

## **BA124- Mathematics (2)**

### **CREDIT HOURS**

3 Hours

### **CONTACT HOURS (Hours/week)**

Lecture: 2; Tutorial: 2

### **TEXT BOOK**

- Robert T. Smith and Roland B. Minton, Calculus: Early Transcendental Functions, Mc GRAW. Hill, latest edition.
- Printed Notes.

### **COURSE DESCRIPTION**

This course addresses integration and some of its geometric applications, as well as elementary matrix algebra. It includes definitions and intuitive meanings of indefinite and definite integrals; Fundamental Theorem of Calculus; Basic techniques of integration; Integration by parts; Geometric applications; Integration of powers of trigonometric functions; Substitution; Miscellaneous and Trigonometric substitutions; Integration of rational functions in  $x$  through partial fractions; Numerical Integration. Gauss' method for the solution of linear equations; Matrix inversion and its use in the solution of linear equations.

### **PREREQUISITE:**

BA123

### **RELATION OF COURSE TO PROGRAM**

Required

### **COURSE INSTRUCTION OUTCOMES**

The student will be able to develop skills in the techniques of integration, grasp its intuitive meaning and essential knowledge and skills in matrix algebra.

### **TOPICS COVERED**

- Definition of indefinite integrals and table of famous integrals.
- Simple rules of integration and the fundamental theorem of calculus.
- Fundamental theorem of calculus and integration by parts.
- Integration by parts and integration of rational functions.
- Integration of rational functions.
- Integration of trigonometric powers.
- Trigonometric substitution and 7<sup>th</sup> week exam.
- Integration of quadratic forms and the reduction formulas.
- Definite integration.

- Area and volume.
- Area, volume and length of curve.
- Average of a function, numerical integration and 12<sup>th</sup> week exam.
- Matrix Algebra.
- Solution of systems of linear equations.

**CONTRIBUTION OF COURSE TO MEET THE REQUIREMENTS OF CRITERION 5:**

<b>Professional component Content</b>			
<b>Math and Basic Sciences</b>	<b>Engineering Topics</b>	<b>General Education</b>	<b>Other</b>
✓			

**RELATIONSHIP OF COURSE TO STUDENT OUTCOMES:**

<b>Student Outcomes</b>		<b>Course aspects</b>
A	An ability to apply knowledge of mathematics, science, and engineering	a <sub>1</sub> a <sub>2</sub>
B	An ability to design and conduct experiments, analyze and interpret data.	
C	An ability to design a system, component, or process to meet desired needs within realistic constraints such as economics, environmental, social, political, ethical, health, and safety, manufacturability, and sustainability	
D	An ability to function on multi-disciplinary teams.	
E	An ability to identify, formulate, and solve engineering problems	e <sub>1</sub> e <sub>2</sub> e <sub>3</sub>
F	An understanding of professional and ethical responsibility	
G	An ability to communicate effectively	
H	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social content	
I	A recognition of the need for, and an ability to engage in life-long learning.	
J	A knowledge of contemporary issues within and outside the electrical engineering profession.	
K	An ability to use the techniques, skills, and modern engineering tools necessary for electrical engineering practice.	