

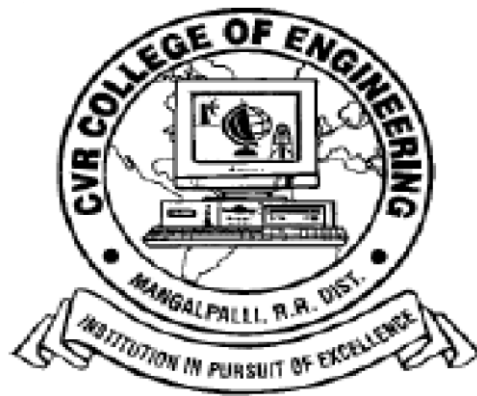
Information Brochure

FOR

B. Tech.

IN

Information Technology



CVR COLLEGE OF ENGINEERING

(AUTONOMOUS)

Vastunagar, Mangalpalli (V), Ibrahimpatan (M),

R.R. District. Pin: 501510 email:

info@cvr.ac.in

Web: <http://cvr.ac.in>

About CVR College of Engineering

Cherabuddi Education Society was registered under Andhra Pradesh (Telangana Area) Public Societies Registration Act with Registrar of Societies at Hyderabad in January 1999, as an NRI promoted society. Dr. Raghava, who is a B.E. (CSE), M.S. (Computer Science), and Ph. D. (Computer Engineering, USA) is the chairman of the institution. He was most recently with Microsoft Corporation, Hyderabad as an Academic Alliance Manager. Previously he was with Intel Corporation for about 12 years. The college was started in the year 2001 with an intake of 220 for four branches of B. Tech. and now has B. Tech. with an intake of 1200 in seven branches. The college also has an intake of 150 in M. Tech. in six specialisations. The college has got NBA accreditation for three years in 2006-07 and

subsequently for two years in 2012-13. The college has also got autonomous status for a period of three years (i.e. 2011-12 to 2013-14) from JNTUH and also subsequently attained autonomy for 6 years (i.e. 2014-15 to 2019-20) from UGC New Delhi.

Introduction to the Department

The Department of Information Technology exhibits a professional quality, sharing of the knowledge, by floating courses for the other departments also. This helps the Department to grow organically with the Institute.

The department of IT was started in 2001 with an initial intake of 60 B. Tech. students. Subsequently in the year 2007-08, the intake was increased to 120. The department is currently headed by Prof. Bipin Bihari Jayasingh. The department has 3 Professors, 5 Associate Professors and 17 Assistant Professors. 4 Associate professors are pursuing their PhD at University of Hyderabad and JNTUH.

The department has 4 laboratories with 75 systems each catering to the department curriculum.

Vision & Mission of the IT Department Vision:

The department aims to produce quality Software Engineers, with an attitude to adapt to ever changing IT needs of local, national and international arena, through teaching, interactions with alumni and industry.

Mission

- To provide a research oriented environment for the faculty.
- To provide a holistic learning environment for students.
- To provide an open ended working environment for innovation.
- To develop into a Center of excellence for Application Development using Open source Technologies.
- To provide quality infrastructure through labs and other resources, and to continuously upgrade to the latest technology requirements.
- To train the students to excel in placements and competitive exams at higher levels.
- To have a healthy industry - institute interaction through faculty development programs, student internships, etc.
- To contribute to the open source community.

Name, designation, telephone numbers and e-mail id of the contact person for IT:

Name : Dr. Bipin Bihari Jayasingh
Designation : Professor & Head of the Department
Telephone No: 08414-252341
e-mail : bipin@cvr.ac.in

