Course Outcome(s)	Specific learning outcomes for a Master's Dissertation are for the student to demonstrate: Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work; Deeper knowledge of methods in the major subject/field of study; A capability to contribute to research and development work; The capability to use a holistic view to critically, independently and creatively identify, formulate and deal with complex issues; The capability to plan and use adequate methods to conduct qualified tasks in given frameworks and to evaluate this work; The capability to create, analyse and critically evaluate different technical/architectural solutions; The capability to critically and systematically integrate knowledge; A consciousness of the ethical aspects of research and development work. Developing capability for undertaking deep study of a specific topic, procuring relevant literature, analysing available results, preparation of scientific report etc
Syllabus: No Syllabus can be prescribed for Project work. It will depend on the specific project chosen by the student in consultation with the faculty guide.	

Code:MAT5001: Algebraic Geometry Prerequisites: Algebra I & Algebra II, Topology	L	T	P	Credit
	3	2	0	4

Course Category	Elective
Course Type	Theory
Course Objective	Algebraic geometry is the study of geometric spaces defined by polynomial equations. It is a central topic in mathematics with strong ties to differential and symplectic geometry, topology, number theory, and representation theory. It is also a very important source of examples throughout mathematics. The aim of this course will be to learn algebraic geometry through the study of key examples
Course Outcome(s)	The student: masters fundamental techniques within classical algebraic geometry; is able to argue mathematically correct and present proofs and reasoning; has solid experience and training in reasoning with geometric

	structures

Syllabus:

Varieties: Affine and projective varieties, coordinate rings, morphisms and rational maps, local ring of a point, function fields, dimension of a variety. Curves: Singular points and tangent lines, multiplicities and local rings, intersection multiplicities, Bezout's theorem for plane curves, Max Noether's theorem and some of its applications, group law on a nonsingular cubic, rational parametrization, branches and valuations.

Text books:

1. S. S. Abhyankar, Algebraic Geometry for Scientists and Engineers, American Mathematical Society, 1990.
2. I. R. Shafarevich, Basic Algebraic Geometry 1: Varieties in Projective Space, Springer, 2013.

References:

1. W. Fulton, Algebraic Curves, Benjamin-Cummings Publishing, 1974.
2. J. Harris, Algebraic Geometry: A First Course, Springer-Verlag, 1992.
3. M. Reid, Undergraduate Algebraic Geometry, Cambridge University Press, Cambridge, 1990. 4. R.J. Walker, Algebraic Curves, Springer- Verlag, Berlin, 1950.

Code:MAT5002: Analytic Number Theory Prerequisites: Number theory.	L	T	P	Credit
	3	2	0	4

Course Category	Elective
Course Type	Theory
Course Objective	The aim of this course will be mastering the students to handle multiplicative functions, to deal with Dirichlet series as functions of a complex variable
Course Outcome(s)	The course will teach students to handle multiplicative functions, to deal with Dirichlet series as functions of a complex variable, and to prove the Prime Number Theorem and simple variants.