



THE CO-OPERATIVE UNIVERSITY OF KENYA

SCHOOL OF COMPUTING AND MATHEMATICS

DEPARTMENT OF MATHEMATICAL SCIENCES

UNIT: BMAT 1205 CALCULUS I (42 HOURS)

Pre-requisite: BMAT 1101 BASIC MATHEMATICS

Course Purpose

The course aims at introducing Students to both differential and integral calculus including finding integral and limits of functions as a foundation of other mathematical courses/units.

Expected Learning Outcomes

Upon completion of this course, the student will be able to:

1. Compute the integral of functions and limits of elementary functions at a point.
2. Demonstrate derivatives of functions given either implicitly or explicitly in integral calculus.
3. Apply the theory of derivatives to the graphing of curves and to solving related rate, optimization, differential problems and estimation of zeros of a function with Newton's method.

Course Content

Calculus concepts: integral, Limits, continuity and differentiability. Differentiation by first principles and by rule for x^n integral and fractional n, sums, products, quotients, chain rule, trigonometric, logarithmic and exponential functions of a single variables. Finding of the exposure to the epsilon-delta process and continuity. Parametric differentiation. Application: equations of tangent and normal, kinematics, rates of change and stationary points. Integration: anti-derivatives and their applications to areas and volumes.

Instructional Methods

Lectures, discovery learning, problem based learning, experiential learning, group based learning, independent studies and eLearning.

Instruction Materials

Textbooks, Whiteboard , computers ,Lcd's and handouts / notes.

Course Assessment

CATs and Assignments 30%

Final examination 70%

Total 100%

Course Textbooks

1. Maron (2000), Problems in Calculus of One Variable, CBS; 1ST edition, ISBN = 8123902522
2. Apostol, T., M. (2007). Calculus. Volume I. 2nd Ed. Wiley. ISBN-13: 978-0471000051
3. Alex. (2003). Calculus Ideas and Applications. John Wiley and Sons. ISBN-10: 0471401439; ISBN-13: 978-0471401438
4. Thomas, G., B. and Funney, R., L. (2006). Calculus and Analytical geometry (6th Edition II). Wesley, isbn=8177583255
5. Spiegel, M., R., C. (1974). Theory and problems in Calculus. McGraw Hill
6. Amit M Agarwal (2008), Skills in Mathematics Integral Calculus, Arihant Prakashan, ISBN=8188222216.