



East West University
Dept. of Mathematical and Physical Sciences (MPS)
Semester: Spring 2024

Course Outline of MAT 104

Course Code : MAT 104
Pre-requisite : MAT 101
Credit Hours : 3
Course Title : Co-ordinate Geometry and Vector Analysis
Course Instructor : Tausif Ahmed (TAUSIF)
Lecturer, Department of MPS
E-mail : tausif.ahmed@ewubd.edu
Office : FUB-904
Telephone : TBD
Class Time :

Section	Day	Time	Room
6	MW	08:00AM-09:15AM	FUB-202
7	SR	09:25AM-10:40AM	FUB-602(S) FUB-802(R)

Office Hours :

Sunday	Monday	Tuesday	Wednesday	Thursday
11:00AM-01:00PM	10:00AM-12:00PM	10:00AM-11:00AM	10:00AM-12:00PM	11:00AM-01:00PM

Goal of the Course: This course is designed to develop the basic concept of students in the area of coordinate geometry and vector analysis. A student has to study this course because the contents of the course are very much applicable in all branches of Science and Engineering. Also, the methods of vector analysis provide a natural aid to the understanding of geometry and some physical concepts. They are also a fundamental tool in many theories of Applied Mathematics. Our goal is to obtain basic knowledge about two-dimensional geometry, three-dimensional geometry and vector analysis.

Course learning outcome:

At the end of this semester, students will be able to

(a) identify the coordinates of a point (b) transform the coordinates of a point or the equation of a curve (c) identify the curves (d) calculate scalar and vector products (e) find the vector equations of lines and planes (f) differentiate vector functions of a single variable (g) calculate velocity and acceleration vectors for moving particles (h) find the gradient of a function. (i) find the divergence and curl of a vector field (j) use the gradient operator to calculate the directional derivative of a function (k) calculate the unit normal at a point on a surface (l) recognize irrotational and solenoidal vector fields (m) evaluate line and surface integrals (n) understand the various integral theorems relating line, surface and volume integrals.

Course Contents:

Two-Dimensional Geometry: Change of axes, transformation of co-ordinates, Pair of straight lines, Circles: Tangents and Normals, Chord of Contact, System of Circles: Orthogonal Circles. Conic Section: Parabola, Ellipse & Hyperbola. The general equation of second degree, Identification of Conics.

Three-Dimensional Geometry: Co-ordinate systems; Direction cosines & direction ratios, Plane, Straight line: The Shortest distance, Sphere: Tangent Plane. Cylinder and Cone.

Vector Analysis: Vectors and Scalars, Algebra of vectors, Vector differentiation and vector integration, Gradient, Divergence and Curl: Cartesian, Spherical, Polar and cylindrical systems, Physical significance of Gradient, Divergence and Curl. Green's theorem, Divergence theorem, Stoke's theorem and their applications.

Text Book

- a) A Text Book on Co-ordinate Geometry and Vector Analysis: Khosh Mohammad.
- b) Vector Analysis (Schaum's series), Murray R. Spiegel, Schaum Outline Series.

Reference Book

Coordinate Geometry, Luther Pfahler Eisenhart, Dover Publications Inc.

Term Examination Schedule:**Schedule of Final Exam of Spring 2024 for Undergraduate Programs
(Except Pharmacy)**

Class Days	Last Day of Classes	Final Exam Day	Final Exam Date
ST	28 May 2024	Sunday	02 June 2024
TR	28 May 2024	Tuesday	04 June 2024
MW	29 May 2024	Wednesday	05 June 2024
SR	26 May 2024	Thursday	06 June 2024

Score Distribution:

Assessment Tools	Marks
1. Class Test/ Quiz	20
2. Class Attendance/Performance	10
3. Assignment/Presentation/Viva	10
4. Mid Exam	30
5. Final Exam	30

Total: 100**Grading Policy:**

Marks (%)	Letter Grade	Grade Point
80-100	A+	4.00
75-79	A	3.75
70-74	A-	3.50
65-69	B+	3.25
60-64	B	3.00
55-59	B-	2.75
50-54	C+	2.50
45-49	C	2.25
40-44	D	2.00
0-39	F	0

Special Instructions:

- There will be no make-up quizzes
- Make-up exam for the Midterm may be taken in case of valid reason. Student has to apply for make-up exam with proper document.
- Regular class attendance will be taken. The students are advised to attend classes regularly and keep regular contact with instructor for academic problems.
- There is zero tolerance for cheating at EWU. Students caught with cheat sheet in their possession, whether used or not used, &/ or copying from cheat sheets, writings on the palm of hand, back of calculator, chairs or nearby walls, etc. would be treated as cheating in the exam hall. The only penalty for cheating is expulsion.

Date: 24/01/2024

(Tausif Ahmed)
Lecturer