <http://ext.csuci.edu/admissions/>. Assistance with the application process is available at the Extended University office. The deadline is June 1 for admission in the Fall semester and November 1 for admission in the Spring semester.
2. *Recommendation* -- At least two letters of recommendations from academic or professional supervisors.
3. *Subject Matter Preparation* -- Applicants are expected to hold BS degree in mathematics. However students with other degrees (or equivalent coursework) maybe considered and admitted conditionally. With a conditional admission to the program, full admission can be obtained by successful completion of undergraduate mathematics courses in real analysis, probability theory, and abstract algebra. Only students with a full admission to the program are eligible for Teaching Associate positions.
4. *Minimum GPA of 3.0 in Mathematical Sciences* -- If applicant does not have the required GPA, conditional admission maybe available on a limited bases.
5. *GRE General Test* scores are required for cumulative undergraduate GPAs falling below 3.0.

Faculty

Jesse Elliott, Ph.D., MS in Mathematics Graduate Program Director, Associate Professor
of Mathematics
Bell Tower East, Room 2758
(805) 437-2768
jesse.elliott@csuci.edu

Ivona Grzegorzczuk, Ph.D., Professor of Mathematics, Chair, Mathematics and Applied
Physics Programs,
Bell Tower East, Room 2756
(805) 437-8868
ivona.grze@csuci.edu

Geoffrey Buhl, Ph.D., Associate Professor of Mathematics
Bell Tower East, Room 2776
(805) 437-3122
geoffrey.buhl@csuci.edu

Geoffrey Dougherty, Ph.D., Professor of Physics,

Bell Tower East, Room 2484
(805) 437-8990
geoff.dougherty@csuci.edu

Jorge Garcia, Ph.D., Associate Professor of Mathematics,
Bell Tower East, Room 2754
(805) 437-2769
jorge.garcia@csuci.edu

Kathryn Leonard, Ph.D., Associate Professor of Mathematics
Bell Tower East, Room 2782
(805) 437-3127
kathryn.leonard@csuci.edu

Cindy Wyels, Ph.D., Professor of Mathematics
Bell Tower East, Room 2780
(805) 437-3260
cynthia.wyels@csuci.edu

Contact Information <http://math.csuci.edu>

Requirements for the Master of Science in Mathematics - 32 units

Core Courses - 11 units

Choose three courses from the following list (at least two courses must be in Mathematics):

MATH	511	Functional Analysis	3
MATH	512	Probabilistic Methods and Measure Theory	3
MATH	513	Advanced Algebra	3
COMP	554	Algorithms (MATH)	3
COMP	569	Artificial Intelligence	3
PHYS	510	Advanced Image Analysis Techniques (COMP/MATH)	3

And required two units of:

MATH	599	Graduate Seminar	1
------	-----	------------------------	---

Requirements for the Master of Science in Mathematics - 32 units

Core Courses - 7 units

Choose two courses from the following list:

MATH	511	Functional Analysis	3
MATH	512	Probabilistic Methods and Measure Theory	3
MATH	513	Advanced Algebra	3

And required two units of:

MATH	599	Graduate Seminar	1
------	-----	------------------------	---

Electives - 18 units*

Electives - 15 units*

Choose five electives from the following list (at least three courses in Mathematics):

MATH	511	Functional Analysis.....	3
MATH	512	Probabilistic Methods and Measure Theory.....	3
MATH	513	Advanced Algebra.....	3
MATH	555	Actuarial Sciences.....	3
MATH	565	Research in Mathematics Education.....	3
MATH	570	Combinatorics.....	3
MATH	581	Mathematical Methods in Artificial Intelligence (COMP).....	3
MATH	582	Number Theory and Cryptography.....	3
MATH	584	Algebraic Geometry and Coding Theory..	3
MATH	587	Markov Chains and Markov Processes.....	3
MATH	588	Stochastic Analysis.....	3
MATH	594	Independent Study.....	1-3
PHYS	546	Pattern Recognition (COMP/MATH).....	3
PHYS	546	Pattern Recognition.....	3
COMP	520	Advanced Database Systems.....	3
COMP	524	Security.....	3
COMP	529	Network Computing.....	3
COMP	549	Human-Computer Interaction.....	3
COMP	550	Advanced Software Engineering.....	3
COMP	569	Artificial Intelligence.....	3
COMP	571	Biologically Inspired Computing.....	3
COMP	572	Neural Networks.....	3
COMP	575	Multi-Agent Systems.....	3
COMP	578	Data Mining.....	3

