MATH 300
Introduction to Abstract Mathematics

E. Lee May, Jr., Ph. D., Professor
Office: Room 138, Henson Science Building
Telephone: 410-543-6464 Cell/Text: 443-735-7351 Fax: 410-548-5559
e-mail: *elmay@salisbury.edu*

Office Hours
10:00 - 10:50 a.m. on Monday through Friday
(I am available at other times by request.)

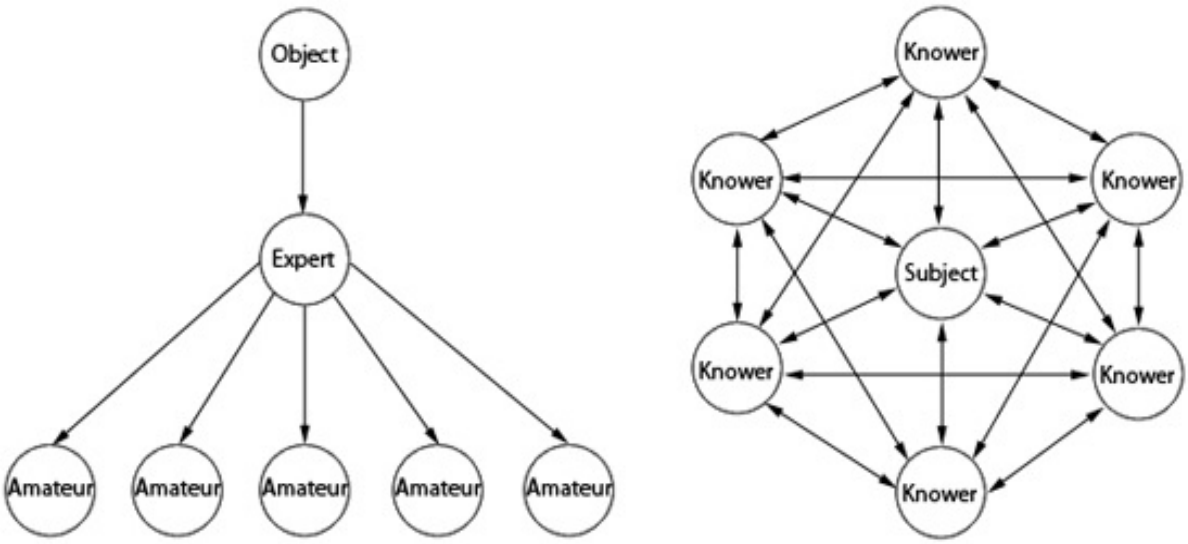
Overview and Policies of the Course

The Subject

This course consists of a study of some concepts that are fundamental to mathematics. It has several purposes. One is to provide a bridge from the computational courses of the first two years to the abstract ones of the final two. A second is to serve as a capstone for students concentrating in elementary education. A third is to improve the ability of anyone who takes it to reason logically and think critically. (For more information about the objectives and content of the course, see the syllabus.)

In this course, we will learn mathematics as professional mathematicians do. That is to say, we will inquire: we will prove theorems and raise and test conjectures. I will almost never lecture. The notes that I hand out form the backbone of our study. Your assignment for the next class is, solely on your own[1], to solve the Problem 1 of the notes, and to come to class prepared to explain your solution, at the board, to the rest of the class. If, between today and the next meeting of the class, you accomplish that first task and have more time that you would like to devote to the course (put at least two hours of homework into the course for each hour of class), then try to complete Exercise 1. When we next get together, at least one of the people who have solved Problem 1 will be asked to present his or her solution. If we finish with that and there is time left in the period, someone who has completed Exercise 1 will be asked to present, and so on. This is how almost every one of the meetings of the class will proceed. (For an illustration of the workings of this class, as well how it differs from a so-called lecture class, see the figure at the top of the next page.)

[1] Note: you are never to use a book in this course without first receiving permission from me.



(1)[2] **(2)**[3]

Figure. Learning by (1) Lecture and (2) Inquiry.

Administrative Matters

Evaluation of Your Work. Your performance in the course falls into four categories: presentations and other work in class, a portfolio of some of your written work, and midterm and final examinations. I will evaluate your presentations and other participation by keeping a diary of each day's class. My evaluation of your presentations at the board or in my office, and of other comments that you make in class or in my office, will count as *b*% of your final average, where *b* is a number chosen by you so as to satisfy the conditions to be presented below.