List of Faculty

| S. No | Name of the faculty member | Qualification, university, and year of graduation | Designation and date of joining the institution | Specialization | No. of Years of Experience | No. of Ph. D. Students guided for the last 4 years |
|-------|----------------------------|---|---|---|--|--|
| 1 | Prof. U. V. Ramana Sarma | M. Tech., (PhD), OU, 1999 | Professor, 6-7-2006 | Software Engineering, Real Time Systems, Operating Systems and Databases | 14 years of Industry, 25 years of teaching | - |
| 2 | Dr. R. Seetharamaiah | PhD, HCU, 2014 | Professor, 01-11-2001 | Distributed systems, Microprocessors and micro controllers, Embedded systems, Computer architecture | Industry 13 years, Teaching 15 years | - |
| 3 | Dr. Bipin Bihari Jayasingh | M. Tech, JNTU, PhD, 2007 | Professor & Head, IT Dept, 26-6-2006 | Network security, computer networks, DMDW and computer forensics | 15 years | 5(Guiding) |
| 4 | Mr. C.V.S. Satyamurthy | M. Tech., (PhD), JNTU, 2000 | Assoc. Prof., 21-4-2007 | Software Engineering | 06 years of Industry, 16 years of teaching | - |
| 5 | Mr. B. Vikranth | M. Tech, (PhD), OU, 2006 | Assoc. Prof., 06.08.2004 | Linux Programming | 13 years Teaching 5 Years Research | - |
| 6 | Mr. K. Brahmanand | M. Tech, HCU, 1993 | Assoc. Prof., 01-6-2005 | Software engineering | 9 years Teaching, 9 years Industry | - |
| 7 | Mrs. H. N. Lakshmi | M.S, BITS (PhD) 1998 | Assoc. Prof., 30-5-2006 | Web Services, Data structures | 13 years | - |
| 8 | Mrs. E. Jyothikiranmayi | M. Tech., (PhD), JNTU, 2004 | Assoc. Prof., 08-6-2009 | Wireless Sensor Networks | 10 years | - |
| 9 | Mr. S. Anupkant | M. Tech, JNTU, 2010 | Asst. Prof., 27-10-2004 | Embedded Systems | 10 years | - |
| 10 | Mr. A. Seetharam Nagesh | M. Tech, JNTU, 2010 | Asst. Prof., 26-6-2006 | Cloud computing | 13 years | - |
| 11 | Mrs. G. Bhagyasri | M. Tech, OU, 2013 | Asst. Prof., 02-6-2008 | Web Services, Data structures | 9 years | - |
| 12 | Mr. Vamsi Vijaya Krishna | M. Tech, JNTU, 2013 | Asst. Prof., 04-6-2008 | OOPS, Design patterns | 7 years | - |
| 13 | Mrs. S. Rajitha | M. Tech, JNTU, 2013 | Asst. Prof., 12-6-2008 | Web usage Mining | 9 years | - |
| 14 | Mrs. G. Sunitha Rekha | M. Tech, JNTU, 2011 | Asst. Prof., 01-6-2010 | Data Mining | 8 years | - |
| 15 | Mrs. A. Sri Chandana | MS, JNTU, 2007 | Asst. Prof., 01-6-2010 | DBMS | 4 years | - |

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|----|-----------------------|------------------------------------|--------------------------|-----------------------------------|---------------------------------|---|
| 16 | Mr. K. V. Sri Harsha | M. Tech, AU, 2006 | Asst. Prof., 08-6-2010 | Computer Vision | 5 years | - |
| 17 | Mr. Bhanu Mahesh | M. Tech, JNTU, 2010 | Asst. Prof. 14-6-2010 | Cloud Computing and Data Mining | 10 years | - |
| 18 | Mrs. B. Babitha | M. Tech, OU, 2010 | Asst. Prof., 06-7-2010 | Data Mining | 5 years | - |
| 19 | Mr. Nayani Sateesh | M. Tech, M. Phil (PhD), 2010, JNTU | Asst. Prof., 01-6-2011 | Web technologies | 3yearsIndustry, 3 yearsTeaching | - |
| 20 | Mrs. S. Jyothsna | M. Tech, JNTU, 2010 | Asst. Prof. , 01-07-2011 | Cloud computing | 10 years | - |
| 21 | Mrs. N. Pavani | M. Tech, JNTU, 2013 | Asst. Prof., 29-06-2006 | Design patterns | 9 years | - |
| 22 | Mr. M. Srinivas | M. Tech, UOM, 2013 | Asst. Prof., 10-7-2013 | Soft computing | 7 years | - |
| 23 | Mrs. Priyanka Gupta | M. Tech, JNTU, 2014 | Asst. Prof., 24-01-2014 | Image Processing | 1 year | - |
| 24 | Mrs. D.Mamatha Rani | M. Tech, JNTU, 2011 | Asst. Prof., 02-06-2014 | Cloud Computing, Mobile computing | 8 years | - |
| 25 | Mr. P. Seravana Kumar | M. Tech, JNTU, 2011(Ph. D) | Asst. Prof., 02-08-2014 | Bio Data Mining | 7 years | - |

Explanatory Note on PEO's and PO's

Program Educational Objectives are broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve.

PEO 1

Graduates will acquire capability to apply their knowledge and skills to solve various kinds of computational engineering problems.

PEO 2

Graduates will be in a position to recognize and incorporate societal needs and practice their profession with high regard to legal and ethical practices.

PEO 3

Graduates will be ready to work in projects related to complex problems involving multi disciplinary areas.

PEO 4

To evolve as resourceful engineers catering to global changes and engage in life-long learning.

PEO 5

To enable the students with required soft skills, that can be used in a pragmatic manner and excel in diverse environments in the competitive world.

Program Outcomes: POs describe what students are expected to know or be able to do by the time of Graduation from the programme. The programme outcomes of UG in Information Technology are:

- PO 1:** Capability to design the computer software and hardware with the acquired knowledge of mathematics, probability & statistics, graph theory and logic.
- PO 2:** Ability to analyze ,formulate and model problems using concepts of object oriented analysis and design and implement using C#, C++ and Java.
- PO 3:** Ability to appreciate advanced algorithms aimed at organizing, analyzing and interpreting data coupled with computational intelligence.
- PO 4:** Orientation towards research in niche areas like advanced architectures, mobile computing and cloud computing and network security.
- PO 5:** An ability to conduct experiments to investigate complex problems and create models for solution.
- PO 6:** Strong motivation towards creation and use of CASE tools opens source tools and technologies and contribute towards its development.
- PO 7:** Capability to manifest personal and team software process and ability to function across multiple domains.
- PO 8:** An understanding of professional, legal, and ethical issues and responsibilities as it pertains to computer engineering.
- PO 9:** An ability to apply knowledge of local and global changes, analyze its impact on societal, legal and cultural issues related to the practice of computer science and information technology.
- PO 10:** An understanding of the engineering and management principles required for project and finance management and ability to carry out umbrella activities related to project management.
- PO 11:** Ability to communicate technical information in speech, presentation, and, in writing.
- PO 12:** Understanding the necessity and, developing the ability to engage in lifelong learning.

