THE UNIVERSITY OF NORTH CAROLINA AT ASHEVILLE

FACULTY SENATE

Senate Document Number   3012S

Date of Senate Approval   02/09/12

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Statement of Faculty Senate Action:

APC Document 20:   **Delete MATH 352, Replace with MATH 452**

Effective Data: Fall 2012

1. **Delete**:   On page 220, the entry for **MATH 352, Introduction to Mathematical Models:**

> **352   Introduction to Mathematical Models (3)**
> The focus of this course is to teach students the application of mathematical techniques to real world problems. Content includes: difference equations, stability analysis and chaos, Markov processes and basic probability theory. Students will be expected to use personal computers for their projects. Prerequisite: MATH 291; or permission of instructor. Odd years Spring.

   Add: On page 221, new course **MATH 452, Introduction to Mathematical Models:**

> **452   Introduction to Mathematical Models (3)**
> The development and analysis of mathematical equations based on real world situations. Special emphasis is given to systems of time-dependent equations, their stability analysis, and the assessment of their relevance to the application. Prerequisite: MATH 394 or permission of instructor. Odd years Spring.

Impact Statement:
The change of the prerequisite raises the expectations of this class and may impact the enrollment slightly. By having taken MATH 394, Differential Equations, students will be better prepared for the topics of the class. Since MATH 394 is a required course that many students take early, most students interested in Mathematical Models will have had the prerequisite. This change will not have major resource implications.

Rationale:
The new course reflects the present content of the class. These topics can be better understood with some background and knowledge of MATH 394, Differential Equations. Mathematics majors interested in applying Differential Equations to real world problems will be able to understand the modeling process better if they had some exposure to Differential Equations prior to the course. Thus, students will be able to investigate this topic in greater depth. (NOTE: Prior to 1990, this course was numbered 452.) This catalogue change is part of a restructuring of UNC Asheville's applied mathematics concentration. MATH 452 will be one option that students can choose as a course sequence.

The rationale for returning the modeling class to the 400 level is similar to the reasoning for the Numerical Analysis course. Since we have added a 300-level prerequisite, it seems appropriate that a subsequent course has a higher number. A more important reason is that we are increasing the complexity of the material and expect students taking this class to have a high degree of mathematical sophistication. The 400-level will advertise to students our expectations.