**Syllabus MAT 221 - Calculus I**

**Fall 2018, Section 02**

**Instructor**: Xiuquan Wang **Schedule**: 2:00 - 2:50 MWF

**Office**: K – 1 **Room:** K - 226

**Phone**: (601) 977-6164 (O) **Office Hours:** Attached

**Email**: xwang@tougaloo.edu

**Required Materials:**

Textbook: James Stewart. Calculus: Early Transcendental Functions (8th Edition),

Options to buy the course textbook:

This is available as a package consisting of the book and 6 months access to WebAssign from the publisher for $171.95, with ISBN number 9781305616691. The same package is available at the bookstore and from other sellers, possibly with a lower price. If you already have a copy of the book, or only want an electronic version, you can get this together with Cengage Unlimited from the publisher for $119.99. Note that this price includes access to all textbooks in the Cengage library, some of which may be used in other Tougaloo courses.

Access to WebAssign and the eBook version of the textbook for one semester can be purchased directly from WebAssign after enrolling in the appropriate class there. The price is $100 for one semester, $125 for multiple terms (usable if you take more than one semester of Calculus). Cengage Unlimited includes access to WebAssign. It is no longer possible to purchase just access to WebAssign, it is sold together with the eBook.

**Course Description:**

This is a first course in the calculus of functions of one independent variable. Topics include the basic analytic geometry of graphs of functions, and the properties of functions, including limits, continuity, derivatives and basic integration. Applications to the biological and social sciences will be discussed, and the course is designed to meet the needs of students in these disciplines.

**Additional Details:** This course is part of a four course sequence and precedes MAT 222 Calculus II. Students planning to take this course must demonstrate a proficiency in pre-calculus, either through the successful completion of a prior course in pre-calculus (such as MAT 103) or by achieving an adequate score in the Placement Exam I offered by the Mathematics Department. This sequence of courses is considered foundational to all higher-level courses in mathematics. This sequence satisfies a core requirement of two semesters of single variable calculus for both the major and minor in mathematics.

**Final Grade Components**

|  |  |  |
| --- | --- | --- |
| **Component** | **Points** | **Weightage** |
| **Homework (10)** | **15 point each** | **15%** |
| **Quizzes (10)** | **15 point each** | **15%** |
| **Midterm Exams (2)** | **100 point each** | **20% each (40% in total)** |
| **Final Exam** | **200 points** | **30%** |
| **Total** | **700 points** | **100%** |

Letter grade will be determined as follows:

|  |  |
| --- | --- |
| **Percentage** | **Letter Grade** |
| **88%-100%** | **A** |
| **75%-87%** | **B** |
| **62%-74%** | **C** |
| **50%-61%** | **D** |
| **Below 50%** | **F** |

**General Policies and Information**

**Homework:** I will assign homework from the sections as we discuss them. It is imperative that you keep your studies current. If needed, we will discuss questions over homework that you have attempted at the beginning of each meeting. Be sure that you are prepared to ask questions over material that we discussed in the previous meeting. You should come to speak with me during my office hours if your questions do not address the section covered in the previous meeting.

Homework is done with Webassign (<https://www.webassign.net/wa-auth/login> ). You will need the following COURSE ID to complete the registration for the online homework.

Course id for Section 01 (I will let you know this id in class)

If you need extension for your homework, you need email me at least one day in advance of the due time. On the due day, I will not give any extension.

**Quizzes**: Once per week, I select one of the previously assigned homework problems (with numbers changed a little to alter the final answer) as a 10-minute, 10-point in-class quiz. ***There are NO makeup quizzes.***

**Exams**: There will be 2 exams (closed book and notes) during the semester and a cumulative final exam: The exams will be showed in details. I may break a longer problem into smaller steps, and have you give an answer at each step. So you can show your work and I can give you partial credit when appropriate.

If you miss a test and have a valid excuse, take make-up exam in one week after you return. Since you have a full semester to arrange any travel plans, they are not an excuse for missing the final.

**Calculators/Other Technology:** A calculator is not required for this course. Calculators can be used to assist with homework. However, the use of calculators or any other form of technology on exams will not be permitted.

**Note to seniors and other students**

If you are taking this course to satisfy the graduation requirements, I cannot treat you any different from any other student. Your final grade is strictly as a result of your performance in homework, quizzes, tests, and other class activities. There is no extra credit.

**Class Structure:**

Part of the class will be used to discuss problems with previous homework assignments. New topics will be introduced and discussed. Quizzes and tests will be given. The students should read the section(s) to be covered before the lecture, and should pay careful attention to what material is being developed in the lecture. Use the lecture as a guide for study. There is a lot of information in the book that won’t be covered in the lecture that is valuable to the student as background information for better understanding of the material he/she is expected to learn.

**Class Attendance:** I will take attendance each class. You must be on time and not leave early. If you miss the roll sheet, it is your responsibility to sign in at the end of class.

