# 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.

- 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)

**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.

**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.

**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.

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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**- Substatial

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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 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. |

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| **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. |
| **PS0 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**- Substatial

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## (23ES111) Digital Logic & Computer Organization

(Common to CSE, CSM, CSD, CSC)

| Programme & Branch | B.Tech & CSE | Sem | Category | L | T | P | Credit |
|---|---|---|---|---|---|---|---|
| **Prerequisites:** | Computer Organization | **3** | Engineering Science | **2** | **0** | **0** | **2** |

Preamble : **The main objectives of the course is to make student**

**Course Objectives:**

- Principles and the Implementation of Computer Arithmetic.
- Operations of CPU including RTL, ALU, Instruction Cycle and Busses.
- Fundamentals of different Instruction Set Architectures and their relationship to the CPU Design.
- Memory System and I/O Organization.
- Principles of Multiprocessor Systems.

**Course Contents:**

| | | |
|---|---|---|
| **Unit-1** | Number Systems and Codes Decimal, Binary, Octal, and Hexa-decimal number systems and their conversions, ASCII code, Excess-3 code, Gray code, Complement representation of negative numbers: Signed Magnitude, One"s complement method, Two"s complement method, Binary Arithmetic. | Contact Hours: 9 |
| | | |
| **Unit-2** | Boolean Algebra Boolean operations, Boolean functions, algebraic manipulations, min-terms and max-terms, sum-of products and product-of-sum representations, two-input logic gates, NAND/NOR implementations, Minimization of Boolean functions using Karnaugh map, don't- care conditions. | Contact Hours:9 |
| | | |
| **Unit-3** | Basic Structure of Computers: Basic organization of computers, historical perspective, bus structures. Data representation: Data types, complements, fixed point representation, floating point representation, other binary codes, and error detection codes.<br>Computer Arithmetic: Addition, subtraction, multiplication and division algorithms. | Contact Hours:9 |
| | | |
| **Unit-4** | Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, instruction cycle, memory reference instructions, input/output instructions, and interrupt.<br>Memory Organization: Memory hierarchy, main memory, | Contact Hours:9 |

| | | |
|---|---|---|
| | auxiliary memory, associative memory, cache memory, cache memory mappings, and virtual memory. | |
| | | |
| **Unit-5** | Central Processing Unit: General register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, reduced instruction set computer (RISC).<br>Input-Output Organization: Peripheral devices, input-output interface, asynchronous data transfer, modes of data transfer, priority interrupts, and Direct Memory Access (DMA). | Contact Hours:9 |
| | | Total Hours: 45 |

| **Text Books:** | |
|---|---|
| 1 | Computer System Architecture, M. Morris Mano, Third Edition, Pearson, 2008. |
| 2 | Computer Organization, Carl Hamacher, Zvonks Vranesic, Safea Zaky, 5th Edition, McGraw Hill. |
| **Reference Books:** | |
| 1 | Computer Architecture and Organization, John P. Hayes, 3rd Edition, McGraw Hill. |
| 2 | Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI |
| 3 | Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson |
| 4 | Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition. |
| **Web References :** | |
| 1 | https://www.youtube.com/watch?v=eAwtXqmN9Mk&list=PLRvJfry30-23Q0Zn3SCVYiDhbqYJq8ql_ |
| 2 | https://www.youtube.com/watch?v=Ol8D69VKX2k&list=PLBlnK6fEyqRgLLlzdgiTUKULKJPYc0A4q |
| 3 | https://www.youtube.com/watch?v=mBGbK8yfhAA |

| Preamble : | **After completion of the course, students will be able to** | |
|---|---|---|
| **COURSE OUTCOMES:** Upon completion of the course, students shall have ability to | | **BT Mapped** (Highest Level) |
| **CO 1** | Understand significance of number systems, conversions, binary codes | Understanding |
| **CO 2** | Apply different simplification methods for minimizing boolean Functions | Understanding |
| **CO 3** | Understand the architecture of modern computer and understand the arithmetic operations. | Applying |
| **CO 4** | Exemplify in a better way the memory organization is | Applying |

| | | |
|---|---|---|
| | communicating with processing unit. | |
| **CO 5** | Develop a detailed understanding of architecture and functionality of central processing unit and I/O Devices. | Applying |

**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 | PSO 3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CO 1** | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 1 | - |
| **CO 2** | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 1 | - |
| **CO 3** | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 1 | - |
| **CO 4** | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 1 | - |
| **CO 5** | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | 1 | - |
| **1 – Slight, 2 – Moderate, 3 – Substantial, BT- Bloom's Taxonomy** | | | | | | | | | | | | | | | |

| **ASSESSMENT PATERN – THEORY** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **TEST** | **Remembering (K1)%** | **Understanding (K2)%** | **Applying (K3)%** | **Analyzing (K4)%** | **Evaluating (K5)%** | **Creating (K6)%** | **Total%** |
| **MID-1** | **25** | **30** | **30** | **15** | | | **100** |
| **MID-2** | **25** | **30** | **30** | **15** | | | **100** |
| **SEE** | **30** | **35** | **25** | **5** | | | **100** |
| ***± 3% may be varied** | | | | | | | |

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

(Signature)
Principal
(Seal/Stamp)