*other graduate or junior/senior courses from related disciplines may be included with advisors approval.

Projects or Masters Thesis Concentration- 6 units

MATH	597	Master Thesis.....	3
or			
MATH	598	Master Project.....	3

Choose six electives from the following list (at least three MATH courses):

MATH	511	Functional Analysis.....	3
MATH	512	Probabilistic Methods and Measure Theory.....	3
MATH	513	Advanced Algebra.....	3
MATH	555	Actuarial Sciences.....	3
MATH	565	Research in Mathematics Education.....	3
MATH	570	Combinatorics.....	3
MATH	581	Mathematical Methods in Artificial Intelligence (COMP).....	3
MATH	582	Number Theory and Cryptography.....	3
MATH	584	Algebraic Geometry and Coding Theory..	3
MATH	587	Markov Chains and Markov Processes.....	3
MATH	588	Stochastic Analysis.....	3
PHYS	510	Advanced Image Analysis Techniques.....	3
PHYS	546	Pattern Recognition.....	3
COMP	520	Advanced Database Systems.....	3
COMP	524	Security.....	3
COMP	529	Network Computing.....	3
COMP	549	Human-Computer Interaction.....	3
COMP	550	Advanced Software Engineering.....	3
COMP	554	Algorithms.....	3
COMP	569	Artificial Intelligence.....	3
COMP	571	Biologically Inspired Computing.....	3
COMP	572	Neural Networks.....	3
COMP	575	Multi-Agent Systems.....	3
COMP	578	Data Mining.....	3

*MATH 594 (Independent Study) and other graduate or advanced undergraduate courses from mathematics or the mathematical sciences may be included with the graduate advisor's approval.

Projects or Masters Thesis Concentration- 6 units

MATH	597	Master Thesis.....	3
or			
MATH	598	Master Project.....	3

*A thesis advisor must be chosen before registering for the first unit of thesis, and a thesis committee must be formed before registering for the sixth unit of thesis. Successful completion of the thesis requirement requires (1) an oral thesis defense to the thesis committee, (2) a presentation of the thesis results to the campus community,

Graduate Writing Assessment Requirement Writing proficiency prior to the awarding of the degree is demonstrated by successful completion of at least <u>two</u> credits of MATH 597 (Masters Thesis) or MATH 598 (Masters Project) with a grade of B or higher.	(3) a signature page with signatures of acceptance from all thesis committee members, and (4) electronic submission of the thesis to the University Library for archiving. Graduate Writing Assessment Requirement Writing proficiency prior to the awarding of the degree is demonstrated by successful completion of at least <u>two</u> credits of MATH 597 (Masters Thesis) or MATH 598 (Masters Project) with a grade of B or higher.

Ivona Grzegorzcyk, Jesse Elliott

Proposer of Program Modification

Date

APPROVAL SHEET

Program: MATHEMATICS

If your course has a General Education Component or involves Center affiliation, the Center will also sign off during the approval process.

Multiple Chair fields are available for cross-listed courses.

The CI program review process includes a report from the respective department/program on its progress toward accessibility requirement compliance. By signing below, I acknowledge the importance of incorporating accessibility in course design.

Program Chair		
	Signature	Date

Curriculum Chair		
	Signature	Date

AVP		
	Signature	Date