List of Program Outcomes (POs), associated PEOs and Course Outcomes (COs) for Course Subjects offered by Information Technology

II Year I SEM

| Course Name | Course Outcome | PEO | PO |
|--|--|--------------|-------------------------------------|
| Mathematical Foundations of Computer Science | CO 1: Develop new models to represent and interpret the data. | PEO 1 | PO 1 |
| | CO 2: Apply knowledge of mathematics, probability & statistics, graph theory and logic as it applies to the fields of computer software and hardware. | | |
| | CO 3: Interpret statements presented in disjunctive normal form and determine their validity by applying the rules and methods of propositional calculus | | |
| | CO 4: Reformulate statements from common language to formal logic using the rules of propositional and predicate calculus, and assess the validity of arguments. | | |
| Data Structures Through C++ | CO 1: Students should be familiar with C++ structures, pointers and reference parameters and C++ functions. | PEO 1 | PO 1, PO 2, PO 3, PO 4, PO 6 |
| | CO 2: students should be able to describe and explain the concept of an abstract data type and also the applications of ADT's including arrays, stacks, queues, linked lists, trees and files. | | |

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| | CO 3:Students should be able to design , implement and use advanced ADT's | | |
| Unix and Shell Programming | CO 1: Understand the basics of UNIX System environment such as file system, process management etc. | PEO 1 | PO 1, PO 2 |
| | CO 2: Understand the usage of various commands of the UNIX environment, including advanced UNIX commands and utilities. | | |
| | CO 3:Recognize different types of file supported by UNIX operating system | | |
| | CO 4: Implement small automation scripts using constructs of Kshell, Bourne shell, C-shell and their scripts. | | |
| Electronic Devices and Circuits | CO 1: Students should be able to develop and employ circuit models for elementary electronic components like resistors, capacitors, diodes and transistors. | PEO 3 | PO 3, PO 5, PO 6 |
| | CO 2: student would be able to brake test on DC shunt motor and determine performance characteristics | | |
| | CO 3:students should be able to verify the characteristics of P-N junction diode, zener diode, transistor CE,CB and CC | | |
| | CO 4: students should be able to verify the operations of different rectifiers with and without filters. | | |
| Environmental Studies | CO 1:At the end of the course students develop awareness about the hazards to environment | PEO 3, PEO 4 | PO 8, PO 9, PO 11 |
| | CO2:They will develop awareness about optimum utilization of natural resources | | |
| | CO 3:They will learn about GREEN TECHNOLOGIES to maintain sustainable development | | |
| | CO4:They get awareness about rules and regulations applicable for pollution control | | |
| Digital Logic Design | CO 1: Students should be able to solve basic binary math operations using the logic gates and realize logic gates. | PEO 1 | PO 1, PO 2, PO 3, PO 4, PO 5, PO 6 |
| | CO 2: Students should be able to demonstrate programming proficiency using the various logical elements to design practically motivated logical units. | | |
| | CO 3: Students should be able to design different sub systems of ALU unit that are basic building blocks of typical computer's CPU. | | |
| | CO 4:students would be able to learn reduction of state and flow table | | |
| Unix Programming Lab / Data Structures Through C++ Lab | CO 1:Implementation Stack ADT, Queue ADT using arrays and linked lists in | PEO 1 | PO 2, PO 3, PO 4, PO 6 |
| | CO 2:implement Binary search tree operations | | |
| | CO 3:Implement functions of dictionary ADT using hashing | | |
| | CO 4:implement Knuth-Morris-Pratt Pattern matching algorithm | | |
| | CO 5:exercise on utility commands and simple filters, grep filters, awk and awk scripting | | |
| | CO 6:write shell scripting I & II | | |

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| Electrical and Electronics Engineering Lab | CO 1: Students should be able to develop and employ circuit models for elementary electronic components like resistors, capacitors, diodes and transistors. | PEO 3 | PO 3, PO 5 |
| | CO 2: student would be able to brake test on DC shunt motor and determine performance characteristics | | |
| | CO 3:students should be able to verify the characteristics of P-N junction diode, zener diode, transistor CE,CB and CC | | |
| | CO 4: students should be able to verify the operations of different rectifiers with and without filters. | | |
| Verbal Ability Lab | CO 1:At the end of the course it inculcates reading habit to improve concentration skills | PEO 5 | PO 8, PO 10, PO 11 |
| | CO2:It sharpens comprehension skills and enables to analyze the described situation | | |
| | CO 3:Helps students develop writing skills through activities like essay writing and letter writing | | |
| | CO 4: Will become proficient in grammar rules and vocabulary in English | | |