**The only absences that are excused are those that are University sponsored.** Please give me appropriate documentation for a University sponsored event or have your sponsor email me. **Absences for illness and funerals count.** An excuse of “family emergency” is not an acceptable excuse for two reasons: 1) They only occur on exams and 2) It is an abused excuse without documentation.

**At the end of the semester, if you have three or fewer absences, you will receive two bonus points on your course average. After 3 classes have been missed, there will be a 1 point reduction in your overall grade for every class missed.**

In case of student illness (absent from class for four (4) consecutive days with appropriate verification) or *immediate* family deaths, you should notify the Center for Campus Life. Please read the policies in the *Student Handbook.* If you are ill or have a funeral of an *immediate* family member, you will be allowed to make up the work missed in a reasonable time frame. ***Remember, absences for illness, family emergencies, and funerals do count.***

If you must be absent, realize that makeup work is your own responsibility. Each student is responsible for all material covered during her/his absence. I will be happy to help you, however, remember that I already lectured on the topics once and I do not want to use office hours for personal lecturing.

**Outside Preparation for Class:** Normally, you should spend approximately 2 hours preparation outside of class for every one hour of lecture. The examples worked out in the book will not be worked through in class. It is assumed the students have the book and can read the worked out examples presented in the text. You should read the material to be covered in the next class prior to coming to class. This is equivalent to at least 6 hours per week for each class you take at TC.

**Communication:** I invite you and strongly encourage you to make use of my office hours. If anytime during the course you need help or special consideration regarding any subject, please do not hesitate to speak with me. The use of information technologies such as email, pictures of your work taken with your phone, and the internet have become routine learning tools. It is imperative that you use email to communicate with me. Accordingly, you must have a TC email account, check it often and Webassign announcements regularly. ***When you contact me via email, please include “MAT 221” in the subject line.***

**Civility in the classroom:** Students are expected to assist in maintaining a classroom environment that is conducive to learning. In order to assure that all students have an opportunity to gain from time spent in class, troublesome behavior will not be tolerated. At a minimum, this includes using cellular phones or beepers, making offensive remarks, reading newspapers, sleeping, **arriving late, leaving early** or engaging in any other form of distraction.

**Honesty:** It is the aim of the faculty of Tougaloo College to foster a spirit of complete honesty and high standards of integrity. “Scholastic dishonesty” includes but not limited to cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student. Please familiarize yourself with “scholastic dishonesty” in the *Student Handbook*.

**COURSE-SPECIFIC LEARNING OBJECTIVES AND CORRESPONDING OUTCOMES**

**1. Apply arithmetic, algebraic, geometric, statistical and/or logical reasoning to solve problems.** In MAT 221 students will develop skills to: (1) explain the concepts of differential and integral calculus, including limits; (2) calculate derivatives, indefinite and definite integrals; Student mastery of problem solving skills will be assessed through homework exercises, in-class quizzes, and examinations.

**2. Represent and evaluate basic mathematical and/or logical information numerically, graphically, and symbolically** In MAT 221 students will learn how to adequately communicate mathematical information in writing, verbally and graphically, by using words, numerical answers, algebraic expressions, logical sentences, as well as graphs and diagrams.

**3. Use mathematical and logical reasoning to evaluate the validity of an argument.** In MAT 221 students will learn how to identify, understand and apply mathematical and logical reasoning to theoretical and applied problems.

**4. Interpret mathematical and/or logical models such as formulas, graphs, tables and schematics, and draw inference from them.** In MAT 221 students will learn to identify and interpret mathematical information contained in formulas, graphs and tables, in particular: (a) formulas for differentiation; (b) applications of derivatives to optimization; (c) applications of integration to area. The development of student interpretative and inference skills will be assessed through homework exercises, in-class quizzes, and examinations.

*College-Level Competency: Students graduating from Tougaloo College should be able to: demonstrate the ability to apply quantitative and logical skills to solve problems. In particular, students who have taken MAT 221 will be able to use the course-specific learning objectives in order to provide individual solutions to mathematical problems and interpret the results in a relevant manner. The assessment of these skills will be conducted via embedded assessments in final exams, senior surveys (GSS) and senior assessments (OSA).*

**LEARNING ASSESSMENT:** Learning outcomes will be assessed through homework exercises and examinations. The following assessments represent a general departmental requirement: - 1). Homework assignments are expected to be given weekly, either as on-line, web-based assignments, or as writing-intensive assignments - 2). It is expected that a test will be given at the end of each major chapter - 3). A common, unique departmental final exam will be given according to the academic schedule established by the college and department, for all the course sections whose primary delivery method is the traditional one (lecture, face-to-face).

