

Basic and Applied Science Courses (BA)

Basic and Applied Science Courses Group

BA 224 – Mathematics (4)COURSE INFORMATION

Course Title:	Mathematics (4)		
Code:	BA 224		
Hours:	Lecture – 2 Hrs.	Tutorial – 2 Hrs.	Credit –3.
Prerequisite:	BA 223 – Mathematics (3)		

GRADING

Class Performance/Attendance:	10%
Midterm # 1/Assignments – (7th Week):	30%
Midterm # 2/Assignments – (12th Week):	20%
Final Exam:	40%

COURSE DESCRIPTION

This course gives a comprehensive study on the 2D and 3D vectors : algebra, differential and integral calculus , and the physical interpretation of the integral theorems. The course also gives a study on the complex functions, its differentiation and integration, the residue theorems and its application to real integrals.

TEXT BOOKS

Erwin Kreyszig, ‘Advanced Engineering Mathematics’ , John Wiley, 9th edition , 2006 .

REFERENCE BOOKS

D.G.Zill and M.R.Cullen , ‘Advanced Engineering Mathematics ‘ , PWS Publishing Company.

COURSE AIM

This course aims at enhancing the students knowledge in the subject of “Vector Differential and Integral calculus” as well as Complex Analysis and Integration needed to solve engineering problems at higher level of the under graduate engineering studies.

APPENDIX A-11

SPECIFIC OUTCOMES OF INSTRUCTION

Through this course the student should know:

- Vector Differential Calculus
- Vector Integral calculus
- Complex Analytic Functions and Complex Integration.

COURSE OUTLINE

Week Number 1: Vector Algebra / Dot and cross product and Applications

Week Number 2: Partial Differentiation / and Derivatives of vector functions

Week Number 3: Gradient / Divergence/ curl/ Laplacian

Week Number 4: Line Integrals / line Integrals Independent of the path / Exactness

Week Number 5: Conservative vector fields

Week Number 6: Double Integrals in Cartesian and polar coordinates / Green's Theorem

Week Number 7: Surface Integrals / Stokes' Theorem /7th week Exam

Week Number 8: Triple Integrals / Divergence (Gauss' Theorem)

Week Number 9: Review on Integrals Theorems

Week Number 10: Complex numbers and functions / forms of representation

Week Number 11: Analytic functions/ Harmonic functions

Week Number 12: Line complex integrals / Cauchy's Integrals Theorem /12th week Exam

Week Number 13: Zeros and poles of Analytic functions/ Residues and their evaluation

Week Number 14: Residue Theorem / Application to Real Integral

Week Number 15: Introduction to Fourier Integrals and Transforms

Week Number 16: Final Exam.

APPENDIX A-12

COURSE COORDINATOR AND DEMAND

Course Coordinator: Dr.Alfysal Abdelhameed.

Course Demand: *Required*