II Year II SEM

| Course Name | Course Outcome | PEO | PO |
|----------------------------|---|--------------|---|
| Probability and Statistics | CO 1:At the end of the course a student acquires the ability to represent the engineering problem as an appropriate statistical model | PEO 1 | PO 1, PO 2 |
| | CO 2: He will get the ability to collect and analyze the data in an engineering problem using different statistical methods | | |
| | CO 3:He gets the ability to draw conclusions after analyzing the data and implementing them in the engineering problem | | |
| Computer Organization | CO 1: Students should be able to master the binary and hexadecimal number systems including computer arithmetic | PEO 1 | PO 1, PO 2, PO 3, PO 4, PO 5, PO 6 |
| | CO 2: Students should be familiar with the functional units of the processor such as register file and arithmetic – logical unit, pipelining, memory hierarchy, instruction execution timing, bus operation | | |
| | CO 3: Students should be familiar with the basics of the system topics: single – cycle (MIPS), multi cycle (MIPS), parallel, pipelined, superscalar and RISC/CISC architectures | | |
| | CO 4: Students should be familiar with assembly language programming, including addressing modes and instruction formats. | | |
| Data Base Management | CO 1: Perform conceptual modeling and logical design of centralized databases. | PEO 1 | PO 3, PO 6 |

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| Systems | CO 2: Implement the relational database logical design using normalization procedure and data modeling using entityrelationship (ER) model. Demonstrate the use of constraints and relational algebra operations. | | |
| | CO 3: Demonstrate Data Manipulation operations using Structured query language and also using stored procedures, sequences and triggers. | | |
| | CO 4: Discuss the database transaction processing and concurrency control. Learn backup and recovery techniques | | |
| Object Oriented Programming through java | CO 1: Demonstrate and Develop the programming constructs offered by Java language and strong object oriented principles. | PEO 1 | PO 1, PO 2, PO 3, PO 4, PO 6 |
| | CO 2: Develop AWT and Swing based applications. | | |
| | CO 3: Realize the power of Exception Handling and Multithreading Concepts. | | |
| | CO4:Realize the power of generics and Collections Framework and Java.io package | | |
| Operating Systems | CO 1: Students after studying this course will have clear knowledge on overview of computer operating systems, protection and security, distributes systems and operating systems structures | PEO 1 | PO 1, PO 2 |
| | CO 2: Students would be able to understand process management, concurrency issues and principles of deadlock. | | |
| | CO 3: students would be able to learn case studies on UNIX, Linux and windows | | |
| | CO 4: Students would be able to learn memory management ,mass storage structure and I/O systems | | |
| | CO 5: Students would be able to learn File system Interface, implementation, protection and security issues in operating systems | | |
| Data Communication | CO 1: Students should be able to solve basic binary math operations using the logic gates and realize logic gates. | PEO 1, | PO 1, PO 2, |
| Systems | CO 2: Students should be able to demonstrate programming proficiency using the various logical elements to design practically motivated logical units. | PEO 3 | PO 3, PO 4, PO 5, PO 6 |
| | CO 3: Students should be able to design different sub systems of ALU unit that are basic building blocks of typical computer's CPU. | | |
| | CO 4:students would be able to learn reduction of state and flow table | | |
| Object Oriented Programming Lab | CO 1:Implementation Stack ADT, Queue ADT using arrays and linked lists | PEO 1 | PO 3, PO 4, PO 6 |
| | CO 2:implement Binary search tree operations | | |
| | CO 3:Implement functions of dictionary ADT using hashing | | |
| | CO 4:implement Knuth-Morris-Pratt Pattern matching algorithm | | |
| | CO 5:exercise on utility commands and simple filters, grep filters, awk and awk scripting | | |
| | CO 6:write shell scripting I & II | | |

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| Database Management Systems Lab | CO 1: Students should be able to develop and employ circuit models for elementary electronic components like resistors, capacitors, diodes and transistors. | PEO 1 | PO 3, PO 6 |
| | CO 2: student would be able to brake test on DC shunt motor and determine performance characteristics | | |
| | CO 3:students should be able to verify the characteristics of P-N junction diode, zener diode, transistor CE,CB and CC | | |
| | CO 4: students should be able to verify the operations of different rectifiers with and without filters. | | |
| Reasoning and Logic Lab | CO 1:At the end of the course it inculcates reading habit to improve concentration skills | PEO 1 | PO 3, PO 6 |
| | CO 2:It sharpens comprehension skills and enables to analyze the described situation | | |
| | CO 3:Helps students develop writing skills through activities like essay writing and letter writing | | |
| | CO 4: Will become proficient in grammar rules and vocabulary in English | | |

