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 التعلـيـم
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	**101**	**Calculus (1)**	**4**	**3**	**0**	**2**	**7**		**1[1]**	**English**

A. Course Description

This course describes the most important ideas, theoretical results, and examples of the limit, continuity, differentiation, and integration for functions with one variable. The course includes the essential fundamentals of these topics. The emphasis is on calculations, and some applications are mentioned.

B. Course Outcomes

Understanding basics of differentiation and integration and their applications which are essential to proceed to next courses in all programs.

C. References

Required Textbook

Calculus, R. T. Smith and R. B. Minton, 4th Edition, McGraw-Hill, 2012.

Other references

- *Essential Calculus with Application;* Richard A. Silverman, Dover Publications, 1989.
- *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, 6th Edition; Frank Ayres, Elliott Mendelson, McGraw-Hill, 2013.

Course Website: Google Classroom Webpage: http://www.imamm.org/

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[1] *B.Sc. in Applied Mathematics and Physics.*

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D. Topics Outline

1. **Limits and Continuity:** The Concept of Limit, Computation of Limits, Continuity and its Consequences, The Intermediate Value Theorem and The Bisections Method, Limits Involving Infinity, Asymptotes, Formal Definition of the Limit, Exploring the Definition of Limit Graphically.

2. **Differentiation:** Tangent Lines and Velocity, The Derivative, Computation of Derivatives, The Power Rule, Higher Order Derivatives, The Product and Quotient Rules, The Chain, Derivatives of Trigonometric Functions and Inverse Trigonometric Functions, Derivatives of Exponential, Logarithmic, and Hyperbolic Functions, Implicit Differentiation, The Mean Value Theorem.

3. **Applications of Differentiation:** Indeterminate Forms and Hopital's Rule, Maximum and Minimum Values, Increasing and Decreasing Functions, Concavity and the Second Derivative Test, Overview of Curve Sketching, Optimization, Related Rates.

4. **Integration:** Sums and Sigma Notation, Partitions and Riemann Sums, Area, The Definite Integral, Area between Curves, The Fundamental Theorem of Calculus, Indefinite Integral, Integration by Substitution, and Integration by Parts.

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 & Homework:** 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 %
4 Quizzes, 4 Homeworks, 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 Workload:

#	Teaching/learning activities	Contact Hours	Frequency	Total Contact hours	Self-study hours	Total self-study hours	Student Learning Time
1	Lecture	3	15	45	1	15	60
2	Tutorial	2	15	30	3	45	75
3	Lab\Practical	0	0	0	0	0	0
4	Homework	0	4	0	1	15	15
5	Quiz	0.25	4	1	1	4	5
6	Test (Midterm)	1.5	2	3	6	12	15
7	Final Exam	2	1	2	12	12	14
Total				81		103	184

Independent self-study = 103/15 $\cong$ 7 hrs per week

H. 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 Examsgoo.gl/ykm7t3