*General requirement: The Common Final represents a course requirement. A student who did not complete the Final Examination, but otherwise completed all the other requirements successfully cannot be assigned a passing letter grade (D or higher) unless taking the Final Examination. Each designated instructor has to keep their copy of partial scores and grades for each student, for one calendar year from the date of recording the grade in the web database.*

**Student Safety and Security**

Students who believe they have been harassed, discriminated against, or involved in gender-based misconduct should contact the Title IX Coordinator, Yasmin J. Gabriel, Esq. at **601-977-7718** or via email at **titleIX@tougaloo.edu** for information about campus resources and support services, including confidential counseling services.

As a member of the Tougaloo College faculty, I am concerned about the well-being and development of our students, and am available to discuss any concerns. Faculty are legally obligated to share information with the College’s Title IX coordinator in certain situations to help ensure that the student’s safety and welfare is being addressed, consistent with the requirements of the law. These disclosures include but are not limited to reports of gender-based misconduct, which includes, but is not limited to, the following: sexual assault, sexual harassment, relational/domestic violence, and stalking.

**Accommodations**

If a student has a disability that qualified under the American with Disabilities Act (ADA) and requires services, he/she should contact the Office for Disability Services (ODS) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODS if they are not certain whether a medical condition/disability qualifies.

*Contact Information*:

Office for Disability Services

2nd Floor Jamerson Hall

Tougaloo, MS 39174

Phone; 601-977-7818

**Course Outline:**

The table below shows the concepts the instructor wishes to cover (May be changed arbitrarily). The structure and flow of the class will permit some chapters to be covered more thoroughly than others.

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| **Week** | **Mon.** | **Wed.** | **Fri.** |
| **Week 1:** | Syllabus  Review of Algebra and Trigonometry | Chapter 1  Review of Algebra and Trigonometry | Chapter 1  Review of Algebra and Trigonometry,  QUIZ 1 |
| **Week 2:** | Chapter 2.1  Understanding the Limit | 2.1/2.2  Understanding the Limit  Evaluating Limits Analytically | 2.2  Evaluating Limits Analytically  Quiz 2 |
| **Week 3:** | Labor Day  No Class | 2.3 | 2.3-2.4, |
| **Week 4:** | 2.4,  Limits and Continuity | **Review Test 1** | **TEST 1** |
| **Week 5:** | 2.5  Introduction to Differentiation; | 2.5  Difference Quotient Supplements | 3.1, Quiz 3 |
| **Week 6:** | 3.1  Basic Derivative Rules; Tangent Line | 3.2  Tangent Line  Supplements | 3.2, Quiz 4 |
| **Week 7:** | 3.3  Product and Quotient Rules | 3.3  Product and Quotient Rules Supplements | 3.4,  Understanding the Chain Rule  **QUIZ 5** |
| **Week 8:** | 3.4  Understanding the Chain Rule | **TEST 2 Review** | **TEST 2** |
| **Week 9:** | The Chain Rule: Continued | 3.4, Supplements | 3.4, Supplements |
| **Week 10:** | 3.5  Implicit Differentiation | 3.5, Supplements | Quiz 6 |
| **Week 11:** | 4.1  Extrema; Intervals;  Increasing/Decreasing | 4.1, 4.3  First Derivative Test | 4.3  Concavity  Curve Sketching  Quiz 7 |
| **Week 12:** | 4.4  Concavity  Curve Sketching | 4.4  Second Derivative Test; | **QUIZ 8** |
| **Week 13:** | 3.7  Related Rates; Optimization | 3.7/4.7, Supplements | 4.7, Supplements  **QUIZ 9** |
| **Week 14:** | Thanksgiving | Thanksgiving | Thanksgiving |
| **Week 16:** | **Final Review** | **Final Review** | No Class |
| **Week 17:** | Final Week | ***Final Week*** | ***Final Week*** |

**Office Hours & Communication Strategy:**

* Office hour meetings: Please send an email for an appointment time, giving me block(s) of time in which you are available. These meetings could be individual or group.
* To contact me, you may call my office, drop by my office, or e-mail me. Email is the best way to reach me. I will do my best to reply quickly.
* I will send e-mails to the entire class during the semester. Check your TC e-mail account frequently.

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| --- | --- | --- | --- | --- | --- |
|  | Monday | Tuesday | Wednesday | Thursday | Friday |
| 8:00-9:00 | Off Campus | Off Campus | Off Campus | Off Campus |  |
| 9:00-10:00 |
| 10:00-12:00 | Office Hour  K - 1 |
| 12:00-2:00 | Office Hour  K - 1 | Office Hour  K - 1 |
| 2:00-2:50 | MAT 221  RM # K 226 | MAT 221  RM # K 226 | MAT 221  RM # K 226 |
| 3:00-3:50 | MAT 316  RM # K - 1 | MAT 316  RM # K - 1 | MAT 316  RM # K – 1 |
| 4:00-4:50 | MAT 426  RM # K - 1 | MAT 426  RM # K - 1 | MAT 426  RM # K - 1 |