SYLLABUS

Course Code	*Course Num.*	*Course Name*	*Credit Hours*	*Lec.*	*Lab.*	*Tut.*	*Private study*	*Pre-requisites*	*Course Level*	*Teaching Language*
MAT	**102**	**Calculus (2)**	**4**	**3**	**0**	**2**	**7**	**MAT 101**	**2**[1]	**English**

A. Course Description

This course describes the most important ideas, theoretical results, and examples of integration techniques, infinite series, 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:

- Be familiar with different techniques of integration.
- Apply definite integrals to physics and engineering.
- Use convergence tests to analyze the behavior of infinite series.
- Describe curves parametrically and apply Calculus concepts and techniques to curves described in this way.

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, Prentice Hall, 2008.
- *Schaum's Outline of Calculus*, Elliott Mendelson, Frank Ayres, McGraw-Hill, 1999.

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

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

D. Topics Outline

1. **Integration Techniques:** Review of Integration by Substitution and Integration by Parts, Integration of Rational Functions Using Partial Fractions, Trigonometric Techniques of Integration, Integrals Involving Powers of Trigonometric Functions. Integrals Involving Logarithmic, Exponential, and Hyperbolic Functions. Improper Integrals, Numerical Integration.
2. **Applications of Definite Integrals:** Area between Curves, Volumes by Slicing, Volumes Using Cylindrical Shells, Disks and Washers, Arc Length and Surface Area, Work, Moments and Center of Mass.
3. **Infinite Series:** Sequences of Real Numbers, Infinite Series, Remarkable Infinite Series (Geometric Series, P-Series, Alternating Series, Telescoping Series), Convergence Tests (Ratio Test, Root Test, Comparison and Limit Comparison Test, Integral Test), Power Series, Taylor Series, Representation of Functions as Infinite Series, Differentiation and Integration of Power Series, Taylor and Maclaurin Series, Taylor Expansion of Differentiable Functions and Analysis of Remainder.
4. **Parametric Equations and Polar Coordinates:** Plane Curves and Parametric Equations, Calculus and Parametric Equations, Arc Length and Surface in Parametric Equations, Polar Coordinates, Calculus and Polar Coordinates, Conic Sections, Study of Conic Sections in 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 & 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)

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 ≅ 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 Exams
goo.gl/ykm7t3