

Form (H)
Short course description

Course title: Vector Calculus	Course number and code: MATH 202
Co-requisite: MATH 201	Language of the course: English
Course level: Fourth Level	Effective hours: 4 (3+2+0)

Course description

Vectors in two and three dimension, scalar and vector products. Equations of lines and planes in 3- dimensional space. Surfaces of revolution an their equations in cylindrical and spherical coordinates. Vector valued functions of a real variable, curves in space, curvature. Rats of change in tangent and normal directions, directional derivatives. Gradient of a function, equations of normal and tangent space to a surface at a point. Vector fields, divergence curl of a vector, line and surface integrals. Green's theorem , Gauss's divergence theorem, Stokes' theorem.

Course objectives

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| 1- Equations of lines and planes in 3- dimensional space. |
| 2-Manipulating vector-valued functions and their concrete applications. |
| 3- line, surface and volume integrals by using Green's theorem , Gauss's divergence theorem, Stokes' s theorem. |

Learning outcomes (understanding, knowledge, and intellectual and scientific skills)

After studying this course, the student is expected to be able to:

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| 1- Manipulating Vectors in two and three dimension, scalar and vector products, equations of lines and planes in 3- dimensional space. |
| 2- Background about Surfaces of revolution and their equations in cylindrical and spherical coordinates.
Vector valued functions of a real variable, curves in space, curvature. Rats of change in tangent and normal directions, directional derivatives. |
| 3- Manipulating Gradient of a function, equations of normal and tangent space to a surface at a point. |
| 4- Calculating Line and surface integrals, Vector fields, divergence curl of a vector, line and surface integrals. Green's theorem, Gauss's divergence theorem, Stokes's theorem. |

Textbook adopted and supporting references

Title of the book	Author's name	Publisher's name	Date of publication
1- Calculus with analytic geometry.	E .Swokowski	PSW Publishing Company	1991
2- Analytic geometry and Vector Calculus.	Ibrahim Sermini	Al-Roushd Library	2008
3- Vector Calculus	J.E. Mardsen and A.J.Tromba	W.H. Freeman and company	1976
4-Theory and Problems of Vector Analysis	M.R.Spiegel	Schaums' outline series	1959