

# THE UCI MATH SUBJECT MATTER PREPARATION PROGRAM (SMPP) FOR FUTURE MATH TEACHERS

## **Waive the math subject exam for teachers (CSET) by completing SMPP courses.**

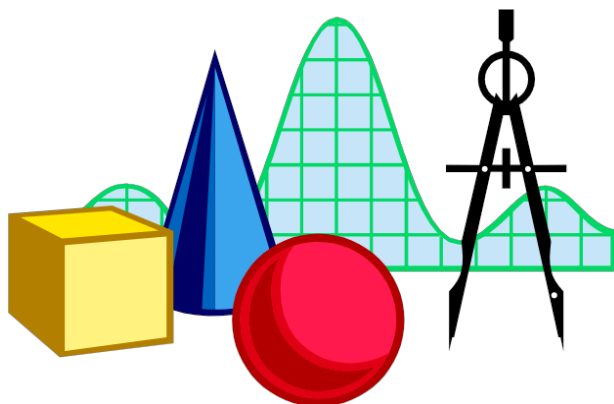
The state of California requires that all middle school and high school math teachers demonstrate an advanced level of knowledge in mathematics for six core domains: algebra, geometry, calculus, number theory, probability and statistics, and the history of mathematics. Future mathematics teachers demonstrate their math subject matter competency in one of two ways: a) take and pass the mathematics CSET exam; or b) complete a specific undergraduate program of courses and fieldwork at UCI referred to as the “Math Subject Matter Preparation Program” or SMPP. Taking the exam or completing the SMPP is a prerequisite for student teaching in a teacher credential program. A list of course requirements for the UCI Math SMPP starts on page 2 of this document. Aspiring teachers with majors in mathematics, engineering, ICS, or other related disciplines should consult an academic advisor as soon as possible to plan an undergraduate program of study that includes SMPP courses. The **Math Major with a Specialization in Mathematics for Education** and the **Math Major with a Concentration in Mathematics for Education with Secondary Teaching Certification** both have a significant number of courses that overlap with the math SMPP. Those students who are enrolled in the Concentration in Mathematics for Education with Secondary Teaching Certification must complete all SMPP requirements **prior to** starting student teaching. The SMPP is equivalent to passing all 3 Math CSET exams.

## **Get More Information At:**

- Contact the School of Education Office of Student Affairs, 2204 Education, 949-824-8082; or the UCI CalTeach Science and Mathematics Resource Center, Bison Modular 137, 949-824-5672

## **Verifying Completion of Math SMPP Requirements:**

Students who have completed all UCI Math SMPP requirements need to have SMPP completion verified by a counselor in the School of Education Office of Student Affairs, 2204 Education, 949-824-8082. When all SMPP requirements have been met, the counselor will provide the student with an SMPP completion verification letter and will submit a CSET exam waiver request to the California Commission on Teacher Credentialing.



