

2011/2012 Assessment Report

BA Math/ BA Math Preparation for Teaching

SLO 1 Ability to Read and Write Proofs

An assessment report for this SLO was submitted in May 2011 by Dr. Marilyn Blockus and reviewed by the Math Dept undergraduate curriculum committee as well as the Math Dept chair. Conclusion: BA Math majors appear to be making satisfactory progress in learning how to read and write proofs in Math 108 Introduction to Proof. All BA Math/BA Math Preparation for Teaching Majors are required to take Math 108.

SLO 2 Ability to Communicate Mathematical Ideas Effectively

This SLO is to be assessed in Fall 2012 in Math 104 History of Math which is a course where students are asked to write one or more reports. Also in Fall 2011 the Math Dept chair conducted a Technology and Communication survey asking instructors to list courses where they require students to write and/or give oral presentations of reports and describe other techniques they are using to get students to learn the effective communication of mathematical ideas. All BA Math Preparation for Teaching majors and many other BA Math majors take Math 104.

SLO 3 Ability to Use and Understand Basic Mathematical Computations

All BA Math majors are required to take Math 30 Calculus I, Math 31 Calculus II, Math 32 Calculus III, Math 42 Discrete Math, and Math 129A Linear Algebra. Students learn many important computations and skills in these classes. They also are introduced to basic mathematical modeling (Math 30,31,32, Math 129A) proof writing (Math 42 and Math 129A), and the uses of graphing calculators (Calculus) and mathematical software (MATLAB in Math 129A).

For Spring 2011/Fall 2011 the passing rates in these courses was as follows.

For Calculus I (Math 30 and Math 30P) the overall passing rate (C- or better) was 77.3% and for math majors the passing rate was $13/18 = 72.2\%$. In Calculus I students learn to use and apply limits, continuity, differentiation, mathematical modeling involving differentiation, and graphical, algebraic and numerical methods of solving problems.

For Math 31 Calculus II the overall passing rate (C- or better) was 73.0 % and for math majors the passing rate was $18/25 = 72.0\%$. In Calculus II students learn to use and apply definite and indefinite integration, summation of sequences and series, mathematical modeling involving integration, and graphical, algebraic and numerical methods of solving problems.

For Math 32 Calculus III the overall passing rate (C- or better) was $404/584 = 69.2\%$ and for math majors the passing rate was 77.8%. In Calculus III students learn to use and apply functions of more than one variable, partial derivatives, multiple integrals vector calculus, mathematical modeling involving functions of several variables, and graphical, algebraic and numerical methods of solving problems.

For Math 42 Discrete Math the overall passing rate (C- or better) was $227/348 = 65.2\%$ and for math majors the passing rate was $29/39 = 74.4\%$. In Discrete Math students learn to use and apply sets, logic, methods of proof including mathematical induction, functions, relations, elementary combinatorics, probability, and Boolean algebras.

For Math 129A Linear Algebra the overall passing rate (C- or better) was $263/367 = 71.7\%$ and for math majors the passing rate was $30/37 = 81.1\%$. In Linear Algebra students learn to use and apply matrices, systems of linear equations, vector geometry, vector spaces, linear transformations, determinants, eigenvectors and eigenvalues, orthogonality, diagonalization, and the uses of mathematical software in linear algebra.

Conclusion: Passing rates in these courses indicate that BA Math/BS Applied Math majors are making satisfactory progress in learning these important skills and computations.

SLO 4 Ability to Use Technology to Solve Mathematical Problems

This SLO was assessed in Fall 2011 in Math 143M Numerical Linear Algebra which is a course where students are asked to write one or more computer programs to solve mathematical problems. The assessment report was written up by the Math 143M instructor for the fall Dr. Plamen Koev and reviewed by the Math Dept chair and the Math Dept Undergraduate Curriculum committee. Conclusion: BA Math majors in Math 143M appear to be making satisfactory progress in learning to write programs to solve mathematical problems. Also in Fall 2011 the Math Dept chair conducted a Technology and Communication survey asking instructors to list courses in which they are asking students to write programs and describe other techniques they are using to get students to learn how to write effective programs and use technology effectively for solving mathematical problems.

BS Applied Math Concentration in Statistics, Concentration in Applied and Computational Mathematics, Concentration in Economics and Actuarial Science

SLO 2 Ability to Communicate Mathematical Ideas Effectively

This SLO is to be assessed in Fall 2012 in Math 161B Applied Probability and Statistics II which is a course where students are asked to write one or more reports. Math 161B is required for many but not all BS Applied Math majors. Also in Fall 2011 the Math Dept chair conducted a Technology and Communication survey asking instructors to list courses in which they are asking students to write and/or give oral presentations of reports and describe other techniques they are using to get students to work on effective communication of mathematical ideas.

SLO 3 Ability to Use and Understand Basic Mathematical Computations

All BS Applied Math majors are required to take Math 30 Calculus I, Math 31 Calculus II, Math 32 Calculus III, Math 42 Discrete Math, and Math 129A Linear Algebra, Math 133A Ordinary Differential Equations, and Math 161A Applied Probability and Statistics. Students learn many important computations and skills in these classes. They are introduced to mathematical modeling (Math 30,31,32, Math 129A, 133A, 161A), proof writing (Math 42 and Math 129A) and technology (the use of MATLAB) in Math 129A.

For Spring 2011/Fall 2011 the passing rates in these courses were as follows.

See BA Math assessment report for grade data on Math 30, 30P, 31, 32, 42, and 129A.

For Math 133A Ordinary Differential Equations the overall passing rate (C- or better) was $353/452 = 78.1\%$ and for math majors the passing rate was $20/23 = 87.0\%$. In Ordinary Differential Equations students learn to use and apply first order differential equations, first order linear systems, second order linear equations, Laplace transforms, and series solutions.

For Math 161A Applied Probability and Statistics the overall passing rate (C- or better) was $116/166 = 69.9\%$ and for math majors the passing rate was $40/52 = 76.9\%$. In Math 161A students learn to use and apply descriptive and inferential statistics, collection and analysis of data, discrete and continuous probability models, random variables, Central Limit Theorem, confidence intervals, and hypothesis testing.

Conclusion: Passing rates in these courses indicate that BA Math/BS Applied Math majors are making satisfactory progress in learning these important skills and computations.

SLO 4 Ability to Use Technology to Solve Mathematical Problems

See BA Math Assessment Report for SLO 4 Assessment Data.

SLO 5 Ability to Use Mathematical Models to Analyze and Solve Mathematical Problems

This SLO is assessed for BS Applied Math majors in Math 178 Introduction to Mathematical Modeling where students are asked to develop and analyze a variety of mathematical models. Math 178 is also taken by a large number of BA Math/BA Math Preparation for Teaching Majors. This SLO was assessed in Fall 2010 by Richard Low the Math 178 instructor for that semester. The Assessment report was submitted in Fall 2010 and reviewed by the Math Dept Undergraduate Curriculum Committee and the Math Dept chair. Conclusion: BA/BS Math majors appear to be making satisfactory progress in learning to use and analyze mathematical models in Math 178. A second modeling course Math 178L Mathematical Modeling for Life Sciences is being developed by Dr. Bem Cayco and will be offered Fall 2012.