

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

INTRODUCTION OF NEW COURSE

Course Title	Topics in Analytic Number Theory	Course No	MAT6XXX			
Specialization	CSE/MAT	Structure (LTPC)	3	0	0	3
To be offered for	DD / PG / PhD	Status	Core <input type="checkbox"/>		Elective <input checked="" type="checkbox"/>	
Faculty Proposing the course	M. Subramani	Type	New <input checked="" type="checkbox"/>		Modification <input type="checkbox"/>	
Date of DAC	17/01/2020	Members Present in DAC	All Dept. Members			
		External Member:	Prof. K. Srinivas, IMSc, Chennai			
Pre-requisite	CoT	Submitted for approval	41 st Senate			
Learning Objectives	To define fundamental objects appearing in the course such as the Gamma function, Theta functions, the Riemann Zeta function, Dirichlet L-functions, Dirichlet characters, and describe the most important properties of these.					
Learning Outcomes	It will prepare the students to read research papers in analytic number theory.					
Contents of the course <i>(With approximate break-up of hours)</i>	<p>Arithmetic functions: Introduction and basic examples, Additive and multiplicative functions, The Moebius function, The Euler phi (totient) function, The von Mangoldt function, The divisor and sum-of-divisors functions, The Dirichlet product of arithmetic functions. Asymptotic estimates, Euler's summation formula, The summation by parts formula. (10)</p> <p>Prime numbers, distribution of prime numbers, Chebyshev type estimates, Prime Number Theorem (10)</p> <p>Dirichlet Series, Dirichlet L-functions, Analytic properties Dirichlet series and Dirichlet L-functions, mean values of Dirichlet series. (12)</p> <p>Riemann Zeta function, analytical properties of Riemann Zeta function, Zeros of Riemann Zeta function, Riemann Hypothesis and some consequences of Riemann Hypothesis. (10)</p>					
Text Books	<ol style="list-style-type: none"> 1. Tom M. Apostol: "Introduction to Analytic Number Theory", Springer International Student Edition, 1998 2. E.C.Titchmarsh: "The Theory of Riemann Zeta Function"(second edition), revised by D.R.Heath-Brown,Clarendon Press, Oxford, 1997 					
Reference Books	<ol style="list-style-type: none"> 1. Analytic Number Theory, Henryk Iwaniec, Emmanuel Kowalski, Colloquium Publications, 2004. 2. Paul T.Bateman, Harold G. Diamond: "Analytic Number Theory: An Introductory Course" World Scientific, 2004 					