

Mathematics II

Basic Course Specification							
Course Title	Course Code		Program on which the course is given				
Mathematics II	BA124		Bachelor				
Academic Year	Specialization (hr/week)		Pre-Requisites				
2020 - 2021	Theoretical	2	Mathematics (1) BA123				
	Application	2					
	Credit	3					
Overall Course Objectives							
- Develop the students' skills in the art of integration by studying different methods for solving integration problems, using these methods to deal with some application in engineering, like finding the areas, volumes, the average and the length of a given curve and studying numerical techniques. - Introduce linear algebra concept with applications on how to use it to solve a system of linear equations as well as study the physical meaning of eigenvalues and eigenvectors.							
Course Learning Outcomes. By successful completion of the course each student will be able to:							
Topic			Linking to PLOs	7th Week Assessment	12th Week Assessment	Class Activities	Final Exam
1. Master techniques of integration such as integration by substitution, by parts, trigonometric substitution and integration of rational functions using partial fractions.			c	x	x	x	x
2. Apply the definition of the definite integral and the fundamental theorem of calculus including finding areas, volumes, and length of the curve as well as numerical integration.			c		x	x	x
3. Solve system of linear equations using inverse matrix and Gauss elimination methods.			c, d		x	x	x
4. Find the eigenvalues and eigenvectors for any square matrix as well as study Cayley – Hamilton theorem.			c, d		x	x	x
Course Content							
Lec./ Week #	Topic				Hrs. #	Theoretical	Application
1	Indefinite and standard integrals				4	2	2
2	The fundamental theorem of calculus and integration by substitution				4	2	2
3	Integrals involving powers of trigonometric functions				4	2	2
4	Integration by parts				4	2	2
5	Integration of rational functions using partial fractions				4	2	2
6	Integration using trigonometric substitution				4	2	2
7	7 th Week Exam				4	2	2
8	Integration of quadratic forms and the reduction formulas				4	2	2

Course Content				
Lec./ Week #	Topic	Hrs. #	Theoretical	Application
9	The definite integral and its applications (areas and volumes)	4	2	2
10	Average value of a function, length of the curve and numerical integration (trapezoidal and Simpson’s Rules)	4	2	2
11	Matrix algebra	4	2	2
12	12 th Week Exam	4	2	2
13	Solution of system of linear equations using inverse of a matrix and Gauss elimination methods	4	2	2
14	Physical meaning of eigenvalues and eigenvectors and Cayley – Hamilton theorem	4	2	2
15	Final Exam Review	4	2	2
16	Final Assessment			
Total Hours		60	30	30
Teaching & Learning Methods		Facilities Required for Teaching & Learning Methods		
- Lectures - Tutorials - Assignments & sheets		- White board and data show - Calculator		
Students Assessment Methods				
Assessment Schedule				
Assessment#1		Week 7		
Assessment#2		Week 12		
Assessment#3		Class Activities		
Assessment#4		Week 16		
Grading Method				
7th Week Assessment	Written Exam	30%		
12 th week Assessment	Written Exam	20%		
Class Activities	Assignments –Participation	10%		
Final Exam	Written Exam	40%		
Total		100 %		
Staff Requirements				
Ph.D.				
Course Notes		Essential Books		
None		Calculus, Early Transcendental, Anton, Bivens & Davis-11 th Edition – Wiley, 2018.		
Recommended Books		Periodicals and Publications		
- Calculus, Early Transcendental Functions, Robert T.Smith& Roland B.Minton - Fourth Edition-McGrawHill. - Calculus, Sherman K.Stein & Anthony Barcellos, Fifth Edition-McGrawHill.		None		
IMO References				
None				

Accreditation Bodies

Egyptian Authority for Maritime Safety (EAMS)

European Commission (EC)

*ISO (9001 – 2015) DNV-GL

*Central Evaluation and Accreditation Agency Hanover, Germany (ZEVA)

*Ministry of Education (KSA)

*Ministry of Higher Education (Greece)

*Ministry of Higher Education (Oman)

*Commission for Academic Accreditation (CAA), Ministry of higher Education (UAE)

*University of Plymouth, United Kingdom (dual degree)

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