Arab Academy for Science, Technology & Maritime Transport
College of Computing & Information Technology

University/Academy:	Arab Academy for Science, Technology and Maritime Transport		
Faculty/Institute:	College of Computing and Information Technology	**Course title**	**Calculus 2**
Program:	B. Sc. of Computer Science	**Course code**	**BA 102**

Form No. (11A)
Knowledge and skills matrix for a course

Week	Course content	Knowledge	Intellectual skills	Professional skills	General skills
1	Definition of indefinite integrals & Table of famous integrals.	• Define the indefinite integration as an infinite sum. • List of famous integrals.	• Apply the table of famous integrals to solve direct integral problems.	• Test the convergence of infinite series. • Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •
2	Simple rules of integration & The fundamental theorem of calculus.	• Identify basic rules for integration.	• Employ basic rules for integration to solve integral problems.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •
3	Integration by parts.	• Explain the formula of integration by parts. • Recognize the method of integration by parts.	• Distinguish problems which are solvable by integration by parts.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •

Week	Course content	Knowledge	Intellectual skills	Professional skills	General skills
4	Integration by parts & integration of rational functions.	• Describe the partial fractions for a given rational function.	• Differentiate the partial fractions for a given rational function.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •
5	Integration of rational functions.	• Express an integral containing a rational function into integrals of the partial factions of this rational function.	• Use the partial fraction method to solve integral problems.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •
6	Integration of Trigonometric powers.	• Discuss integrals containing trigonometric powers.	• Analyze and distinguish the suitable case of trigonometric power to solve integral problems.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •
7	Trigonometric substitution.	• Underline the method of trigonometric substitution.	• Apply the method of trigonometric substitution to solve integral problems.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •
8	Integration of quadratic forms and the Reduction formulas.	• Discuss reduction formulae for an integrals containing a trig function to any power.	• Interpret reduction formulae for an integrals containing a trig function to any power.	• Use integration and partial fractions in many applications in applied sciences.	• Enhance the use numeracy, calculation and statistical methods. •

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9	Definite integration. Areas and Volumes.	• Define definite integration and its geometrical meaning. • Locate a technique to apply integral methods to find areas and volumes.	• Employ integrals methods to calculate areas and volumes.	• Use integration and partial fractions in many applications in applied sciences. • Apply tools and techniques for the design and development of applications. •	• Develop Creativity, imagination skills, and analytic ability.
10	Length of the curve. Average of a function & numerical integration.	• Explain methods to find the average and length for a given function. • Discuss a numerical method to solve definite integrations.	• Compare analytical and numerical solutions of a given integral problem.	• Use calculus to compute, graph, model, and solve problems. •	• Develop Creativity, imagination skills, and analytic ability.
11	Matrix Algebra.	• List the concepts of matrix algebra.	• Practice some problems using matrix operations.	• Ability to use techniques of linear algebra in solving and handling practical problems	• Enhance the use numeracy, calculation and statistical methods. •
12	Solution of system of linear equations.	• Express a system of linear equations into its matrix form. • Recognize a method, using matrix algebra, to solve a system of linear equations.	• Operate matrix algebra to determine the equation of the second-degree polynomial, which passes through given points.	• Ability to use techniques of linear algebra in solving and handling practical problems	• Enhance the use numeracy, calculation and statistical methods. •
13	Eigen values and Eigen vectors.	• Discuss the eigen values and	• Debate the eigen values and eigenvectors for a	• Ability to use techniques of linear algebra in	• Enhance the use numeracy, calculation

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		eigenvectors for a given matrix.	given matrix.	solving and handling practical problems	and statistical methods. •
14	Physical meaning of Eigen values and Eigenvectors & Cayley – Hamilton theorem.	• Underline the meaning of eigen values and eigenvectors. • Explain how to use Cayley – Hamilton theorem to find the inverse of a matrix.	• Apply Cayley – Hamilton theorem to solve a system of linear equations.	• Use calculus to compute, graph, model, and solve problems. •	• Develop Creativity, imagination skills, and analytic ability.
15	General Revision.	•	•	•	•

Course Instructor

Name: **Dr Ahmed Yehia**

Signature:

Head of Department

Name: **Dr. Samah Senbel**

Signature: