



RAGHU ENGINEERING COLLEGE

AUTONOMOUS

(Approved by AICTE, New Delhi, Accredited by NBA (CIV,ECE,MECH,CSE), NAAC with 'A+' grade
& Permanently Affiliated to JNTU-GV, Vizianagaram)

Dakamarri, Bheemunipatnam Mandal, Visakhapatnam Dist. – 531 162 (A.P.)

Ph: +91-8922-248001, 248002 Fax: + 91-8922-248011

E-mail: principal@raghuenggcollege.com website: www.raghuenggcollege.com

RAGHU ENGINEERING COLLEGE (AUTONOMOUS)

VISAKHAPATNAM

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INSTITUTE VISION

Envisioning to be a world class technical institution by synergizing quality education with ethical values.

INSTITUTE MISSION

- To encourage training and research in cutting-edge technologies.
- To develop and strengthen strategic links with the industry.
- To kindle the zeal among the students and promote their quest for academic excellence.
- To encourage extra-curricular activities along with good communication skills.

QUALITY POLICY

RAGHU Engineering College underscores ethical values along with innovative teaching through an interactive, activity-based pedagogy; establishes the best of infrastructural facilities, inculcates engineering temper among the students through the use of the latest Information and Communication Technologies, and strives for an efficient, responsive and transparent administration in all areas.



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Department of Computer Science and Engineering
VISION
To generate competent professionals to become part of the industry and research organizations at the national and international levels.
MISSION
To impart high quality professional training in undergraduate level with emphasis on basic principles of computer science and Engineering and to foster leading edge research in the fast-changing field. To inculcate professional behavior, strong ethical values, innovative research capabilities and leadership abilities in the young minds so as to work with a commitment.
<ul style="list-style-type: none">● M1:To impart high quality professional training at undergraduate level with emphasis on basic principles of computer science and Engineering and to foster leading edge research in the fast-changing field.● M2:To inculcate innovative research capabilities and leadership abilities in the young minds so as to work with a commitment.● M3:To inculcate professional behavior, strong ethical values in the young minds so as to work with a commitment.
PROGRAMME EDUCATIONAL OBJECTIVES(PEOs)
<p>PEO 1: To produce graduates with a strong foundation in mathematics, science, engineering fundamentals, laboratory and work-based experiences to formulate and solve engineering problems in computer science engineering domains and shall have proficiency in implementation software tools and languages.</p> <p>PEO 2: To progressively impart training to the students for success in various engineering positions within the core areas in computer science engineering, computational or adapting to the latest trends by learning themselves.</p> <p>PEO 3: To produce graduates having the ability to pursue advanced higher studies and research. To have professional and communication skills to function as leaders and members of multidisciplinary teams in engineering and other industries with strong work ethics, organizational skills, teamwork, and understanding of the importance of being a thorough professional.</p>



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MAPPING OF MISSION STATEMENTS WITH PEOs

MS/PEO	PEO 1	PEO 2	PEO 3
MS 1	3	2	2
MS 2	2	3	2
MS 3	2	2	3

1-Slight ,2- Moderate, 3- Substantial



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PROGRAM OUTCOMES	
Graduates of Computer Science and Engineering Will:	
PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to solve complex engineering problems.
PO 2	Problem analysis: Identity, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and the cultural, societal, and environmental concerns.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods, including design of experiments, analysis, interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics, responsibilities, and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend



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	and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's work as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
PROGRAM SPECIFIC OUTCOMES (PSOs)	
PSO 1: Apply the concepts and techniques of the Computer Science & Engineering branch and the Mathematical foundations in the significant domains to address the complex engineering problems.	
PSO 2: Employ emerging computer languages, computer networks, database management systems and platforms in developing innovative career prospects as an entrepreneur.	
PSO 3: Apply the knowledge of interdisciplinary skills, and domain-specific tools in working system processes to implement and deploy a quality-based software product to meet evolving needs.	

