KINGDOOM OF SAUDI ARABIA
Ministry of Education
Al-Imam Mohammad Ibn Saud Islamic University
College of Sciences
Department of Mathematics & Statistics

المملكة العربية السعودية
وزارة التعليم
جامعة الإمام محمد بن سعود الإسلامية
كلية العلوم
قسم الرياضيات والإحصاء

SYLLABUS

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Teaching Language
MAT	**114**	**Calculus (2)**	**4**	**3**	**0**	**2**	**6**	**MAT 113**	**2[1]**	**English**

A. Course Description

Enhance and reinforce the knowledge of Applied Calculus (1), with other topics which are essential to proceed to next courses in all programs. This course describes the most important ideas, theoretical results, and examples of integration techniques, infinite series, Functions of Several Variables, Multiple Integrals, and Parametric Equations. The course includes the essential fundamentals of these topics. The emphasis is on calculations, and some applications are mentioned.

B. Course Outcomes

At the end of this course the student will be able to:

- Use different techniques of integration.
- Apply definite integrals to physics and Engineering.
- Develop the basics of the calculus of infinite series, and their applications.
- Set up and compute multiple integrals.
- Work with parametric representation in plane and space.

C. References:

Required Textbook

Calculus: Early Transcendental Functions, R. T. Smith, R. B. Minton, McGraw-Hill, 4th Edition, 2012.

Other references:

- *Calculus*; O. Swokowski, et al, PWS Pub. Co., 6th Edition, 1994.

- *Calculus: Early Transcendentals,* C. Henry Edwards, David E. Penney, 7th Edition, Pearson Prentice Hall, 2008.

- *Schaum's Outline of Calculus,* Frank Ayres, Elliott Mendelson, 6th Edition, McGraw-Hill, 2013.

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[1] *For the B.Sc. in Computer Science.*

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D. Topics Outline

1. **Integration Techniques:** Review the Formulas and Techniques; Area between two Curves; Integration by Parts. Substitution in Definite Integrals. Integrals Involving Logarithmic, Exponential, and Hyperbolic Functions. Trigonometric Techniques of Integration. Integration of Rational Functions using Partial Fractions. Improper Integrals.

2. **Infinite Series:** Infinite Series (Convergence and divergence) Integral Test. p-Series Test. Comparison Test, Limit Comparison test. Alternating series. Absolute Convergence; Ratio Test, Root Test. Power Series.

3. **Functions of Several Variables and Partial Differentiation:** Functions of Several Variables, **Limits an**d Continuity. Partial Derivatives, Tangent Planes. Chain rule. The Gradient and Directional Derivatives.

4. **Multiple Integrals: Double Integrals in Cartesian Coordinates; Doubles Integrals in Polar Coordinates.** Surface Area. Triple Integrals in Cartesian Coordinates.

5. **Parametric equations:** Plane Curves and Parametric Equations, Calculus and Parametric Equations. Arc Length and Surface Area in Parametric Equations. Polar Coordinates.

E. Office Hours

Office hours give students the opportunity to ask in-depth questions and to explore points of confusion or interest that cannot be fully addressed in class.

F. Exams & Grading System

The semi-official dates of the exams for this course are:

- **Midterm 1:** 6th or 7th week.
- **Midterm 2:** 11th or 12th week.
- **Quizzes & Homeworks:** During the semester.
- **Final Exam:** 16th week.

Your course grade will be based on your semester work as follows:

Midterm 1: 20 %	**Midterm 2:** 20 %	**Final Exam:** 40 %
Quizzes, Homework, Attendance & Participation: 20 %		

The grading distribution:

A+	A	B+	B	C+	C	D+	D	F
[95, 100]	[90, 95)	[85, 90)	[80, 85)	[75, 80)	[70, 75)	[65, 70)	[60, 65)	[0, 60)

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G. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. ("Immediate family" is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

Executive Rules for Study Regulations and Exams
goo.gl/ykm7t3