III Year I SEM

| Course Name | Course Outcome | PEO | PO |
|-------------------------------------|--|-----------------------------------|-------------------------------------|
| Software Engineering | CO 1: Students after studying this course will have clear understanding of the basic concepts and principles of software engineering. | PEO 1, PEO 2, PEO 3, PEO 4 | PO 1, PO 2, PO 6, PO 7, PO 8 |
| | CO 2: Students would be able to understand the SE process models and the techniques used in different activities of the process models | | |
| | CO 3: Students would be able to develop software using software engineering principles and process model. | | |
| | CO 4: Students would be able to test and debug the software. | | |
| Principles of Programming Languages | CO 1: Understand the salient features of various programming paradigms such as: Functional, logical, Object oriented etc. | PEO 1, PEO 2 | PO 1, PO 2, PO 3, PO 4, PO 6 |
| | CO 2: Briefly understand the specification of syntax and semantics of a programming language, stacks, queues, linked lists, trees and | | |
| | files. | | |
| | CO 3: understand concept of subprograms and blocks. | | |
| | CO 4: Comprehend and analyses the techniques required for writing language translators and Evaluate qualitatively language concepts such as: Types, bindings, concurrency, abstractions, exceptions, and packages. | | |

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| Computer Graphics | CO 1: Students would be able to know the application areas of computer graphics, overview of graphics systems and output primitives. | PEO 1 | PO 1, PO 2, PO 3, PO 6 |
| | CO 2 Students would be able to learn 2D geometric transforms,2D viewing,3D object representation,3D geometric transformations | | |
| | CO 3 Students would be able to learn visible surface detection methods and computer animation | | |
| Design and Analysis of Algorithms | CO 1:Understand asymptotic notations to analyze the performance of algorithms | PEO 1 | PO 1, PO 2, PO 3, PO 6 |
| | CO 2: Identify the differences in design techniques and apply to solve optimization problems. | | |
| | CO 3: Apply algorithms for performing operations on graphs and trees. | | |
| | CO 4:To apply algorithm design paradigms for complex problems and solve novel problems, by choosing the appropriate algorithm design technique for their solution and justify their selection | | |
| Managerial Economics and Financial Analysis | CO 1:At the end of the course the students would be able to think like professional economists and understand economic issues concerning business | PEO 1, PEO 2, PEO 4 | PO 10 |
| | CO 2:Would be able to solve business problems with the help of quantitative analysis | | |
| | CO 3:Gain knowledge on terms like demand analysis and forecasting, production& cost, market structures and pricing decisions | | |
| | CO 4: Would gain knowledge of financial accounting and analysis | | |
| Micro Processors & Micro Controllers | CO 1: Identify the basic elements and functions of microprocessor and Microcontrollers | PEO 1, PEO 3 | PO 1, PO 2, PO 3, PO4, PO 5, PO 6 |
| | CO 2: Describe the architecture of microprocessor, assembly language programming | | |
| | CO 3: Demonstrate fundamentals of understanding the operation between microprocessor and its interfacing devices, interfacing microprocessor with devices like Keya boards, LCD, switches, Seven Segment etc | | |
| | CO 4: Describe the architecture and memory organization of 8051 microcontroller and AVR1. | | |
| Advanced English Communication & Soft Skills lab | CO 1: students evolve as effective communicators and emerge as good decision makers and managers. | PEO 1, PEO 2, PEO 4, PEO 5 | PO 8, PO 9, PO 11 |
| | CO 2: Student develops holistic soft skills and develops right critical and analytical skills. | | |
| | CO 3: Students are enabled to present their skills confidently and face interviews to capture the right job. | | |
| | CO 4: Students are trained to develop leadership qualities and team building skills and organize the ideas and information relevantly and coherently. | | |
| Micro Processors & | CO 1: student should be familiar with the instruction set and addressing modes of 8086 microprocessor. | PEO 1, | PO 1, PO 2, |

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| Micro Controllers Lab | CO 2: students should be able to develop an algorithm and write an assembly language program using 8086 instruction set | PEO 3 | PO 3, PO 4, PO 5, PO 6 |
| | CO 3: students should be able to interface with various I/O devices such as ADC, DAC, LED's serial interfaces and operation. | | |
| | CO 4: students should be able to apply the programming techniques in developing the assembly language program for microprocessor application | | |
| Data Interpretation Lab | At the end of the course | PEO 1, PEO 2, PEO 3, PEO 4 | – |
| | CO 1: student should be able to represent the d in tabular form, Line Graph, Bar chart, Pie Chart, X-Y Charts. | | |
| | CO 2: Students would be able to solve the problems with the given data | | |
| | CO 3: students would be able to solve puzzles and logical questions | | |

III Year II SEM

| Course Name | Course Outcome | PEO | PO |
|---|--|-------------------------|---|
| Web Technologies | CO 1: Ability to develop basic web sites with some dynamic content | PEO 1, PEO 2 | PO 1, PO 2, PO 3, PO 4, PO 6 |
| | CO 2: Ability to develop database connectivity programs in order to develop client server based applications | | |
| | CO 3: Ability to develop Client Server Applications wing MVC Architecture with the support of servlets, JSP and Beans etc. | | |
| | CO 4: Students would be able to test and debug the software. | | |
| Embedded Systems Design | CO 1: composition, design and implementation of embedded systems | PEO 1, PEO 3 | PO 1, PO 2, PO 3, PO 4, PO 5, PO 6 |
| | CO 2: high level languages like C, Python and low level languages like assembly language for embedded system development techniques, in particular embedded programming in c | | |
| | CO 3: embedded processor architecture, memory organization and instruction set architecture, saving power and memory and RTOS related embedded applications. | | |
| | CO 4: Embedded system realization including interfacing the required devices such as LCD, Keyboard, DAC/ADC, Switches, LED, Seven segment display and serial communication protocols and operation | | |
| ELECTIVE – I: Computer Forensics / WNMC / IPPR | | | |
| Computer Forensics | CO 1: Students would be able to implement the computer forensics methodology and steps taken by computer forensic scientist. | PEO 1 | PO 1, PO 2, PO 4 |

