

Syllabus for Math 214 (Sec. 02)

Foundations of Mathematics

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Course Web Site: www.math.wm.edu/~tomforde/Math214.html

Office Hours: MWF 10:00AM – 11:00AM
 Th 1:00PM – 3:00PM
 (or by appointment)

Note About Office Hours: I encourage you to come by my office if you have any questions, need help with homework problems, or would just like to talk about the material. If for some reason you are unable to make it to Office Hours, you are welcome to email me to set up an appointment for another time.

Meeting Times: Lecture: MWF 12:00 – 12:50PM in Jones 302.

Course Description: This course was created several years ago in response to student requests. Students wanted two things: first, an introduction to proofs and the abstract approach that characterizes even the most application-oriented of upper level mathematics courses; and second, some preparation for Math 307 (Abstract Algebra) and Math 311 (Elementary Analysis), which are required in the mathematics concentration.

Math 214 is intentionally designed to be more theoretical than other 100 and 200 level courses. It is also meant to serve as a transition from the introductory math courses at the 100 and 200 level, to the more advanced courses at the 300 level and above.

The focus of Math 214 is proofs. This involves many aspects. Throughout this course you will be responsible for reading, understanding, creating, and writing proofs. Throughout the course there will be great emphasis placed on communication and writing. It is not enough to simply know to solve a problem — you are also responsible for explaining that solution and communicating it in writing. The goal is to produce students at the end of the course that can write proofs in a style that is acceptable to mathematicians. What style is that? The text is a good model, and I will try to make sure that my presentations in class are organized in a way that I would like you

to follow in your own proofs. At the outset, however, there are three things that you should be aware of:

- (1) Writing mathematics requires full English sentences, with the understanding that certain mathematical symbols can replace the words they represent (so that the phrase “ x is a member of the set of real numbers and x^2 is not equal to 4” may be written as “ $x \in \mathbb{R}$ and $x^2 \neq 4$ ”).
- (2) When you write up a proof I will grade it for the way it is written as well as the ideas that are in it. Consequently, you should follow the rules of English usage, such as using proper grammar and punctuation.
- (3) Your proofs will be graded on the degree to which they are: Correct, Clear, and Concise

As you learn to write proofs in this course we will also introduce basic ideas, constructs, and techniques that are ubiquitous throughout all areas of mathematics. These topics include (1) Logic and Propositional Calculus, (2) Set Theory, (3) Relations, (4) Functions, (5) Cardinality, and (6) Various Number Systems (e.g. integers, rational, real, and complex numbers). These are concepts that will not only help you to think more logically (and consequently write better proofs), but this is also fundamental material that you will see again and again in any upper level mathematics course that you take.

Text: The textbook used for this course is *A Transition to Advanced Mathematics (6th Ed.)*, by Douglas Smith, Maurice Eggen, and Richard St. Andre.

Course Web Page: The course web page is located at

www.math.wm.edu/~tomforde/Math214.html

On the course web page you will find the homework as it is assigned, as well as a copy of this syllabus, exam dates, and announcements as they are made.

Grading: The final grade for the class will be determined as follows:

Class Participation:	5%
Homework:	25%
Exam 1:	20%
Exam 2:	20%
Final Exam:	30%

Attendance: It is vital to attend every lecture and take careful notes. Some lecture material does not appear in the textbook. Questions on the exams will be drawn from homework, reading, and lectures. I also encourage you to ask questions and participate in class. As stated above, 5% of your final grade will be based on class participation.

Reading: Reading assignments will be given weekly on the course web page. Completing the reading assignments is just as critical as doing the written homework. If you are unfamiliar with reading a textbook in a mathematics class, I have written up some tips on how to go about this. These tips can be found on the “Miscellaneous Resources” portion of the course web page.

Homework: A list of homework problems will be given every week on the course web page. Each week I will give you a list of homework problems to be turned in and graded, as well as a list of problems that will give you additional practice but do not have to be turned in.

With regards to the homework that is turned in, the following policies will be in effect:

- Homework without a name will not be graded.
- Please write on only one side of the paper. Failure to do so will result in a deduction of 20% of the homework score.
- If your homework is more than one page it should be stapled in the upper left-hand corner. Unstapled homework will result in a deduction of 20% of the homework score.
- Homework is due at the beginning of class on Mondays. Late homework will not be accepted.
- Homework that is not picked up within two weeks of the date it is handed back will be discarded.
- Your lowest homework score throughout the term will be dropped when calculating your final grade.

Exams: There will be three exams: two midterm exams during the semester and one final exam at the end of the semester. Each exam will consist of two portions: A take-home portion worth 100 points, and an in-class portion worth 50 points. The dates of the in-class portions of the exams are

In-Class Exam 1: Friday, Feb. 24 from 12:00–12:50PM in class.

In-Class Exam 2: Friday, Apr. 7 from 12:00–12:50PM in class.

Final: Wednesday, May 3 from 8:30–11:30AM, location TBA.

The take-home portion of each exam will be given to you approximately one week before the in-class portion, and it will be due at the time of the in-class portion. It is William & Mary policy that final exams are not subject to rescheduling, so please do not make plans to leave campus until after the final exam time.

Makeup Policy: In general, missing the In-Class portion of an Exam or not turning in the Take-Home portion of an Exam when it is due results in a score of zero, and you will not be allowed to make up the work. Exceptions may be made in the case of extreme circumstances, such as a documented, serious illness. In the event that you cannot be present for an exam, and you believe your circumstances warrant special consideration, you need to speak to me *in advance*, and you need to take the exam *before* (and not after) the rest of the class.

Honor Principal: William & Mary students are expected to adhere to the honor principal. In this course this shall mean the following: Homework can and should be worked on and discussed with others. However, the write-up should be independent and in your own words. In addition, exams (including take-home exams) shall be worked on independently. You are allowed to use your textbook and class notes for the take-home portion of the exams, but the in-class portion of the exams is closed books and closed notes. Until the exams are graded you are not allowed to discuss the problems with anyone except the instructor. In addition, if you are aware of anyone who is cheating or receiving unfair, outside assistance, you are honor bound to inform the instructor of what is occurring.

Special Needs: Any student with a disability or chronic health problem for whom special accommodations would be helpful is encouraged to discuss with the instructor the types of assistance that might be offered.