Department of Mathematics				*Class: I B.Sc. Mathematics*				
Semester	**Course Type**	**Course Code**	**Course Title**	**Credits**	**Contact Hours/ week**	**CIA**	**Ext**	**Total**
I	Core	20U1MMC2	Classical Algebra And Trigonometry	2	4	25	75	100

*Course Objectives***:**

1. To get information about nature of equations and nature and position of roots.
2. To acquire idea to find the roots polynomial and transcendental equations using different methods.
3. To obtain the knowledge of expression for trigonometric functions & hyperbolic functions.

Unit-I:

Formation of Equations-Equations with real coefficients, imaginary roots-Equations with rational coefficients irrational roots- Relation between roots and coefficients-sum of the power of the roots-Newton's theorem (without proof).

Unit-II:

Transformations of equations-Reciprocal equations – Form of the quotient and remainder when a polynomial is divided by a binomial – Removal of terms—Descartes' Rule of Signs - Rolles' theorem - multiple roots.

Unit-III:

Horner's method -Cardon's method- Trigonometrical Method –Solution of biquadratic equations by Ferrari's method.

Unit-IV:

Expansion for $\sin n\theta, \cos n\theta, \tan n\theta$ - Expansion for $\sin^n \theta, \cos^n \theta$ - Expansion for $\sin\theta, \cos\theta, \tan\theta$ in powers of θ

Unit-V:

Hyperbolic function – Relation between hyperbolic function and circular trigonometric functions – Inverse hyperbolic functions-Logarithm of a complex number

Text Books:

1. T. K. Manicavachagom Pillay,T. Natarajan, K.S. Ganapathy Algebra Vol. I, 2011 Edition, S. Viswanathan (Printers & Publishers) Pvt. Ltd.
   Chapters: 6(6.1-6.11, 6.13, 6.14- 6.16, 6.18-6.19, 6.24- 6.26, 6.30, 6.34 &6.35).
2. S. Arumugam, Thangapandi Isaac, Trigonometry, 2012 Edition, New Gamma Publishing House.
   Chapters: 1, 2, 3.

Reference Books:
1. M. K. Venkatraman, Manorama Sridhar, Classical Algebra & Trigonometry, 1st Edition 2002, The National Publishing Company.
2. T. K. Manicavachagom Pillai, Trigonometry, 1997 Edition, S. Viswanathan (Printers & Publishers) Pvt.Ltd.
3. T. Veerarajan, Algebra &Trigonometry, 2020 Edition, Yes Dee publishing Pvt. Ltd.

Web Resources:
1. http://www.freebookcentre.net/maths-books-download/Lecture-Notes-on-Trigonometry.html
2. http://www.universityofcalicut.info/SDE/VI%20Sem.%20B.Sc%20Maths%20-%20Additional%20Course%20in%20lie%20of%20Project%20-Theory%20of%20equations%20&%20fuzzy%20set.pdf

Pedagogy

Lecture, Seminar, Quiz, Problem Solving, Tutorial, Group Discussion, PPT.

Course Learning Outcomes

On the successful completion of the course. Students will be able to

Number	Course Learning outcome	Knowledge Level
CLO1	Find the roots from the relation between roots and coefficients of various equations.	Upto K3
CLO2	Determine the roots by studying the nature of equations, Solving Reciprocal equations and Transformations of equations.	Upto K3
CLO3	Solving the various types equation using different techniques, viz., diminishing the roots, transforming the equation to Quadratic equation.	Upto K4
CLO4	Expression for trigonometric functions of multiple of θ, powers of trigonometric functions and expansion of trigonometric functions in powers of θ.	Upto K3
CLO5	Find the relation between trigonometric functions, hyperbolic functions and inverse hyperbolic functions.	Upto K3

K1- Remembering and recalling facts with specific answers
K2 –Basic understanding of facts and stating main ideas with general answers
K3 –Application oriented – solving problems
K4- Examining, analyzing, presentation and make inference with evidences.

**Mapping of Course Learning Outcomes (CLOs) with Program Outcomes &
Program Specified Outcomes(PSOs)**

CLOs/POs &PSOs	PO 1	PO 2	PO 3	PO 4	PO 5		PSO 1	PSO 2	PSO 3	PS0 4	PSO 5	PSO 6	PSO 7
CLO1	3	2			2		3	2	3	1	1	3	1
CLO2	3	2			2		3	2	3	1	1	3	1
CLO3	3	2			2		3	2	3	1	1	3	1
CLO4	3	2			3		3	2	3	1	1	3	1
CLO5	3	2			3		3	2	3	1	1	3	1

1. Basic level   2. Intermediate level   3. Advance level

Lesson Plan

Units	Description	Hours	Total Hours	Pedagogy
I	Formation of Equations	2	12	Lecture
	Equations with real coefficients, imaginary roots	2		Lecture
	Equations with rational coefficients irrational roots	2		Lecture
	Relation between roots and coefficients	2		Lecture
	sum of the power of the roots	2		Lecture
	Newton's theorem (without proof)	2		Lecture& Group Discussion
II	Transformations of equations	2	12	Lecture
	Reciprocal equations	2		Lecture& Seminar
	Form of the quotient and remainder when a polynomial is divided by a binomial	2		Lecture
	Removal of terms	1		Lecture
	Descartes' Rule of Signs	2		Lecture
	Rolles' theorem	1		Lecture& Seminar
	multiple roots	2		Lecture & Group Discussion
III	Horner's method	3	12	Lecture
	Cardon's method	3		Lecture
	Trigonometrical Method	3		Lecture
	Solution of biquadratic equations by Ferrari's method	3		Lecture& Group Discussion
IV	Expansion for $\sin n\theta, \cos n\theta, \tan n\theta$ - -	4	12	Lecture &Seminar
	Expansion for $\sin^n \theta, \cos^n \theta$	4		Lecture & Seminar
	Expansion for $\sin\theta, \cos\theta, \tan\theta$ in powers of θ	4		Lecture & Group Discussion
V	Hyperbolic functions	3	12	Lecture
	Relation between hyperbolic function and circular trigonometric functions	3		Lecture& Seminar
	Inverse hyperbolic functions	3		Lecture
	Logarithm of a complex number	3		Lecture& Group Discussion
Total			**60**	

Course Designer: Dr. U. Karthik Raja, Assistant professor, Department of Mathematics.