



2009-2010 Assessment Plan Report

PROGRAM ASSESSMENT REPORT AY 2009-2010

Report Date: 6/3/10
School/College: Arts and Sciences
Department/Program: Mathematics
Person completing the Report: Stephen Devlin

1. **Overview Statement:** Briefly summarize the assessment activities that were undertaken this academic year, indicating:
 - which program learning outcomes were assessed this year.
 - who in your department/program was involved in the assessment of the above learning outcomes

This year the Mathematics Department assessed learning outcomes 1, 2, 4, 5, 6, and 7:

1. Use techniques of differentiation and integration of one and several variables.
2. Use differentiation and integration to solve problems in mathematics and other disciplines.
4. Give direct proofs, proofs by contradiction, and proofs by induction.
5. Formulate definitions.
6. Read mathematics without supervision.
7. Apply mathematics to problems in other disciplines.

Professor Needham was involved in the assessment of outcomes 1, 2, 4, 5, 6, and 7; Professor Yeung in the assessment of 1, 2, and 7; and Professors Van Cott and Chubb in the assessment of 4, 5, and 6.

2. **Please Answers the Following Questions for Each of the Student Outcomes Assessed:**

- **What did you do?**
Describe clearly and concisely how you assessed the learning outcomes that were evaluated this year (e.g., measures, research methods, etc.). [please use bullet points to answer this question]

Instructors crafted final exam questions to address the relevant learning outcomes. The following courses were used to address the listed outcome:

- Outcome 1: Math 109 (Calculus I), Math 110 (Calculus II), Math 355 (Complex Analysis), Phys 371 (Mathematical Methods in Physics).



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- Outcome 2: Math 109 (Calculus I), Math 110 (Calculus II), Math 355 (Complex Analysis), and Phys 371 (Mathematical Methods in Physics).
 - Outcome 4: Math 235 (Formal Methods), Math 355 (Complex Analysis), and Math 485 (Topology).
 - Outcome 5: Math 235 (Formal Methods), Math 355 (Complex Analysis), and Math 485 (Topology).
 - Outcome 6: Math 110 (Calculus II), Math 235 (Formal Methods), Math 355 (Complex Analysis), and Math 485 (Topology).
 - Outcome 7: Math 109 (Calculus I), Math 110 (Calculus II), Math 235 (Formal Methods), Math 355 (Complex Analysis), Phys 371 (Mathematical Methods in Physics).
- **What did the faculty in the department or program learn this year?**
Summarize your findings and conclusions as a result of the assessment indicating strengths and weaknesses in student learning demonstrated by this assessment.

See the included report of the Mathematics Department's findings. The department shows strength in achieving outcomes 1, 2, 5, and 7, and is adequate in achieving outcome 4. The department may need to modify its approach to outcome 6.

- **What will be done differently as a result of what was learned this year?**
Discuss how courses and/or curricula will be changed to improve student learning as a result of the assessment. Include a discussion of how the faculty will help students overcome their weaknesses and improve their strengths.

The department will use this year's assessment findings as a starting point for discussion in the fall. Learning outcome 6 arises as a potential weakness, so the department will consider ways to help students become more independent in their reading of high level mathematics. This may involve curricular changes, or a further emphasis on student reading of texts before class.

- **What actions were taken this academic year "to close the loop" relative to what was discovered from last years assessment activities?**
Discuss how courses and/or curricula changed to improve student learning as a result of last year's assessment. Include a discussion of how the faculty helped students overcome their weaknesses and improve their strengths.

The department focused on learning outcome 2 which was identified as a potential weakness in last year's assessment report. The department took part in discussions of pedagogy and reconsidered how time could be better allocated to topics in



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courses relevant to outcome 2. This year's findings indicate that the department was successful in achieving considerably better results on learning outcome 2.

3. **Attach a copy of the components of the department/program assessment plan that have been modified since its initial submission:**
 - Program Mission
 - Program Learning Goals
 - Program Learning Outcomes
 - Program Learning Rubrics aligned with outcomes
 - Curriculum map that shows the courses that pertain to the outcome

Please return to: Provost Office by June 1, 2010

You can send your replies as either a Word attachment (to: marin@usfca.edu) or as a hard copy to: Provost Office, Lone Mountain Rossi Wing 4th floor.

If you have any questions, please contact: William Murry, Director of Institutional Assessment (wmurry@usfca.edu or x5486).