TRINITY MEDICAL SCIENCES UNIVERSITY | SCHOOL OF BIOMEDICAL SCIENCES

MATH II (CALCULUS)

MATH 202

Course Description

Calculus deals with concepts of differentiation and integration and their applications. Students will learn to differentiate first principles and from the use of the Product, Quotient, and Chain Rules. They will also nudge up against the applications of maxima and minima. In integration, they will apply the definite integral, calculate areas and volume, do mathematical modeling, and solve differential equations.

Credit: 3 credits **Repeatable: No**

Course Structure

The course will be presented in different formats: Lectures, self-directed learning, discussions and student assignments etc.

Competencies

This course emphasizes competencies to enhance skills essential for a future health care professional.

- Knowledge
  - **Demonstrate content knowledge and skills in foundational courses required by biomedical professionals**
  - Demonstrate information literacy
  - **Demonstrate quantitative reasoning**
  - **Demonstrate longitudinal learning through coursework**
- Critical Thinking
  - **Develop the skills of self-reflection and peer assessment to improve personal performance.**
  - Demonstrate the ability to analyze literature and written material
  - Demonstrate the ability to distinguish between well-reasoned and poorly reasoned arguments
- Communication Skills
  - Demonstrate effective presentation skills to faculty and peers
  - **Demonstrate effective listening skills**
  - Demonstrate effective written communication

Objectives:

Upon completion of the MATH 202 course, the student should be able to:

- Determine the limiting value of a function.
- Investigate a function for continuity
- Compute and interpret the derivative of univariate and multivariate functions and apply same to problems in the Biomedical Sciences
- Apply differentiation techniques in solving problems related to series
- Apply Integration to compute areas under curves and solutions to Ordinary Differential Equations of the first order.
- Solve differential equations of the second order
- Use differential equations to model occurrences in the field of epidemiology

Schedule: Dates and times to be posted at the beginning of the term on the online calendar.

Course Topics / Outline

Activity #	Lecture Topics
Week1	Limits: meaning of; limit theorems, Right and Left hand limits; Continuity; Right and Left hand continuity
Week 2	Differentiation from first principles, Rules of differentiation
Week 3	Stationary values, turning points, points of inflection
Week 4	Derivatives of trigonometric, exponential and logarithmic functions
Week 5	Higher-Order derivatives and implicit differentiation, Monotonicity and Concavity, Rules for Anti-derivatives
Week 6	Integration by substitution, Integration of quotients, Integration by parts
Week 7	**Mid-Term Examination**
Week 8	Solving equations numerically (Fixed-point algorithm, Newton's Method)
Week 9	Properties of limits of sequences, Power series
Week 10	Maclaurin series, Taylor series
Week 11	Binomial Series
Week 12	Functions of two or more variables, Partial derivatives
Week 13	Maxima, minima and saddle points of multivariate functions
Week 14	**End of Term Examination**

Assignments:

Students present written solutions to questions on each topic assigned.

Textbooks and Reference Materials:

Dale Varberg, Edwin J. Purcell, Steven E. Rigdon. Calculus with Differential Equations. 9th Edition. Publisher: Pearson.

Evaluation: Students are evaluated by a midterm exam, a final exam, assignments and their attendance.

Points:

	Points*
Assignments	20%
Mid Term	30%
Final exam	40%
Attendance	10%
Total points	100%

*Points are approximate and may be adjusted during the term. Students will be notified of changes.

Grade:

Percent of Points	Letter Grade
95-100%	A(h)
90-94%	A
85-89%	B+
80-84%	B
75-79%	C+
70-74%	C
<70%	F

Attendance:

Students are expected to attend at least 80% of all scheduled learning activities. Attendance in the class will be recorded. Students attended 80% or more will be awarded with 10% on total scoring system. Please note that absences due to illness or misadventure will be factored into the 20% of allowable absences if informed respective faculty or the Dean of Students.

Policies:

Professional Demeanor

The student should be thoughtful and professional when interacting with faculty and other students. Inappropriate behavior includes the use of offensive language, gestures, or remarks with sexual overtones. Students should maintain a neat and clean appearance, and dress in attire that is generally accepted as professional.

Honesty

Students are expected to demonstrate honesty and integrity in all aspects of their education and in their interactions with faculty, administration, physicians, patients, and fellow students. They will not cheat, plagiarize, or assist others in the commission of these acts.

Faculty and Office Hours:

Mr. Marcus Caine, Instructor

Student may schedule an appointment by email.

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