**Lincoln University**

**Department of Mathematical Sciences**

**Master Course Syllabus**

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Title:** | **Calculus I**  | **Course number:** | MAT121 |
| **Credit Hours**  | 4 | **Prerequisite (s):** | MAT111 |
| **Term:** |  | **Co-Requisite (s)** |  |
| **Course Method** |  | **Meeting day and Time:** |  |
| **Instructor:** |  | **Classroom/lab/Studio Location:** |  |
| **Office location:** |  | **e-mail:** |  |
| **Office Hours:** |  | **Phone Extension:** |  |

**COURSE DESCRIPTION:**

This is the first course in the calculus sequence designed for students intending to major in mathematics, the natural sciences, and engineering. The topics covered will include: limits and continuity; derivatives rules of algebraic and trigonometric functions; applications including graphing of functions, related rates and optimization; antiderivatives, integration, and the technique of substitution.

**REQUIRED TEXT:**

Larson, R. & Edwards, B. Calculus, 10th Edition. Brooks Cole (2013)

**REQUIRED MATERIALS:** N/A

**Assessment Criteria & Alignment**

|  |  |  |  |
| --- | --- | --- | --- |
| CSLOs | PSLOs | ILOs | Direct and Indirect Assessment Methods |
| CSLO 1 | PSLO\_1 |  | PSLO directed Homework, Quizzes, Tests, & Final Exam\* |
| CSLO 2 | PSLO\_1 |  | PSLO directed Homework, Quizzes, Tests, & Final Exam\* |
| CSLO 3 | PSLO\_1 |  | PSLO directed Homework, Quizzes, Tests, & Final Exam\* |
| CSLO 4 | PSLO\_1 |  | PSLO directed Homework, Quizzes, Tests, & Final Exam\* |

\* See additional information at end of syllabus.

**Course Student Learning Outcomes (CSLO):**

Upon successful completion of this course the student will:

CSLO #1: Evaluate finite and infinite limits using a graph, algebraic techniques, and apply to determining continuity at a point or the limit definition of derivative.

CSLO #2: Find derivatives for a variety of functions using differentiation rules including product, quotient, chain rule, and implicit differentiation.

CSLO #3: Solve application problems including graphing functions, related rates, and optimization.

CSLO #4: Find antiderivatives, integrate using the Fundamental Theorem, and apply the technique of substitution.

**Program Student Learning Outcomes (PSLO):**

PSLO 1: Mathematical Concepts of Calculus
Differentiate and integrate single and multi-variable functions and apply fundamental calculus concepts in problem solving using appropriate techniques.

**Institutional Learning Outcomes (ILO):**

**Calculation of Final Grades**:

|  |  |
| --- | --- |
| Participation Assignments | 15% |
| Tests  | 60%  |
| Cumulative Final Exam | 25%  |

**GRADING SCALE:**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | F |
| GPA Points | 4.0 | 3.7 | 3.3 | 3.0 | 2.7 | 2.3 | 2.0 | 1.7 | 1.3 | 1.0 | 0.0 |
| % | 100-93 | 92.9-90 | 89.9-88 | 87.9-82 | 81.9-80 | 79.9-78 | 77.9-72 | 71.9-70 | 69.9-67 | 66.9-60.1 | 60 and under |

**SCHEDULE OF LEARNING topics covered**

|  |
| --- |
| **Schedule of Assignments***\*\*Assignment Selection and schedule may be subject to change\*\** |
| Week 01 | Prerequisite Review  |
| Week 02 | **Ch. 1. LIMITS AND THEIR PROPERTIES**. A Preview of Calculus.Finding Limits Graphically and Numerically. Evaluating Limits Analytically. Continuity and One-Sided Limits. Infinite Limits.**Test 1** |
| Week 03 |
| Week 04 |
| Week 05 | **Ch 2. DIFFERENTIATION.** The Derivative and the Tangent Line Problem. Basic Differentiation Rules and Rates of Change. Product and Quotient Rules and Higher-Order Derivatives. The Chain Rule. Implicit Differentiation. **Test 2** |
| Week 06 |
| Week 07 |
| Week 08 | **Ch. 3. APPLICATIONS OF DIFFERENTIATION.** Extrema on an Interval. Rolle's Theorem and the Mean Value Theorem. Increasing and Decreasing Functions and the First Derivative Test. Concavity and the Second Derivative Test. Limits at Infinity. A Summary of Curve Sketching. Optimization Problems. **Test 3**  |
| Week 09 |
| Week 10 |
| Week 11 | **CH 4. INTEGRATION.** Antiderivatives and Indefinite Integration. Area. Riemann Sums and Definite Integrals. The Fundamental Theorem of Calculus. Integration by Substitution. **Test 4** |
| Week 12 |
| Week 13 |
| Week 14 | Course Review |
| Week 15 | Final Exam Week Comprehensive Final Exam |

**Attendance Policy:**

Lincoln University uses the class method of teaching, which assumes that each student has something to contribute and something to gain by attending class. It further assumes that there is much more instruction absorbed in the classroom than can be tested on examinations. Therefore, students are expected to attend all regularly scheduled class meetings and should exhibit good faith in this regard.

