

**Course Title : Differential and Integral Calculus  
(Unique number : 54960, 54965)**

- Instructor: Moon-Jin Kang  
Lectures : MWF 9am - 10am in ECJ 1.202  
Office Location : RLM 10.164  
Office hours: Monday 10am - 12pm  
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- Teaching Assistant : Urmi Nayak  
TA sessions : TTH 8:30am - 9:30am in UTC 1.116  
TTH 2pm - 3pm in ECJ 1.204  
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Office hours: Friday 10am - 1pm  
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## Course Description and Prerequisites

This course may be used to fulfill the mathematics component of the university core curriculum and addresses the following three core objectives established by the Texas Higher Education Coordinating Board: communication skills, critical thinking skills, and empirical and quantitative skills.

The syllabus for M408C includes most of the basic topics in the theory of functions of a real variable: Algebraic, trigonometric, logarithmic and exponential functions and their limits, continuity, derivatives, maxima and minima, integration, area under a curve, and volumes of revolution.

For more information on prerequisites, please see

<https://www.ma.utexas.edu/academics/courses/syllabi/M408C.php>

For important dates, please see

<http://registrar.utexas.edu/calendars/14-15>

## Grade composition

Homework : 20 percent

1st exam(October 15) : 20 percent

2nd exam(November 19) : 20 percent

Final(December 12) : 40 percent

**Academic dishonesty will not be tolerated and will result in a penalty of at least an F in the course.**

## Homework

There will be weekly homework assignments posted on Quest system :

<https://quest.cns.utexas.edu/>

To submit, you must enter your answers in Quest. The usual format will be multiple choice. Quest will immediately tell you if your answer is correct or not.

You are allowed multiple tries, but there will be a reduction of points after each unsuccessful attempt. There will be absolutely no acceptance of any late submissions. The deadlines posted on Quest are definite, and sharp to the minute. Usually, the homework will be **due at 11:59 PM (one minute before midnight) on every Tuesday (the first due is on September 9th)**.

## Exam

1st exam, 9am - 10am on October 15 in ECJ 1.202

2nd exam, 9am - 10am on November 19 in ECJ 1.202

Final exam, 9am - 12pm on December 12, Location : TBA

Please remember exam dates, there will absolutely be No make-up exams! The final exam is scheduled by the University. See <http://registrar.utexas.edu/schedules/149/finals>

## OFFICE HOURS @ CALCLAB

CalcLab is an "office hour pool". It is a space that will operate for twenty-five hours per week, from 2 PM until 7 PM Monday through Friday, starting on September 2, 2014.

It will always be staffed by several TAs and LAs (undergraduate Learning Assistants). Students from any calculus class can come to CalcLab whenever it is open, to get assistance with homework, test preparation, etc.

CalcLab schedule (with a few exceptions announced here):

M-F, 2 PM- 7 PM, PAI 5.39

There are a few exceptional days with a different schedule, please see here:

<https://www.ma.utexas.edu/academics/undergraduate/calculus-lab/>

Each room has a large capacity, and will be equipped with multiple black/white-boards, spaced out so that several separate groups of students can do board work simultaneously.

## Tutoring

The UT Learning Center offers tutoring services to calculus students. Some resources are posted online on their website

[http://www.utexas.edu/student/utlc/learning resources/](http://www.utexas.edu/student/utlc/learning%20resources/)

UTLC also offers Drop-In Tutoring, a free, walk-in study environment supported by mathematics tutors. Additionally, they offer appointment tutoring, consisting of one hour, individualizing tutoring sessions for a fee. For detailed information, please see

<http://www.lifelearning.utexas.edu/>

## Special Accommodations and Support

The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact the Office of the Dean of Students at 471-6259, 471-4641 TTY. Moreover, should you become very stressed and overwhelmed, please consider contacting the following service: Counselling and Mental Health Center  
Student Services Bldg (SSB), 5th Floor  
Hours: M-F 8am-5pm  
Phone: (512) 471 3515  
www.cmhc.utexas.edu

## Schedule

**Textbook: Stewart Calculus, Early Transcendentals, Seventh Edition.**

The numbering below corresponds to chapters in the textbook. This schedule is tentative, so can be changed. It is your responsibility to keep track of any changes as the semester progresses.

### **1. Functions and Models (3 Lectures: Aug 27, 29, Sep 3)**

1.5 Exponential Functions

1.6 Inverse Functions and Logarithms

### **2. Limits and Rates of Change (6 Lectures: Sep 5, 8, 10, 12, 15, 17)**

2.1 The Tangent and Velocity Problems

2.2 The Limit of a Function

2.3 Calculating Limits Using the Limit Laws

2.4 The Precise Definition of a Limit

2.5 Continuity

2.6 Limits at Infinity; Horizontal Asymptotes

2.7 Derivatives and Rates of Change

2.8 The Derivative of a Function

### **3. Differentiation Rules**

**(10 Lectures: Sep 19, 22, 24, 26, 29, Oct 1, 3, 6, 8, 10)**

3.1 Derivatives of Polynomials and Exponential Functions

3.2 The Product and Quotient Rules

3.3 Derivatives of Trigonometric Functions

3.4 The Chain Rule

3.5 Implicit Differentiation

3.6 Derivatives of Logarithmic Functions

3.7 Rates of Change in the Natural and Social Sciences

3.8 Exponential Growth and Decay

3.9 Related Rates

3.10 Linear Approximations and Differentials

3.11 Hyperbolic Functions

- **1st exam on Oct 15 (review on Oct 13).**

**4. Applications of Differentiation****(8 Lectures: Oct 17, 20, 22, 24, 27, 29, 31, Nov 3)**

- 4.1 Maximum and Minimum Values
- 4.2 The Mean Value Theorem
- 4.3 How Derivatives Affect the Shape of a Graph
- 4.4 Indeterminate Forms and L'Hopital's Rule
- 4.5 Summary of Curve Sketching
- 4.7 Optimization Problems
- 4.9 Antiderivatives

**5. Integrals (5 Lectures: Nov 5, 7, 10, 12, 14)**

- 5.1 Areas and Distances
- 5.2 The Definite Integral
- 5.3 The Fundamental Theorem of Calculus
- 5.4 Indefinite Integrals and the Net Change Theorem
- 5.5 The Substitution Rule

- **2nd exam on Nov 19 (review on Nov 17)**

**6. Applications of Integration (6 Lectures: Nov 21, 24, 26, Dec 1, 3, 5)**

- 6.1 Areas between Curves
  - 6.2 Volumes
  - 6.3 Volumes by cylindrical shells (optional)
  - 6.4 Work (optional)
  - 6.5 Average value of function (optional)
- (We will discuss a selection of topics marked as "optional", but not all of them)

Last updated: September 1, 2014