

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF MATHEMATICS **TEACHING PLAN**

Cours Code	Aller State Control	Course Title	Semester	Branches	Contact Periods /Week	155 N . 150 CA	ademic Year	Date of commencement of Semester	
23BS4T02		NUMBER THEORY AND ITS APPLICATIONS	IV	CSE-CS	60/6	20	24-25	6 -12-2024	
COURS	E OI	JTCOMES: At the	e end of thi	s course, the student	will be ab	le to			
CO1		Apply the know	ledge of G	CD and Prime Factor	rization (K	(3).			
CO2		Understand prin	principles on congruence (K2).						
CO3 Apply the know		Apply the know	ledge of co	ongruence application	ns (K3).		1	ı	
CO4		Understand the	finite fields	and primality (K2).			1		
CO5	, L	Develop various	s encryption	n methods and its app	olications	(K3).			
UNIT	- Y	Out Comes / Bloom's Level	Topic No.	Topics/Activit	est r	Text Book/ Refere nce	Contact Hour	Delivery Method	
			INTE	GERS, GREATEST	COMM	ON DIX	/ISORS	AND PRIME	
	l. No		V	FAC	CTORIZ				
		1.94 1. q. **	1.1	The well-ordering pr	CTORIZA		1		
		1.55 1. 14 8. 1	1.1	FACT The well-ordering properties Divisibility -	operty	ATION	V VI T		
	11	1.55 1.41 28.1	1.1	The well-ordering pr	roperty	ATION T ₁ &T ₂	1		
	CO	o1: At the end of	1.1	FACT The well-ordering properties Divisibility -	croperty tegers	$\frac{\text{ATION}}{\text{T}_1 \& \text{T}_2}$ $\frac{\text{T}_1 \& \text{T}_2}{\text{T}_1 \& \text{T}_2}$	1		
	this	o1: At the end of s course, the	1.1	FACT The well-ordering properties of integers. FACT The well-ordering properties of integers. FACT The well-ordering properties of integers.	croperty tegers s with	$\begin{array}{c} \mathbf{ATION} \\ \mathbf{T}_1 \& \mathbf{T}_2 \\ \mathbf{T}_1 \& \mathbf{T}_2 \\ \mathbf{T}_1 \& \mathbf{T}_2 \end{array}$	1 1 1		
I.	this	s course, the dent will be able	1.1	FACT The well-ordering properties of integers Prime numbers	croperty tegers s with	ATION $T_1 \& T_2$	1 1 1		
I.	this stud to a kno	s course, the dent will be able apply the owledge of GCD I Prime	1.1 1.2 1.3 1.4 1.5	FACT The well-ordering properties of integers. FACT The well-ordering properties of integers. FACT The well-ordering properties of integers.	tegers s with	$\begin{array}{c} \mathbf{ATION} \\ \mathbf{T}_1 \& \mathbf{T}_2 \end{array}$	1 1 1 1	Chalk & Talk,Active learning ,PPT	
I	this stud to a kno	s course, the dent will be able apply the owledge of GCD	1.1 1.2 1.3 1.4 1.5	The well-ordering pr Divisibility - Representation of int Computer operations integers Prime numbers Greatest common div The Euclidean algori	tegers s with visors - ithm	ATION T ₁ &T ₂	1 1 1 1 1	Chalk & Talk, Active	
I	this stud to a kno	s course, the dent will be able apply the owledge of GCD I Prime	1.1 1.2 1.3 1.4 1.5	The well-ordering pr Divisibility - Representation of int Computer operations integers Prime numbers Greatest common div The Euclidean algori equations The fundamental the	tegers s with visors - ithm	T1&T2	1 1 1 1 1 1	Chalk & Talk,Active learning,PPT	
I.	this stud to a kno	s course, the dent will be able apply the owledge of GCD I Prime	1.1 1.2 1.3 1.4 1.5	The well-ordering pr Divisibility - Representation of int Computer operations integers Prime numbers Greatest common div The Euclidean algoriequations The fundamental the of arithmetic	tegers s with visors - ithm eorem	T1&T2	1 1 1 1 1 1	Chalk & Talk,Active learning ,PPT	
I.	this stud to a kno	s course, the dent will be able apply the owledge of GCD I Prime	1.1 1.2 1.3 1.4 1.5 1.6 1.7	The well-ordering properties of integers Prime numbers Greatest common divided and algorized and algorized and arithmetic Factorization of integers	tegers s with visors - ithm eorem gers bers	T1ON T1&T2	1 1 1 1 1 1	Chalk & Talk,Active learning,PPT	