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| | <p>CO 2: Students would be able to recover the data deleted by the criminals and take back up.</p> <p>CO 3: Students would be able to collect the evidence by following data seizure methods.</p> <p>CO 4: Students would be able to follow standard procedures for network forensics and develop various network forensic tools.</p> <p>CO 5: Students would be able to help law enforcement agencies in their investigations of digital related crimes.</p> | | |
| Wireless Networks and Mobile Computing | <p>CO 1: Apply advanced data communication methods and networking protocols for wireless and mobile environment.</p> <p>CO 2: Utilize and employ application frame works for developing mobile applications including under disconnected and weakly connected environment.</p> <p>CO 3: Select components and networks for particular application.</p> <p>CO 4: Understands issues related to client server computing with adaptation, power-aware and context aware computing.</p> <p>CO 5: Understands the properties of MANET and MANET protocols.</p> | PEO 1 | PO 1, PO 2, PO 4 |
| Image Processing and Pattern Recognition | <p>CO 1: to acquire the fundamental concepts of a digital image processing system</p> <p>CO 2: learn Image enhancement in spatial domain, Image restoration, and Image compression and segmentation techniques.</p> <p>CO 3: learn color image processing, morphological image processing</p> <p>CO 4: learn object recognition based on statistical classifiers, neural networks, and matching, theoretical and structural methods.</p> | PEO 1 | PO 1, PO 2, PO 4 |
| Automata and Compiler Design | <p>CO 1: Thoroughly understand formal language principles, employ finite state machines to solve problems in computing and classify machines by their power to recognize languages analyzes the techniques</p> <p>CO 2: Comprehend and analysis the techniques required for writing language translators.</p> <p>CO 3: Basic knowledge about different structures & design features of complementary Compiler design.</p> <p>CO 4: Work comfortably with C, C++ compilers. Use tools like LEX & YACC to design primitive compilers.</p> | PEO 1, PEO 3 | PO 1, PO 2, PO 3, PO 4, PO 5, PO 6 |
| Linux Programming | <p>CO 1: Write correct and well documented advanced C code using low level Unix/Linux system calls that is demonstrated to execute correctly</p> <p>CO 2: Know where to look for platform specific programming information and be familiar with reading and using man page information as well as other standard reference materials</p> | PEO 1, PEO 2 | PO 1, PO 2, PO 3, PO 4, PO 6 |

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| | CO 3: Clearly and accurately explain design decisions in written program documentation | | |
| | CO 4: Be able to design and implement simple, but efficient, concurrent process and thread based application using IPC and ITC. | | |
| Computer Networks | CO 1: Students will be able to visualize the seven layers of computer network with the different kind of network. | PEO 1, PEO 2 | PO 1, PO 4, PO 6, PO 8, PO 9, PO 12 |
| | CO 2: Students will be able to understand the mapping of addressing and routing protocols. | | |
| | CO 3: Students will be able to apply QOS parameters and evaluate the performance. | | |
| | CO 4: Students will be able to develop new application with the underlying protocols of application layer. | | |
| Web Technologies & Linux Programming Lab | CO 1: Realize basic system calls and library functions on file operations. | PEO 1, PEO 3, | PO 1, PO 2, PO 3, PO 4, |
| | CO 2: Design and implement concurrent programs using threads and process with different IPC mechanisms. | | |
| | CO 3: Ability to develop basic web sites with some dynamic content and data base connectivity programs in order to develop client server based applications | PEO 4 | PO 6 |
| Embedded Systems & Computer Networks Lab | CO 1: Student should be familiar with the instruction set and addressing modes of 8051 embedded microprocessor. Network Layer. | PEO 1, PEO 3, PEO 4 | PO 1, PO 2, PO 3, PO 4, PO 5, PO 6 |
| | CO 2: students should be able to develop an algorithm and write an assembly language program using 8051 instruction set | | |
| | CO 3: students should be able to interface with various i/o devices such as ADC, DAC, LCD, switches serial interfaces and operation. | | |
| | CO 4: The students will be able to implement the framing concepts in Data link Layer. | | |
| | CO 5: They will be able to implement the CRC check. | | |
| | CO 6: They will be able to implement algorithms like Dijkstra's, Distance Vector at Network Layer. | | |
| Quantitative Ability Lab | CO 1: Like Data Interpretation this course helps the students to take the competitive examinations better equipped | PEO 1, PEO 3, PEO 4 | — |
| | CO 2: This would help the students to master different quantitative methods | | |

IV Year I SEM

| Course Name | Course Outcome | PEO | PO |
|-------------|--|---------------|--------------------|
| Software | CO 1: Students after studying this course will have clear knowledge on the basic concepts and principles of testing. | PEO 1, | PO 1, PO 2, |

