Calculus II **3 Credit Hours**

Objective

The objective of this course is to prepare the students for coordinating problems by various viewpoints and to encourage and motivate the students to think abstractly, and explore possibilities in field of computer science, in particular, computer graphics. Class assignment will be given at the end of each lecture, and Software MATLAB/MATHEMATICA/MAPLE will be used to demonstrate the visualization of surfaces. The following topics will be covered in this course: Motivation and applications of the course, Rectangular coordinates in 3-space, spheres, cylindrical surfaces, Vectors, Scalar (dot) products, projections, Vector (cross) products. Parametric Equations of Lines, Planes in 3-space, Quadric surfaces, Spherical and cylindrical coordinates, Introduction to vector-valued functions, Calculus of vector-valued functions, Change of parameter, Arc length, Unit tangent, normal, and binormal vectors, Curvature, Functions of two or more variables, Partial derivatives, The Chain rule, Directional derivatives and Gradients, Tangent planes and normal vectors, Maxima and minima of functions of two variables, Lagrange multipliers, Double integral , Parametric surfaces; Surface area, Triple integral, Line integrals, Green's Theorem, Surface integrals; application of surface integrals, Divergence Theorem, Stoke's Theorem.

Prerequisites

MA 101 – Calculus I

Text Book

Anton, Bivens and Davis, *Calculus*, 7th Edition, John Wiley and sons, 2002.ISBN: 9971-51-431-1

Reference Books

- Thomas and Finney, *Calculus with Analytic Geometry*, Addison Wesley, 9th Ed, 1999. ISBN: 0201163209