Calculus and Analytic Geometry - MTH 33. Section E01 – 20088

Professor: Dr. Luis Fernández
Class times and room: Mon, Wed, 18:00–20:25, CP 308.
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Overview of the course.
This course will provide some advanced tools that you will need in your future studies. **It is important that you master these tools as you will need them in your next courses.**

Some resources:
- **Classes:** One purpose of attending classes is to learn faster than if you study on your own with a book. In addition, classes have the advantage of being interactive: you can ask if you need a clarification. To take full advantage of classes you need to review the previous class and look at the material that will be covered in the next class, and try some of the exercises. It is essential that you **do all the mandatory exercises** assigned for each class (see next page). Otherwise you will forget what you learn in the class.
- **Math Tutorial Lab:** The Math Tutorial Lab is a room where you will find permanent tutors for all maths courses. If you want to have the opportunity to ask questions as they arise while you do your homework, this is the place to go. It is located at CP 303 and opens 10–8 Monday to Thursday, 10–5 Friday, and 10–3 Saturday and Sunday.
- **Meetings with the instructor:** If you have not understood something well and need help, or for any other matters concerning the course, you can also talk to the instructor. Please write an e-mail to the address above to arrange a time, or go to office hours.
- **Computer algebra programs:** Students are strongly encouraged to use computer algebra software (such as Maple, Mathematica, Matlab, etc) in this class. The university has computers where you can use these software.

Textbook:
- *Calculus (Sixth Edition)*, by James Stewart. Publisher: Brooks/ Cole. NOTE: there is a version that only has multivariable calculus. Also, if you have the 7th edition (which is more expensive) it is also good, but let me know.

Student's responsibilities
- To use the **resources** available (some are above) to attain the main goal: <u>to learn</u>.
- To **prepare** each class by studying the material in the previous class, solving the recommended exercises and reading ahead in the text (or in internet) the material that will be presented.
- To work on many **exercises**, as it is impossible to learn mathematics without doing so. The main purpose of the exercises is not quite to find the answer, but to learn from them. Therefore, if you work in an exercise for a long time without finding a correct answer, do not feel frustrated, instead consider how much you have learned in the process.
- To **ask** questions during classs or tutorials about anything that has not been understood. EVEN IF YOU THINK THAT YOUR QUESTION IS TOO TRIVIAL, I GUARANTEE THAT MANY OTHER STUDENTS WILL BENEFIT FROM THE ANSWER. So when in doubt do your classmates a favor and ASK!

Instructor's responsibilities
- To act as *facilitator* of the learning process of the students, and to assist with any question that students may have about the material.
- To give tests and exams of appropriate difficulty. To grade tests and exams promptly and explain the students the meaning of their grades.

Classroom Rules
- **Tests will not be repeated.** The only exception is if the instructor receives **notice** of the absence (via e-mail, telephone, friend, etc) **on the day of the test or quiz**.
- Cell phones, music devices and laptops are not allowed during class time.
- Talking about matters not related with math is not allowed during class time. Students must be quiet except when discussing mathematics during class time. It is strongly encouraged, however, that students participate and discuss the subject that is being studied in each class.

Exams and homeworks:
- There will be **three tests** during the term, **each worth 20%** of the final grade.
- **Homeworks** will be assigned each week. It is your obligation to **do the homework**. If you want to hand it in, it will count as **extra credit**.
- The **final exam** will count **40%** of the final grade.

Class plan and assigned exercises. MTH 33. Professor Luis Fernández

Use this to prepare each class in advance. Note that dates may change depending on how fast we advance.

DATE	SECTION	MANDATORY EXERCISES
Mo 1/28	12.1. Sequences	p. 720: 13 – 55 odd
We 1/30	12.2. Series	p. 730: 1-5, 7, 8, 9, 15-19, 43 – 47 odd
Mo 2/4	12.3. The Integral Test	p. 739: 1 – 25 odd
We 2/6	12.4. The Comparison Tests	p. 770: 15 – 29 odd, 41, 43, 45
Mo 2/11	12.5. Alternating Series 12.6. Absolute Convergence and the Ratio and Root tests	p. 749: 1, 3, 7, 9, 11, 15, 17, 19, 21 p. 755: 7 – 37
We 2/13	12.7. Strategy for Testing Series	p. 758: 1, 2, 3, 4, 7, 11, 13, 21 – 37 odd
Mo 2/18	NO CLASS: PRESIDENT'S DAY	
We 2/20	Review and FIRST TEST	p. 796: 1 – 43 odd. Test from 12.1 to 12.7
Mo 2/25	12.8. Power Series	p. 763: 1 – 31 odd
We 2/27	12.9. Representation of Functions as Power Series 12.10. Taylor and Maclaurin Series	p. 769: 5 – 39 odd p. 782: 1 – 31 odd, 43, 45, 71
Mo 3/4	12.11. Applications of Taylor Polynomials	p. 791: 1 – 25 odd
We 3/6	13.1. Three- Dimensional Coordinate Systems 13.2. Vectors	p. 805: 1–13 odd, 17, 19, 21, 23-31 odd p. 813: 5 - 29 odd
Mo 3/11	13.3. The Dot Product 13.4. The Cross Product	p. 820: 3 – 47 odd p. 828: 1- 43 odd
We 3/13	13.5. Equations of Lines and Planes	p. 838: 7 – 45 odd
Mo 3/18	Review and SECOND TEST	p. 849: 1 – 13 odd. Test from 12.1 to 12.7
We 3/20	14.1. Vector Functions and Space Curves 14.2. Derivatives and Integrals of Vector Functions	p. 858: 1 – 25 odd p. 864: 1 – 29 odd
Mo 3/25	NO CLASS: SPRING RECESS.	
We 3/27	NO CLASS: SPRING RECESS.	
Mo 4/1	NO CLASS: SPRING RECESS.	
We 4/3	14.3. Arc Length and Curvature Review	p. 904: 1 – 41 odd p. 918: 1 – 5 odd, 9 – 13 odd
Mo 4/8	15.1. Functions of Several Variables 15.2. Limits and Continuity	p. 902: 3 – 19 odd p. 912: 1 – 37 odd
We 4/10	15.3. Partial Derivatives 15.4. Tangent Planes and Linear Approximations	p. 924: 11 – 33 odd, 45 – 73 odd p. 935: 1 – 23 odd
Mo 4/15	15.5. The Chain Rule	p. 943: 1 – 35 odd
We 4/17	15.6. Directional Derivatives and the Gradient Vector	p. 956: 7 – 33 odd
Mo 4/22	15.7. Maximum and Minimum Values	p. 997: 5 – 17 odd, 27 – 33 odd
We 4/24	Review and THIRD TEST	p. 981: 1 – 45 odd. Test from 12.1 to 12.7
Mo 4/29	16.1. Double Integrals over Rectangles 16.2. Iterated Integrals	p. 994: 1 – 15 odd p. 1000: 3 – 31 odd
We 5/1	16.3. Double Integrals over General Regions	p. 1008: 3, 7, 15, 17, 19, 25, 27
Mo 5/6	16.4. Double Integrals in Polar Coordinates	p. 1014: 1, 7, 9 – 27 odd
We 5/8	16.7. Triple Integrals	p. 1034: 1, 3, 9, 11- 19 odd
Mo 5/13	Review	p. 1058: 3, 7, 9, 11, 15 – 27 odd
We 5/15	Review for the final	

REMEMBER: The exercises listed correspond to the material that will be covered on the date they are listed.

Before each class, read the section that corresponds to that class and attempt some of the exercises. This way when you hear the explanations in class, you will understand the material much better.