

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY
DESIGN AND MANUFACTURING (IIITDM) KANCHEEPURAM

INTRODUCTION OF NEW COURSE

Course Title	Algebraic Number Theory	Course Code				
Dept./ Specialization	Dept. of SH, Mathematics	Structure (LTPC)	3	1		4
To be offered for	Ph.D.	Status	Core <input type="checkbox"/>		Elective <input checked="" type="checkbox"/>	
Faculty Proposing the course	M. Subramani, Dept. of SH (Mathematics)	Type	New <input checked="" type="checkbox"/>		Modification <input type="checkbox"/>	
Recommendation from the DAC		Date of DAC	17/07/2023			
External Expert(s)	1. Prof. K. Srinivas, Professor, IMSc, Chennai 2. Dr. Narasimha Kumar, Associate Professor, IIT, Hyderabad.					
Pre-requisite	Previous exposure to abstract algebra, field theory, and Galois theory is absolutely required.	Submitted for approval				
Learning Objectives	The course will introduce the student to basic concepts in algebraic number theory such as norms, traces and discriminants, localization, Dedekind domains, local fields and their applications.					
Learning Outcomes	Algebraic numbers, algebraic integers and algebraic number fields; Integral bases; Dedekind domains; Ideal class groups; Dirichlet Unit theorem					
Contents of the course (With approximate break-up of hours for L/T/P)	Finite extensions, Localization, Norms, Traces and Discriminants, Integral extensions, Dedekind domains, Fractional ideals, Prime decomposition [14L+4T] Ramification theory, Factorization of prime ideals in Galois extensions, Ideal class group, Minkowski theory. [14L+5T] The Dirichlet unit theorem, cyclotomic extensions, quadratic reciprocity. Absolute values and discrete valuations, local fields, and global fields. [14L+5T]					
Text Book	1. Gerald J. Janusz, Algebraic Number Fields, 2 nd Edition, American Mathematical Society-1996 2. Daniel A. Marcus, Number Fields, 2 nd Edition, Springer-2018					
Reference Books	1. M. Ram Murty and J. Esmonde Problems in Algebraic Numbers Theory, Springer-Verlag (2004). 2. Robert B. Ash, A Course in Algebraic Number Theory, Dover publications (2010). 3. Frohlich and Taylor, Algebraic Number Theory, 1 st edition Cambridge (1991).					