

Department of Mathematics
College of Science and Mathematics
Student Outcomes Assessment Plan (SOAP)
For Graduate Program

I. Mission Statement

The graduate program of the Department of Mathematics at California State University, Fresno offers a high quality educational opportunity to qualified students at the Master's level. The program provides students with opportunities for personal and career enhancement through advanced study. Its goal is to prepare students for work in industry, advanced study in doctoral programs, and assumption of a leadership role in mathematics education. The program emphasizes quality teaching and offers close interaction between faculty and students.

II. Goals and Student Learning Outcomes

A. Provide students with advanced knowledge in the core areas of mathematics at the graduate level.

1. Students will understand, describe, and illustrate the structural relationships among fundamental concepts in abstract algebra and real analysis (and geometry for students in the Teaching Option), such as function/transformation, derivative, integral, matrix, number/function set, algebraic structure (group, field, etc.).

B. Continue development of students' ability to read, understand, and write rigorous mathematical proofs.

1. Students will read, understand, and be able to reconstruct rigorous proofs of classical theorems in algebra and analysis (and geometry for students in the Teaching Option).

2. Students will write advanced proofs in algebra and analysis (and geometry for students in the Teaching Option).

C. Provide students with opportunities to apply mathematical knowledge to solve theoretical and practical problems.

1. Students will utilize advanced problem-solving skills.

2. Students will enhance computational and visualization skills by utilizing mathematical software.

D. Continue development of students' communication skills, both written and oral for purposes of conveying mathematical information.

1. Students will be able to explain their solutions and proofs both orally and in writing.
2. Students will be able to use technology in written reports and oral presentations.

E. Encourage a positive attitude towards mathematics teaching and learning.

1. Students will show their excitement and appreciation for the art and science of mathematics.

F. (For students in the Teaching Option) Provide students with a background for taking leadership in pre-college mathematics teaching.

1. Students will acquire an advanced conceptual viewpoint of 9-12 mathematics content.
2. Students will be knowledgeable of curriculum theories and practices, and of current issues and trends in mathematics education.

III. Curriculum Map (Matrix of Courses x Learning Outcomes)

	A.1	B.1	B.2	C.1	C.2	D.1	D.2	E.1	F.1	F.2
251	A	A	A	R		R				
271	A	A	A	R		R				
250	R	R	R	R		R			I	
260	R	R	R	R		R			I	
270	R	R	R	R		R			I	
CI 250										I
CI 275										I
202	R								I	I
216				R		R		I		
223				R		R				
228	R	R		R		R				

232				R	I		I			
263		R	R							
290	R	R		R	I,R	R	I, R	I, R	R	R
291	R	R						R		
298	A	A	A	A	R, A	A	A	A	R	R

Notes:

- (1) 251, 271, 298 and 7 electives – required for Traditional Track.
- (2) 250, 260, 270, 298, CI250, CI275, and 4 electives – required for Teaching Option.
- (3) I=Introduced, R=Reinforced, A=Advanced

IV. Assessment Methods

Direct measures:

1. Embedded questions on exams in the following courses:

- a. Math 251
- b. Math 271
- c. Math 250
- d. Math 260
- e. Math 270

on a rotating basis (one course/year).

2. Qualifying Examination. (Data to be collected every year, reviewed and evaluated every 5 years.)

3. Final project (Math 298). (Reports from project committee to be collected every year, reviewed and evaluated every 5 years.)

Indirect measures:

- 4. Exit survey. (To be administered every year, reviewed and evaluated every 5 years.)
- 5. Alumni survey
- 6. Employer survey

V. Student Learning Outcomes x Assessment Methods Matrix

	A.1	B.1	B.2	C.1	C.2	D.1	D.2	E.1	F.1	F.2
1.ab	x	x	x	x		x				
1.cde	x	x	x	x		x			x	
2	x	x	x	x		x				
3	x	x	x	x	x	x	x	x	x	x
4	x				x		x			
5			x		x		x	x	x	x
6			x			x	x	x		x

VI. Timeline for Implementation of Assessment Methods and Summary

2010-2011: 1.a, 2

2011-2012: 1.c, 4

2012-2013: 1.b, 3

2013-2014: 1.d, 5

2014-2015: 1.e, 6

VII. Closing the loop – Summary Evaluation, Curriculum Adjustment, and Reporting

The assessment committee will meet annually to review the results of the assessment activities and determine areas where curriculum changes may be necessary. The report will be forwarded to the department. The department will decide whether/which curriculum changes should be made. Based on the department's selection, the curriculum committee will develop and propose specific changes back to the department.