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	21	CONGRUENCE					
		2.1	Introduction to congruence	$T_1\&T_2 \ T_1\&T_2$	1		
-7	CO2: At the end of	-		$T_1&T_2$	1	Chalk & Talk,Active learning,PPT	
ş 11	this course, the student	2.2	Linear congruence	$T_1&T_2$	1		
п	will be able to understand principles on congruence (K2)			$T_1\&T_2$	1		
				$T_1&T_2$	1		
		2.3	The Chinese remainder	$T_1\&T_2$	1	and Tutorial	
_		1	theorem	$T_1\&T_2$	1	and rutorial	
	i fi dining a i dili	_ 71 v	ne 11 91 S	$T_1&T_2$	1 1	13.11.	
		2.4	Systems of linear	$T_1&T_2$	1	4	
-	n di tra		congruence	$T_1\&T_2$	1	1 ' '	
				$T_1&T_2$	1	X-1	
					12		
	7 11	(4)	APPLICATIONS O	F CONGI	RUENC	E	
		3.1	Divisibility tests	T ₁ &T ₂	1		
	- 1 min 10	3.2	The perpetual calendar	T ₁ &T ₂	1		
			Round-robin tournaments	T ₁ &T ₂	1		
		3.3		$T_1&T_2$	1	0.17	
	CO3: At the end of		Computer file storage and	$T_1&T_2$	1		
IП	this course, the	3.4	hashing functions.	T ₁ &T ₂	1	Chalk &	
	student will be able to apply the knowledge of	3.5	Wilson's theorem and Fermat's little theorem	T ₁ &T ₂	1	Talk, Active learning, PPT	
	congruence	3.6	Pseudo primes	T ₁ &T ₂	1	and Tutorial	
	applications (K3)	3.7	Euler's theorem	T ₁ &T ₂	1		
		3.8	Euler's phi-function	T ₁ &T ₂	1		
	e (9 i)	3.9	The sum and number of divisors	T ₁ &T ₂	1 ,		
	6	3.10	Perfect numbers and Mersenne primes	T ₁ &T ₂	1		
	10	15.90	11 2		12		
			FINITE FIELDS & PRIMALITY, FACT	TORING	h		
		4.1	Finite fields	T ₁ &T ₂	1		
117				$T_1&T_2$	1		
IV	CO4: At the end of	4.2	Quadratic residues and reciprocity	T ₁ &T ₂	1		
	this course, the		reciprocity	T ₁ &T ₂	1		
	student will be able to understand the finite	4.3	Pseudo primes	T ₁ &T ₂	1		
	understand the finite		, ,	$T_1&T_2$	1		



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	fields and primality	4.4	rho method	T ₁ &T ₂	1	Chalk &		
- "	(K2)	184	ALC: The second			Talk, Active		
-	₹,5	4.5	Fermat factorization and	T ₁ &T ₂	1	learning ,PPT and Tutorial		
			factor bases.	T ₁ &T ₂	1	and rutorial		
		ractor cases.		T ₁ &T ₂	1			
verific.	sar g			Total	10			
			CRYPT	OLOGY				
	9	5.1	Basic terminology	T ₁ &T ₂	1	1		
1	- I		2 4 2	T ₁ &T ₂	1			
-	CO5: At the end of	5.2	complexity theorem	T ₁ &T ₂	1			
	this course, the student will be able to	5.3	Character ciphers	T ₁ &T ₂	1			
	develop various			$T_1\&T_2$	1	Chalk &		
17		5.4	Block ciphers	$T_1&T_2$	1	Talk, Active learning, PPT		
V	encryption methods			$T_1&T_2$	1	and Tutorial		
	and its applications	5.6	Exponentiation ciphers	$T_1&T_2$	1			
	(K3)	5.7	Public- key cryptography	T ₁ &T ₂	1			
			Discrete logarithm	$T_1&T_2$	1	-		
		5.8	_	$T_1&T_2$	1			
		5.9	Knapsack ciphers	$T_1&T_2$	1			
		5.10	RSA algorithm.	T ₁ &T ₂	1			
				Total	14			
			Cumulative Proposed	Periods	60			
Text Boo	ks:							
S.No.			E, EDITION, PUBLISHER, Y					
T1						nation systems &		
	Bell laboratories.							
T2		e in Nu	mber theory & Cryptography, S	pringer.				
Referenc		, paracera -	DEFENDA DAME TOWN					
S.No.		AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION						
R1	27 36 (554)	Herbert S. Zuckerman Hugh L. Montgomery, Ivan Niven, An Introduction To The Theory Of						
	Numbers, wiley publ	ishers						
R2 Tom M Apostol ,Intr		roduction to Analytic number theory, springer .						
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1	https://youtu.be/BI84sbsOtGQ?si=X2nZ1fS5rI3_aNTs
2	https://youtu.be/-SpWfD4WsmM?si=a9OBD9sXJD8-dTge
3	https://youtu.be/6v4w0BkWall?si=vpxeJ5sL1Jur2fCF
4	https://youtu.be/6 Cxj5WKpIw?si=n TqFlexk-5OjCa_

	X	Name	Signature with Date
i.	Faculty	P.Durga Bhavani	li an Cl.
ii.	Course Coordinator	P.Durga Bhavani	P. Den Ch
iii.	Module Coordinator	Da. E.M. Victoria	E Jeul a.
iv.	Head of Department	Dr. V.Swaminadham	V. Jwanings