The portfolio of your written work must contain your own writeups of proofs of five theorems from the course. It may contain also exercises from the notes that we have not covered in class. It may contain one or more conjectures and work that you have done – examples, proofs, or commentary, for example – to try to decide whether the conjectures are true or false. The portfolio may also contain journal- or diary-like comments by you on your work and what goes on in class.

---

1. Parker Palmer, *The Courage to Teach* (San Francisco: Jossey-Bass, 1998) 100.

2. *Ibid.*, 102.

There is no maximum length to the portfolio. The minimum length is five (not-necessarily-full) pages, one for each theorem that you include. With the exception of mathematical symbols and illustrative diagrams, the portfolio should be typed in at least 12-point font with double spacing. The spelling and grammar should be error-free. Mathematical symbols and any diagram that you choose to include may be handwritten or drawn in the document. (For examples of a style in which to compose your portfolio, consult *Mathematics Magazine*, *The College Mathematics Journal*, *The American Mathematical Monthly*, or some other reputable journal of mathematics.) The portfolio will count as p% of your final average, where p, like b, satisfies the conditions below.

The midterm and final examinations will count as m% and f %, respectively, of your final average. The numbers p, b, m, and f must satisfy the following conditions:

each of p, b, m, and f is an integer;

p is in [10,30], b is in [30,70], and each of m and f is in [0,15];

$p + b + m + f = 100$.

Let me know your choices for p, b, m, and f not later than Wednesday, September 9. You may change your choices once, something that must occur within a week of my returning to you your graded midterm examination.

The grading scale for the course is as follows:

90 - 100, A;
80 - 89, B;
70 - 79, C;
60 - 69, D;
< 60, F.

The Integrity of Your Work. I expect you to conduct yourself with honor, integrity, and respect for every member of the class, including yourself. By presenting or turning in a piece of work, you will be pledging that you have neither given nor received any unauthorized help on the work. My response to discovering a violation of this pledge might include, but will not necessarily be limited to, the following:

(1) assigning a score of *0* on any offending work;
(2) assigning a grade of *F* for the course;
(3) reporting each cheater to an appropriate authority, such as the Provost.

Attendance. Regular attendance of, and participation in, class is a very important part of this course. Nevertheless, because I believe that university students should make their own decisions, I hereby declare that attendance of the class meetings of this course is optional, subject to the conditions below.

(1) The student and not the professor is responsible for the

consequences of an absence. This means, for example, that I will not be obligated to repeat to an absentee material that has already been covered. An exception to this rule is the following: if a student voluntarily leaves class because he or she wishes to work further on some of the assigned work without seeing others' results, I will go over with him or her anything that was missed thereby.

(2) A test from which a student will be or was absent may be made up only when the absentee can convince me, preferably in advance, of the necessity and worthiness of the absence.

(3) Assigned homework that is late will not be accepted.

Regarding Learning Styles and Difficulties. There are many styles of learning. Some people learn better with their eyes, some with their ears. There are many effective ways to acquire knowledge. If, however, you have a learning style that seems to you to be significantly different from that of most people – in particular, if you have a learning disability – please let me know. If, for example, taking notes in class is difficult for you or hampers your learning, arrangements can almost certainly be made to help you solve this problem.

Some Thoughts at the Beginning of a Semester

I want to help you learn. I will help you with any legitimate need. I will not help you with anything that you need to do for yourself. I want this course to be an enjoyable experience for all of us, and I will do all I can to make it so.

I am making certain assumptions about you. You are here because you want to be, even if only to satisfy a requirement. You want to learn the material of this course, at least to the point of earning an acceptable grade. You already know, or you are willing to rediscover, that learning in general, and mathematics in particular, is fun. *You will, throughout the semester, invest at least two hours of time outside class for each hour of class-time in playing and working with the ideas of this course.* (If you do not possess all of these characteristics and you are unable or unwilling to develop them, then you should probably drop this section of the course.)

If at any time you would like to discuss this course, this university, or any other aspect of your life, I would be happy to do so with you. I am excited about mathematics, computer science, and teaching; and I enjoy university students. I look forward to getting to know you as, together, we enjoy a semester of diligent and productive study, and mastery, of the theory of linear point-sets.

E. Lee May, Jr., Ph. D.
Professor of Mathematics and Computer Science