Studying for the Mathematics

Knowing how to approach the material is the first step in succeeding in a math course at UMBC. The amount of material covered, and the speed at which it is covered, may seem overwhelming; but if you follow these guidelines, your stress level will decline as your success increases.

• Take material from the course and apply it to solve problems. (Application)
  o Lectures
    ▪ Before class review ideas from the previous section and read over the section to be covered.
    ▪ Learn to apply concepts by practicing problems during class (while taking notes or during time set aside for this).
    ▪ If class time is set aside, ask questions when you have trouble, or ask the teacher before or after class.
    ▪ After lecture cement each technique by trying other example or homework problems with the same concept.
  o Book
    ▪ Work through examples in the text until you understand the steps.
    ▪ Work homework problems using methods introduced in the text.
    ▪ Try to complete all homework problems after you understand the techniques to produce repetition that will improve your ability to do entire problems correctly and cut down on silly mistakes.
    ▪ If you can’t solve the problems yourself and read the solution in the solution manual, wait a day and try the problem again.

• Identify which tools need to be used for a problem. (Analysis)
  o After getting a grasp for a particular technique or tool, write down which types of problems use that tool.
  o Find identifying features, such as key words or phrases, used in each type of problem to be able to choose the proper tool.
  o Ask yourself, how did I know how to do that problem?
  o For each chapter and before each test, make a chart of the different types of problems, a way to identify the type of problem, and the tool(s) used to solve the problem.

• Solving problems using multiple tools (Synthesis)
  o Some test and exam problems require the use of multiple techniques from different sections of the course or use complicated techniques that are built upon a number of techniques learned earlier in the course.
  o Practice breaking down homework or review problems into multiple parts and listing the techniques used for each part.
  o Review and practice difficult techniques that are used in many types of problems.
  o A good source for these types of problems is the review section of each chapter.

• Solving conceptual problems. (Evaluation)
  o Some problems do not ask you to use tools you have learned in the course but want you to apply concepts in a new way. These problems require an understanding of the ideas underlying the techniques and tools used to solve problems.
  o Write down the concept or idea behind each tool or technique.
  o Connect the concept to other concepts used in the course, i.e. which other concepts are needed to understand Concept A and which other concepts are dependent on Concept A.
  o Try to understand why the idea is true and what the concept means.
  o If concept is difficult to understand, ask professor, tutor, help room teacher, or other student to explain the concept, then look for opportunities to explain the concept to another student.
  o Create a concept map for the chapter or course and update it when new concepts are learned.
  o As you work a problem using techniques connected to the concept, make sure the method of solving makes sense: Are there other more efficient or better methods?
  o Create your own conceptual problem using the concept.
  o Identify and practice any conceptual problems on review sheets, old tests, or in the book.