

SWARNANDHRA

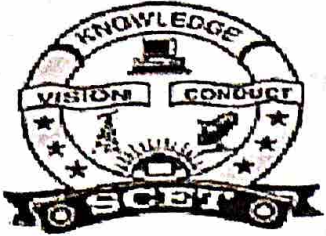
COLLEGE OF ENGINEERING & TECHNOLOGY (AUTONOMOUS)

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

Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
23BS4T02	NUMBER THEORY AND ITS APPLICATIONS	IV	CSE-CS	60/6	2024-25	16-12-2024
COURSE OUTCOMES: At the end of this course, the student will be able to						
CO1	Apply the knowledge of GCD and Prime Factorization (K3).					
CO2	Understand principles on congruence (K2).					
CO3	Apply the knowledge of congruence applications (K3).					
CO4	Understand the finite fields and primality (K2).					
CO5	Develop various encryption methods and its applications (K3).					
UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO1: At the end of this course, the student will be able to apply the knowledge of GCD and Prime Factorization (K3).	INTEGERS, GREATEST COMMON DIVISORS AND PRIME FACTORIZATION				
		1.1	The well-ordering property	T ₁ &T ₂	1	Chalk & Talk, Active learning, PPT and Tutorial
		1.2	Divisibility - Representation of integers	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		1.3	Computer operations with integers	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		1.4	Prime numbers	T ₁ &T ₂	1	
		1.5	Greatest common divisors - The Euclidean algorithm equations	T ₁ &T ₂	1	
		1.6	The fundamental theorem of arithmetic	T ₁ &T ₂	1	
		1.7	Factorization of integers and the Fermat numbers	T ₁ &T ₂	1	
T ₁ &T ₂	1					
1.8	Linear Diophantine equations	T ₁ &T ₂	1			
		T ₁ &T ₂	1			
					12	

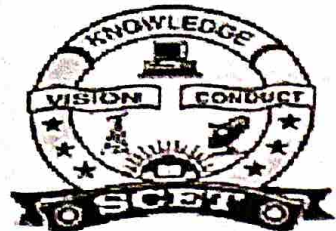


SWARNANDHRA

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)

		CONGRUENCE				
II	CO2: At the end of this course, the student will be able to understand principles on congruence (K2)	2.1	Introduction to congruence	T ₁ &T ₂	1	Chalk & Talk, Active learning, PPT and Tutorial
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		2.2	Linear congruence	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		2.3	The Chinese remainder theorem	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		2.4	Systems of linear congruence	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
				T ₁ &T ₂	1	
				12		
		APPLICATIONS OF CONGRUENCE				
III	CO3: At the end of this course, the student will be able to apply the knowledge of congruence applications (K3)	3.1	Divisibility tests	T ₁ &T ₂	1	Chalk & Talk, Active learning, PPT and Tutorial
		3.2	The perpetual calendar	T ₁ &T ₂	1	
		3.3	Round-robin tournaments	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		3.4	Computer file storage and hashing functions.	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		3.5	Wilson's theorem and Fermat's little theorem	T ₁ &T ₂	1	
		3.6	Pseudo primes	T ₁ &T ₂	1	
		3.7	Euler's theorem	T ₁ &T ₂	1	
		3.8	Euler's phi-function	T ₁ &T ₂	1	
3.9	The sum and number of divisors	T ₁ &T ₂	1			
3.10	Perfect numbers and Mersenne primes	T ₁ &T ₂	1			
				12		
		FINITE FIELDS & PRIMALITY, FACTORING				
IV	CO4: At the end of this course, the student will be able to understand the finite	4.1	Finite fields	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		4.2	Quadratic residues and reciprocity	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		4.3	Pseudo primes	T ₁ &T ₂	1	
T ₁ &T ₂	1					



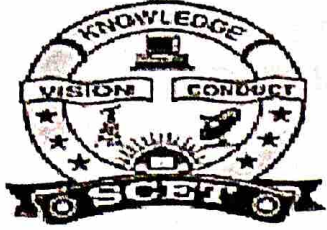
SWARNANDHRA

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)

	fields and primality (K2)	4.4	rho method	T ₁ &T ₂	1	Chalk & Talk, Active learning, PPT and Tutorial
				T ₁ &T ₂	1	
		4.5	Fermat factorization and factor bases.	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
Total					10	
CRYPTOLOGY						
V	CO5 : At the end of this course, the student will be able to develop various encryption methods and its applications (K3)	5.1	Basic terminology	T ₁ &T ₂	1	Chalk & Talk, Active learning, PPT and Tutorial
				T ₁ &T ₂	1	
		5.2	complexity theorem	T ₁ &T ₂	1	
		5.3	Character ciphers	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		5.4	Block ciphers	T ₁ &T ₂	1	
				T ₁ &T ₂	1	
		5.6	Exponentiation ciphers	T ₁ &T ₂	1	
		5.7	Public- key cryptography	T ₁ &T ₂	1	
		5.8	Discrete logarithm	T ₁ &T ₂	1	
				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 Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
T1	Kenneth H Rosen, Elementary number theory and its applications, AT & T Information systems & Bell laboratories.					
T2	Neal Koblitz ,A course in Number theory & Cryptography, Springer.					
Reference Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
R1	Herbert S. Zuckerman Hugh L. Montgomery, Ivan Niven, An Introduction To The Theory Of Numbers, wiley publishers					
R2	Tom M Apostol ,Introduction to Analytic number theory, springer .					
R3	VK Krishnan, Elementary number theory, Universities press.					



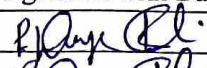

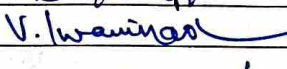

SWARNANDHRA

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)

Web Details	
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

	Name	Signature with Date
i. Faculty	P.Durga Bhavani	
ii. Course Coordinator	P.Durga Bhavani	
iii. Module Coordinator	Dr. E.M.Victoria	
iv. Head of Department	Dr. V.Swaminadham	


Principal