• Absences will be counted starting **from the first day classes begin**.

• ***Three*** late arrivals (after 10 minutes) will be counted as one absence.

• After ***Three*** or more unexcused absences, grades may be lowered.

• The student is responsible for all work missed during those absences

• In case of illness, death in the family, other extenuating circumstances, athletic events or other University sanctioned activities the student must present documented evidence of inability to attend classes for an excused absence

<http://www.lincoln.edu/registrar/2016catalog.pdf>

**Students with Disabilities Statement:**

Lincoln University is committed to non-discrimination of students with disabilities and therefore ensures that they have equal access to higher education, programs, activities, and services in order to achieve full participation and integration into the University.  In keeping with the philosophies of the mission and vision of the University, the Office of Student Support Services, through the Services for Students with Disabilities (SSD) Program, provides an array of support services and reasonable accommodations for students with special needs and/or disabilities as defined by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990.  The Services for Students with Disabilities Program seeks to promote awareness and a campus environment in which accommodating students with special needs and/or disabilities is natural extension of the University’s goal. Any students with disabilities should contact the Office of Student Support Services.

[http://www.lincoln.edu/student services/index.html](http://www.lincoln.edu/student%20services/index.html).

**The Student Conduct Code:**

Students will be held to the rules and regulations of the Student Conduct Code as described in the Lincoln University Student Handbook. Behavior that disrupts academic pursuits, or infringes upon the privacy, rights, or privileges of other persons is prohibited. It is expected of all students to show respect, fairness and consideration to all present. Excessive talking, arriving late or leaving early, leaving and reentering class, use of phones or pagers, or other means of disrupting the class will not be tolerated and students may be asked to leave. Students who constantly disrupt class may be asked to leave permanently and will receive an “F”.

<http://www.lincoln.edu/studentaffairs/The%20Lincoln%20University%20Student%20Handbook%202016-2017.pdf>

**University Academic Integrity Statement:**

Students are responsible for proper conduct and integrity in all of their scholastic work. They must follow a professor's instructions when completing tests, homework, and laboratory reports, and they must ask for clarification if the instructions are not clear. In general, students should not give or receive aid when taking exams, or exceed the time limitations specified by the professor. In seeking the truth, in learning to think critically, and in preparing for a life of constructive service, honesty is imperative. Honesty in the classroom and in the preparation of papers is, therefore, expected of all students. Each student has the responsibility to submit work that is uniquely his or her own. All of this work must be done in accordance with established principles of academic integrity.

Academic Dishonesty includes, but is not limited to offering, using and/or receiving unauthorized assistance, information, or materials during a test or exam.

Sanctions for violations of the academic integrity standards include:

* Warning: Attempted or implied act of misconduct.
* Failure of a Test: Observed incident of misconduct during an exam or on the test paper.
* Failure of Course and an official report of academic dishonesty: Blatant and/or pervasive cheating on an exam or repeated incidents in the class.

<http://www.lincoln.edu/registrar/2016catalog.pdf>

**Policy on Electronic Devices in the Classroom:**

Electronic devices (cell phones, tablets, laptops, etc.) may not be used in class except for educational purposes (e.g. note taking, recording assignments, etc). Students who violate this policy will receive a verbal warning for the first infraction and additional violations may result in the student being asked to leave class. Use of these devices during exams will be considered as academic dishonesty and will be subject to the sanctions described in the previous section.

**Assessment Methods (Tools) Direct & Indirect:**

Homework problems will be assigned daily on material covered in class. Students are encouraged to work cooperatively in studying the course material. The objective of group work is to develop individual skills while learning to work effectively as a team, to think and talk about problem solving and the underlying mathematical concepts, and to develop the ability to ask and answer questions as they arise. However, each student is responsible for all the assigned material, in other words, students can work together, but should not simply copy work from each other. Students are also encouraged to make regular visits during office hours, to meet in study groups, and to use the Learning Resource Center Math Lab or the SI or Math tutors from the School of Natural Sciences.

Quizzes, Tests and Final Exam

Short quizzes or take home assignments will be given on an unannounced basis. One hour in- class exams will be announced at least a week in advance. A cumulative two hour Final Exam will be given as scheduled by the Registrar. All work must be shown for full credit.

Make-Up Exams
Make-up exams will only be allowed with *official documentation* of an unavoidable absence, and the student must have notified the instructor either beforehand or within 24 hours of the exam and scheduled the make-up promptly upon return to campus.

Note: Any student requesting special testing conditions due to disability must provide documentation at the beginning of the semester and make any needed arrangements before the exam.

Participation Assignments\*: As designated by the individual instructor, these may include homework, quizzes, attendance, or other announced assignments.

Resources

Students are also encouraged to make regular visits during office hours, to meet in study groups, and to use the Learning Resource Center Math Lab and the SI or Math tutors from the School of Science & Technology.