1. Basic Information

Program Title	All academic programs
Department offering the Program	
Department Responsible for the Course	Mathematics and Engineering Physics
Course Code	BAS013
Year/ Level	Preparatory Year-Second Semester
Specialization	Faculty requirement
Authorization data of course specification	

Teaching Hours	Lectures	Exercises	Practical
	3	2	0

2. Course aims:

No.	Aim
1	Apply methods of integration and concepts of analytic geometry to formulate and solve simple engineering problems.

3. Learning Outcomes (LOs):

A1.1	Demonstrate the concepts and theories of integration and analytic geometry, appropriate to the discipline.
A1.2	Discuss methodologies of integration to solve simple engineering problems.
A8.1	Communicate effectively in writing
A9.1	Select appropriate methods of integration for modeling and analyzing problems.
A9.2	Apply concepts of solid geometry to solve engineering problems.

4. Course Contents:

No.	Topics	week
1	Techniques of integration	1-3
2	Integration by reduction	4
3	Definite integral ad its properties	5-6
4	Improper integral	7
5	Applications of integration (area, volume, and arc length)	9-10
6	First order ordinary differential equations	11-12
7	Infinite series	13-14
8	Quadratic equation of two variables	1-2
9	Conic sections	3-7
10	Parametric equation of conic sections	8-9
11	Coordinate systems in space	10
12	line and plane in space	11-12
13	Quadratic surfaces (cylinder, sphere, ellipsoid, hyperboloid, cone and paraboloid).	13-14

5. Teaching and Learning Methods:

No.	Teaching Method
1	Interactive lectures (hybrid learning)
2	Discussion Sessions
3	Flipped classroom

6. Teaching and Learning Methods for Disable Students:

No.	Teaching Method
1	Additional Tutorials
2	Online lectures and assignments

7. Student Assessment:
7.1 Student Assessment Methods:

No.	Assessment Method	LOs
1	Mid Term Examination	A1.1,A9.1
2	Semester work (Quizzes, presentation, Portfolio)	A8.1, A9.2
3	Final Term Examination	A1.1,A1.2, A9.1, A9.2

7.2 Assessment Schedule:

No.	Assessment Method	Weeks
1	Mid Term Examination	8
2	Semester work (Quizzes, presentation, Portfolio)	weekly
3	Final Term Examination	15

7.3 Weighting of Assessments:

No.	Assessment Method	Weights
1	Mid Term Examination	17%
2	Semester work (Quizzes, presentation, Portfolio)	10%
3	Final Term Examination	73%
Total		100%

8. List of References

No.	Reference List
1	Jumarie, G., Fractional Differential Calculus for Non-Differentiable Functions: Mechanics, Geometry, Stochastics, information Theory. 2013: LAP Lambert Academic Publishing.
2	Hestenes, D. and G. Sobczyk, Clifford algebra to geometric calculus: o unified language for mathematics and physics. Vol.5. 2012: Springer Science & Business Media
3	Grossman, S.I Multivariable calculus, linear algebra, and differential equations. 2014. Academic press

9. Facilities Required for Teaching and Learning:

No.	Facility
1	Lecture Classroom
2	White Board
3	Data Show System
4	Visualizer
5	Presenter
6	Sound System

10. Matrix of Knowledge and Skills of the Course:

No.	Topic	aim	LO's
1	Techniques of integration	1	A1.1
2	Integration by reduction	1	A1.1, A8.1
3	Definite integral ad its properties	1	A1.1, A1.2, A8.1
4	Improper integral	1	A1.1
5	Applications of integration (area, volume, and arc length)	1	A1.1, A1.2, A9.1, A9.2
6	First order ordinary differential equations	1	A1.1, A9.1
7	Infinite series	1	A1.1, A8.1
8	Quadratic equation of two variables	1	A1.1, A8.1
9	Conic sections	1	A1.1,A8.1, A9.1,A9.2
10	Parametric equation of conic sections	1	A1.1,A9.1, A9.2
11	Coordinate systems in space	1	A1.1
12	line and plane in space	1	A1.1, A8.1
13	Quadratic surfaces (cylinder, sphere, ellipsoid, hyperboloid, cone and paraboloid).	1	A1.1, A9.1

Course Coordinator: Dr/ Mona Sameeh

Head of Department: Prof. Dr. Mohamed Mohamed El Metwally El Gamal

Date of Approval:

Course: Mathematics 2	
Program LOs	**Course LOs**
A1. Identify, formulate, and solve complex engineering problems by applying engineering fundamentals, basic science and mathematics.	A1.1 Demonstrate the concepts and theories of integration and analytic geometry, appropriate to the discipline. A1.2 Discuss methodologies of integration to solve simple engineering problems.
A8. Communicate effectively–graphically, verbally and in writing–with a range of audiences using contemporary tools.	A8.1 Communicate effectively in writing
A9. Use creative, innovative and flexible thinking and acquire entrepreneurial and leadership skills to anticipate and respond to new situations.	A9.1 Select appropriate methods of integration for modeling and analyzing problems. A9.2 Apply concepts of solid geometry to solve engineering problems.