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| Testing Methodologies | CO 2: Students would gain knowledge on different types of bugs, testing strategies and techniques to find the bugs. | PEO 2, PEO 3, PEO 4 | PO 6, PO7, PO 8, PO 1 |
| | CO 3: Students would be able to design the test cases using white box and black box testing techniques. | | |
| | CO 4: Students would be able to test the software at different levels (Unit, Integration, Functional) to find the bugs | | |
| Object Oriented Analysis and Design | CO 1: Students after studying this course will have clear knowledge on the basic concepts of object oriented analysis and design. | PEO 1, PEO 2 | PO 1, PO 2, PO 3, PO 4, PO 6 |
| | CO 2: Students would be able to understand the basic building blocks and conceptual model of UML. | | |
| | CO 3: Students would be able to gain knowledge on different UML models, their design and purpose. | | |
| | CO 4: Students would be able to create required models (design) for a problem, which forms the basis for coding. | | |
| | CO 5: Students would be able to generate skeleton code by forward engineering the model. | | |
| Mobile Application Development Using Android | CO 1:At the end of course student should be able to | PEO 1, PEO 2 | PO 1,PO 2, PO 3, PO 4, PO 6 |
| | CO 2: identify current trends in mobile communications technologies and systems. | | |
| | CO 3:Select and evaluate suitable software tools and APIs for the development of a particular mobile application | | |
| | CO 4: Use an appropriate application development to design, write and test small interactive programs for mobile devices. | | |
| Network Security | CO 1: Students will be able to understand the theory of fundamental cryptography, encryption and decryption algorithm. | PEO 1, PEO 2, PEO 3, PEO 4 | PO 1, PO 4, PO 6, PO 8, PO 9, PO 12, |
| | CO 2: Students will be able to Build a secure authentication system | | |
| | CO 3: Students will be able to Understand the key management principles and implement the digital signature | | |
| | CO 4: Students will be able to develop the secured IP and the secured Web for electronic transactions | | |
| INTERDISCIPLINARY ELECTIVE | | | |
| Principles of VLSI Design | CO 1: learn IC technologies. | PEO 1, PEO 3 | PO 1,PO 4,PO6 |
| | CO 2: learn VLSI circuit design process. | | |
| | CO 3: Gate level Design ,data path subsystems, array sub systems | | |
| | CO 4:learn IC Design Methodologies and CMOS testing | | |
| Operations Research | CO 1:At the end of the course a student would develop skills to represent an engineering problem as an appropriate operations research model | PEO 1, PEO 3 | PO 1, PO 4, PO 6 |

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| | CO 2: He will get the ability to collect and analyze the data in an engineering problem using different operations research methods | | |
| | CO 3:He gets the ability to draw conclusions after analyzing the data and implementing them in the engineering problem | | |
| Elements of Civil and Mechanical Engineering | CO 1: understand the role of civil engineer in infrastructure development and its effect on socio economic development of a country. | PEO 1, PEO 3 | PO 1, PO 4, PO 6 |
| | CO 2:understand the elements of building construction ,measurements and estimation of quantities, estimation and costing | | |
| | CO 3: understand the systems of forces in engineering mechanics. | | |
| | CO 4:understand mechanism of solids, concept of manufacturing, thermodynamics and internal | | |
| ELECTIVE – II : HCI / DMBA / Scripting Languages | | | |
| Human Computer Interaction | CO 1: Students should be able to learn The basic concepts and principles designing user interface. | PEO 1 | PO 1, PO 2, PO 3, PO 6 |
| | CO 2: Students should be able to learn Process models of designing windows and components. | | |
| | CO 3: Students would be able to know the usage of image and video display-drivers. | | |
| DataMining and Business Analytics | CO 1: student would be able to acquire knowledge on data mining fundamentals and integration of data mining system with a database or data warehouse system | PEO 1 | PO 1, PO 2, PO 3, PO 6 |
| | CO 2: Student would be able to understand the data preprocessing | | |
| | CO 3: students would be able to understand the data warehouse and OLAP technology for data mining | | |
| | CO 4: Student would be acquiring knowledge on mining frequency patterns, associations and correlations, classification and prediction, cluster analysis. | | |
| | CO 5: Student would be able to acquire knowledge on mining time series, sequence data and graphs, object spatial, multimedia, text and web. | | |
| Scripting Languages | CO 1:Exposure towards various scripting languages | PEO 1 | PO 1, PO 2, PO 3, PO 6 |
| | CO 2:Ability to develop Client side and Server side data validations | | |
| | CO 3:Ability to develop Distributed web based applications. | | |
| Software Testing & CASE Tools Lab | CO 1: Student learn testing tools like Winrunner, JUnit to test a software GUI based application. | PEO 1, PEO 2, PEO 3, PEO 4 | PO 1, PO 2, PO 6, PO 7, PO 8, PO 10 |
| | CO 2: They learn to use Test Director to manage the test cases developed. | | |
| | CO 3: They learn to analyze the requirements of systems like ATM, Library and design various models. | | |
| | CO 4: They learn the usage of nine UML diagrams in designing the systems in different levels of abstraction. | | |

