Math Department Assessment Schedule  Fall 2010

Goal 1 The Ability to Use and Construct Logical Arguments
The ability to reason logically to conclusions, including the ability to use precise definitions and to use various forms of logical argument.

Specific Learning Objectives to be assessed:

1. Ability to give direct proofs
2. Ability to give proofs by contradiction
3. Ability to give proofs by mathematical induction
4. Ability to apply definitions to give proofs
5. Ability to give proofs and disproofs involving quantified statements

Goal 2 The Ability to Communicate Mathematics Effectively
The ability to read mathematics with understanding and to communicate mathematical ideas with clarity and coherence.

Specific Learning Objectives to be assessed:

1. Ability to state a problem accurately, articulate assumptions, and describe a method of solution
2. Ability to conduct independent investigation of mathematical concepts at the undergraduate level
3. Ability to give written reports and oral presentations that include mathematical context which is mathematically accurate, yet accessible to classmates

Goal 3 The Ability to Perform Standard Mathematical Computations
Specific Learning Objectives to be assessed:

1. Ability to evaluate limits
2. Ability to calculate derivatives and integrals
3. Ability to apply properties of algebraic and transcendental functions

Goal 4 The Ability to Use Technology to Solve Mathematical Problems
Specific Learning Objectives to be assessed:

1. Ability to write programs to solve mathematical problems
2. Ability to use a mathematical programming environment such as MATLAB or Maple
3. Ability to interpret numerical results
4. Ability to understand that there are limits to numerical accuracy

Goal 5 The Ability to Use Mathematical Models to Solve Practical Problems
Specific Learning Objectives to be assessed:

1. Ability to extract relevant information from a practical problem and give a mathematical formulation of the problem
2. Ability to use numerical results to validate (or modify) a model and to understand the limitation of a model
3. Ability to clearly describe models, including an analysis of the strengths and weaknesses of models and their relationship to the underlying problem

Goal 6 The Ability to Read, Understand, and Explicate Journal Articles in Mathematics Related to the Student's Area of Specialty

Goal 7 The Ability to Communicate Mathematics Effectively

1. Ability to explain mathematics orally
2. Ability to write clear mathematical explanations

Goals 1-4 are evaluated for the BA Math/BA Math Preparation for Teaching Programs, Goals 2-5 are evaluated for the BS Applied math Concentrations, and Goals 6-7 are evaluated for the MA/MS Math programs.

Assessment of Student Learning

Goals 6 and 7 are being evaluated in Fall 2010 for MA/MS Math programs. Data was collected during the masters’ student thesis/writing project defenses from the past 3 years. This data is now being evaluated by the graduate curriculum committee. Any suggested changes will be discussed in Spring 2011 and implemented in Fall 2012 (or later).

Data is being collected in Fall 2010 for the BA Math/BA Math Preparation for Teaching programs regarding Goal 5 in Math 108 Introduction to Proof using embedded exam questions to see how well this goal is being met. Once this data is obtained it will be evaluated by the Undergraduate Curriculum Committee in Spring 2011 and any suggested changes will be considered by the entire department for implementation in Fall 2011 (or later).

Data will be collected in Spring 2011 for the BS Applied Math programs regarding Goal 5 in Math 178 Mathematical Modeling using embedded exam questions to see how well this goal is being met. Once this data is obtained it will be evaluated by the Undergraduate Curriculum Committee in Fall 2011 and any suggested changes will be considered by the entire department for implementation in Spring 2012 (or later).

Course learning objectives are being reviewed for all Math Dept courses by the appropriate course committees.

GE Assessment is ongoing for all designated Math Dept GE courses (Math 8, Math 10, Math 19, Math 100W).

Assessment of Math Dept service courses is ongoing. Presently there are discussions with departments in the College of Business, Aviation, Nutrition and Food Science, and Economics regarding the appropriate learning objectives for Math 71 Calculus for Business and Aviation. We are continuing to implement workshops in many lower division math courses to help students master the learning objectives in these courses. Voluntary workshops were first offered in Math 8 College Algebra, Math 32 Calculus III, and Math 71 Calculus for Business and Aviation during Fall 2010. A voluntary workshop for Math 42 Discrete Math will be first offered in Spring 2011.

The Math Dept chair is meeting with the provost and other administrators regarding the last Math Dept external review in Spring 2009 in December 2010.

### SCHEDULE OF ASSESSMENT ACTIVITIES*

**BA Math, BA Math Preparation for Teaching**

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**BS Applied Math**

- Concentration in Applied and Computational Math
- Concentration in Economics and Actuarial Science
- Concentration in Statistics

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MA Math, MS Math  
C = Collect data  
D = Discuss results  
I = Implement changes (if any)

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**MS Statistics**

An assessment plan for the MS Statistics program which was approved for implementation in Fall 2011 is being developed.