Mapping of PEOs with POs and PSOs

PEO/PO	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2	PSO-3
PEO 1	3	3	3	3	2	2	2	2		2		3	3	2	2
PEO 2	2	3	3	3	2	2	2	2	3	2	3	3	3	3	3
PEO 3	3	2	2	3	2	2	2	3	3	3	3	3	3	3	3

1-Slight , 2- Moderate, 3- Substantial

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23BS113 – NUMBER THEORY AND IT'S APPLICATIONS							
Programme & Branch	B.Tech. & CSC	Sem	Category	L	T	P	Credit
Prerequisites	23BS101- LA & C 23BS102 - DE & VC	4	HSS	3	0	0	3
Course Objectives : <ol style="list-style-type: none"> This course enables the students to learn the concepts of number theory and its applications to information security. 							
Preamble :	Basic algebraic Equations, Probability, random variables (discrete and continuous) and probability distributions.						
Course Contents:							
Unit-1	Integers, Greatest common divisors and prime Factorization					Contact Hours: 9	
The well-ordering property-Divisibility-Representation of integers-Computer operations with integers-Prime numbers-Greatest common divisors-The Euclidean algorithm -The fundamental theorem of arithmetic-Factorization of integers and the Fermat numbers-Linear Diophantine equations.							
Unit-2	Congruences					Contact Hours: 9	
Introduction to congruences -Linear congruences-The Chinese remainder theorem-Systems of linear congruences.							
Unit-3	Applications of Congruences					Contact Hours: 9	
Divisibility tests-The perpetual calendar-Round-robin tournaments-Computer file storage and hashing functions. Wilson's theorem and Fermat's little theorem- Pseudo primes- Euler's theorem- Euler's p hi-function- The sum and number of divisors- Perfect numbers and Mersenne primes.							
Unit-4	Finite fields & Primality, factoring					Contact Hours: 9	
Finite fields- quadratic residues and reciprocity-Pseudo primes-rho method-Fermat factorization and factor bases.							
Unit-5	Cryptology					Contact Hours: 9	
Basic terminology-complexity theorem-Character ciphers-Block ciphers-Exponentiation ciphers-Public-key cryptography-Discrete logarithm-Knapsack ciphers- RSA algorithm-Some applications to computer science.							
Total Hours: 45							
Text Books:							
1	Kenneth H Rosen, Elementary number theory and its applications, AT & T Information systems & Bell laboratories.						
2	Neal Koblitz, A course in Number theory & Cryptography, Springer						
3	"Elementary Number Theory" by David M. Burton.						



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Reference Books:

1	Herbert S. Zuckerman , Hugh L. Montgomery , Ivan Niven , An Introduction To The Theory Of Numbers, wiley publishers
2	Tom M Apostol, Introduction to Analytic number theory- springer
3	VK Krishnan, Elementary number theory, Universities press

Web References :

1	https://www.slideshare.net/ItishreeDash3/a-study-on-number-theory-and-its-applications
2	https://archive.nptel.ac.in/courses/111/103/111103020/
3	https://archive.nptel.ac.in/courses/111/101/111101137/

COURSE OUTCOMES:

Upon completion of the course, students shall have ability to

BT Mapped

(Highest Level)

CO 1	Understand concepts related to primality, divisibility, and Greatest common divisors.	L2, L3
CO 2	Comfortable with divisibility proofs that use a number of different means, including induction, congruences, and divisibility tests	L3, L5
CO 3	Develop the knowledge to apply various applications of Congruences.	L3
CO 4	Analyze the Finite fields & Primality, factoring in the related applications	L2, L3
CO 5	Develop various encryption methods and its applications to computer science.	L3, L5



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Mapping of Cos with POs and PSOs

COs/POs	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12	PSO-1	PSO-2
CO 1	2	2	1					1	1			1		
CO 2	2	2	1					1	1			1		
CO 3	3	2	1					1	1			1		
CO 4	2	2	1					1	1			1		
CO 5	2	2	1					1	1			1		
1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy														

ASSESSMENT PATTERN – THEORY

TEST	Remembering (K1)%	Understanding (K2)%	Applying (K3)%	Analyzing (K4)%	Evaluating (K5)%	Creating (K6)%	Total%
MID-1	6	9	85				100
MID-2	6	9	85				100
SEE	10	10	80				100
*± 3% may be varied							

(signature)
Head of the Department
(Seal/Stamp)

(signature)
Principal
(Seal/Stamp)