<u>Mathematics Courses</u>		<u>Units</u>
□ Math 2A	Single Variable Calculus Introduction to derivatives, calculation of derivatives of algebraic and trigonometric functions; applications including curve sketching, related rates, and optimization. Exponential and logarithm functions.	4
□ Math 2B	Single Variable Calculus Definite integrals; the fundamental theorem of calculus. Applications of integration including finding areas and volumes. Techniques of integration. Infinite sequences and series. Parametric and polar equations.	4
□ Math 2D	Multivariable Calculus Differential and integral calculus of real-valued functions of several real variables, including applications. Polar coordinates.	4
□ Math 3A	Introduction to Linear Algebra Systems of linear equations, matrix operations, determinants, eigenvalues and eigenvectors, vector spaces, subspaces and dimension.	4
□ Math 13	Introduction to Abstract Mathematics Introduction to formal definition and rigorous proof writing in mathematics. Topics include basic logic, set theory, equivalence relations, and various proof techniques such as direct, induction, contradiction, contrapositive, and exhaustion.	4
□ Math 105A	Numerical Analysis Introduction to the theory and practice of numerical computation. Floating point arithmetic, roundoff; solving transcendental equations; quadrature; linear systems, eigenvalues, power method.	4
□ Math 120A	Introduction to Abstract Algebra: Groups Axioms for group theory; permutation groups, matrix groups. Isomorphisms, homomorphisms, quotient groups. Advanced topics as time permits. Special emphasis on doing proofs.	4
□ Math 120B	Introduction to Abstract Algebra: Rings and Fields Basic properties of rings; ideals, quotient rings; polynomial and matrix rings. Elements of field theory.	4
□ Math 121A	Linear Algebra Introduction to modern abstract linear algebra. Special emphasis on students doing proofs. Vector spaces, linear independence, bases, dimension. Linear transformations and their matrix representations. Theory of determinants.	4
□ Math 130A, Math 131A or Stats 120A	Introduction to Probability and Statistics Basic concepts of random variables, distributions, independence, correlations, moments, limit theorems, conditional probability, Markov chains, gambler's ruin, branching process, birth and death processes, numerical simulations in Matlab.	4
□ Math 130B, Math 131B or Stats 120B	Introduction to Probability and Statistics Exponential distributions, Poisson processes, continuous time Markov chains, renewal theory, insurance ruin and claim problems, numerical simulations in Matlab.	4
□ Math 140A	Elementary Analysis Introduction to real analysis, including: convergence of sequence, infinite series, differentiation and integration, and sequences of functions. Students are expected to do proofs.	4
□ Math 161	Modern Geometry Euclidean Geometry; Hilbert's Axioms; Absolute Geometry; Hyperbolic Geometry; the Poincare Models; and Geometric Transformations.	4
□ Math 180A	Number Theory Introduction to number theory and applications. Divisibility, prime numbers, factorization. Arithmetic functions. Congruences. Quadratic residue. Diophantine equations. Introduction to cryptography.	4
□ Math 184	History of Mathematics Topics vary from year to year. Some possible topics: mathematics in ancient times; the development of modern analysis; the evolution of geometric ideas. Students will be assigned individual topics for term papers.	4
□ Physics/ Chem 193/ Bio 108 <sup>1</sup>	Research Methods An exploration of tools of inquiry for developing and implementing science research projects. Students will undertake independent projects requiring data collection, analysis and modeling and the organization and presentation of results.	4

<sup>1</sup> SMPP addition: Fall 2016

<b><u>Other Courses</u></b>	<b><u>Units</u></b>
<b><i>Students select <u>one</u> math teaching and learning course from the following choices:</i></b>	<b>4</b>
Math 8 <sup>2</sup> , and Explorations in Functions and Modeling	
ED 172B <sup>2</sup> , or Teaching and Learning Secondary Mathematics	
ED 143A <sup>2</sup> Classroom Interactions I	
<b><i>Math classroom fieldwork in public schools</i></b>	<b>6</b>
PS 5 and Introduction to Science and Mathematics Teaching (3 units)	
PS 105 Middle School Science and Mathematics Teaching (3 units)	
<b><i>Students select <u>one</u> computing skills course that meets math major (or a related major) requirements. Choices include, but are not limited to:</i></b>	<b>4</b>
ICS 21, or Introduction to Computer Science I	
ICS 31, or Introduction to Programming	
E10, or Computational Methods in Engineering	
EECS 10, or Computational Methods in Electrical and Computer Engineering	
EECS 12, or Introduction to Programming	
CEE 10, or Methods I: Computation Methods in Civil & Envir. Engineering	
MAE 10, or Introduction to Engineering Computations	
MA 9, or Introduction to Programming for Numerical Analysis	
Physics 53 Introduction to C and Numerical Analysis	
<b><i>Students complete Natural Science courses that meet math major (or a related major) requirements, and/or meet UCI undergraduate general education requirements. Choices include but are not limited to<sup>3</sup></i></b>	<b>12 or 14</b>
Physics 7A,B,D or 7A, Classical Physics	
B,E or 7B, D, E or	
Chemistry 1A, B, C General Chemistry	
<b><i>Students complete a course that includes a “capstone” assignment where they blend their knowledge of mathematics and math education:</i></b>	<b>1</b>
MA 184L History of Mathematics Lesson Lab (completed concurrently with MA 184)	

**Additional Math SMPP Requirements**

- SMPP candidates must complete an online **tutorial on ethics & legal issues for technology use in schools**. Students should expect to spend about 4 hours to complete it. Request the technology tutorial instructions by emailing [gseinfo@uci.edu](mailto:gseinfo@uci.edu)
- SMPP candidates must have an average, cumulative GPA of 2.0 or better for the SMPP-required courses.

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<sup>2</sup> Students enrolled in the Concentration in Mathematics for Education and Secondary Teaching Certification will take EDUC 143A and MA 8 to satisfy this requirement. Others may take MA 8 and ED 172B. (Education 172B may not be offered in some years.)

<sup>3</sup> The physics and chemistry courses listed for this natural sciences requirement are suggestions only. Students are encouraged to satisfy this requirement using natural science courses that satisfy their major requirements or UCI General Education requirements.