

BA224 Mathematics IV

COURSE INFORMATION

Prerequisites	Academic Year & Level		Teaching Methods			Credit Hrs.
	Year	Semester	Lecture	Tutorial	Lab.	
BA223	2	4	2	2		3

COURSE AIM

This course introduces the advanced engineering mathematical concepts and methods of the vector analysis and of the complex analysis, including their physical applications.

COURSE WEEKLY CONTENTS

- 1 Vector Algebra / Dot and cross product and its Applications.
- 2 Partial Differentiation / and Derivatives of vector functions
- 3 Gradient / Divergence / Curl / Laplacian operator
- 4 Line Integrals of a scalar and a vector function
- 5 line Integrals Independent of the path / conservative vector fields / Double Integrals in Cartesian
- 6 Double Integrals in polar coordinates / Green’s Theorem
- 7 Midterm Exam
- 8 Triple Integrals
- 9 Spherical coordinates / Cylinder coordinates
- 10 Surface Integrals / Divergence (Gauss’ Theorem)
- 11 Stokes’ Theorem
- 12 12th Assessment
- 13 Complex numbers and functions / forms of representation - Analytic functions/ Harmonic functions
- 14 Zeros and poles of Analytic functions/ Residues and their evaluation Residue Theorem / Application to Real Integral
- 15 Line complex integrals / Cauchy’s Integrals Theorem

STUDENT GRADING & ASSESSMENT

Weeks	Exams	Assign.	Quizzes	Reports	Present.	Lab.	Total
1 to 7	20 Midterm	←	1 0	M A R K S		→	30
To be freely distributed among possible assessments							
8 to 12	←		2 0	M A R K S		→	20
13 to 15	←		1 0	M A R K S		→	10
16 or 17	40 Final						40
Total	Exams	Assign.	Quizzes	Reports	Present.	Lab.	100

REFERENCES

Textbook Roland Minton, Robert T Smith, "Calculus: Early Transcendental Functions", McGraw-Hill Education, 2011.

Other