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| Mobile Application Development Using Android Lab | CO 1: understand the technical challenges posed by current mobile devices and wireless communications; be able to evaluate and select appropriate solutions. | PEO 1, PEO 2 | PO 1, PO 2, PO 3, PO 4, PO 6 |
| | CO 2: Appreciate the need to keep up with rapid changes and new developments; be able to identify current trends in mobile communications technologies and systems. | | |
| | CO 3: Select and evaluate suitable software tools and APIs for the development of a particular mobile application and understand their strengths, scope and limitations. | | |
| | CO 4: Use an appropriate application development to design, write and test small interactive programs for mobile devices. | | |
| Industry Oriented Mini Project | CO 1: The graduate will be able to write the requirement specification of small real life problem. | PEO 1, PEO 2, PEO 3, PEO 4, PEO 5 | PO 1, PO 6, PO 7, PO 8, PO 10, PO 11, PO 12 |
| | CO 2: The graduate will be able to collect the ideas through literature survey about new innovations, analyze and interpret into new solutions. | | |
| | CO 3: The graduates will be able to make themselves aware of knowledge in industry perspective and new industry trends. | | |
| | CO 4: The graduate will be able to document their findings and present it to the selected audience. | | |

IV Year II SEM

| Course Name | Course Outcome | PEO | PO |
|--|---|--------------|-----------------|
| Management Science | CO 1: Identify and describe the theories of management and organizational behavior covered in class. | PEO2 | PO10 |
| | CO 2: Applying knowledge in extra-organizational issues and contemporary management practices. | | |
| | CO 3: Management Science equips students to develop and understand different models and solutions to the managerial problems. | | |
| | CO 4: These models help in understanding managerial issues and in generating tools for solving problems of management & control | | |
| ELECTIVE – III: Web Services / e-Commerce / Cloud Computing | | | |
| Web Services | CO 1: Understand the use of Web Services in Business to Consumer (B2C) and Business to | PEO 1 | PO1,PO2, |
| | CO 2: Understand the design principles and applications of SOAP based Web Services. | | PO4 |
| | CO 3: Design, Implement and Deploy Web Services. | | |

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| | CO 4:Employ the publish, find, bind architecture for Web services and to use the corresponding standards, in particular, Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP), and Universal Description, Discovery and Integration (UDDI). | | |
| | CO 5: acquire knowledge on web services interoperability and service composition. | | |
| e-Commerce | CO 1: understand the basic concepts of e-commerce and their different elements. | PEO 1 | PO 1,PO 2, PO 4 |
| | CO 2: summarize the main reasons for adoption of e-commerce and e-business and barriers that may restrict adoption. | | |
| | CO 3: use resources to define the extent of adoption of the internet as a communications medium for consumers and businesses. | | |
| | CO 4: Outline the business challenges of introducing e-business and e-commerce to an organization. | | |
| Cloud Computing | CO 1:learn about web services delivered from cloud | PEO 1 | PO 1,PO 2, PO 4 |
| | CO 2:learn about federation presence, identity and privacy in the cloud, common standards in cloud computing | | |
| | CO 3: know about end user access to cloud computing and also mobile platform virtualization. | | |
| | CO 4: learn cloud computing case studies like Amazon S3, Amazon cloud front and Amazon SQS, Google App Engine, Microsoft Dynamic CRM. | | |
| ELECTIVE – IV: ASN / MWT / DP | | | |
| Ad hoc and Sensor Networks | CO 1: Students would be able to develop their own ad hoc network by understanding the basic concepts of Ad hoc networks and Wireless sensor networks. | PEO 1 | PO 1,PO 4, PO 7 |
| | CO 2: Students would be able to implement the concepts of basic tools used for simulation in Ad hoc And sensor network. | | |
| | CO 3:Students would be able to use the simulation like ns2,TOSSIM | | |
| | CO 4: Students would be able to familiar with different routing algorithms in Ad hoc and Sensor networks. | | |
| Middleware Technologies | CO 1:Know client server computing models and can establish communication between the | PEO 1 | PO 1,PO 4, PO 7 |
| | CO 2:Design a dynamic remote application with RMI and JDBC Connectivity | | |
| | CO 3:Develop programming using C#.net | | |
| | CO 4: Differentiate homogeneous and heterogeneous language communications. | | |
| | CO 5:Develop real time projects by combining CORBA and database interfacing | | |
| Design Patterns | CO 1: Student should be able to know the basic concepts of Design patterns. | PEO 1 | PO 1,PO 4, |

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| | CO 2: Student should be able to know the identification of Design pattern in the existing code. | | PO 7 |
| | CO 3: Student should be able to know how to use the design pattern. | | |
| | CO 4: Student should be able to know how to select the design pattern | | |
| Seminar | CO 1: The graduate will be able to present on the design and fabrication of imparted knowledge in different aspects of a domain. | PEO 1, PEO 2, PEO 3, PEO 4, PEO 5 | PO 1,PO 6, PO 7,PO 8, PO 10, PO 11, PO 12 |
| | CO 2: The graduate will be able to present to the audience on the methods of solving. | | |
| | CO 3: The graduate will be able to develop presentation skills, Build confidence and improve communication skills. | | |
| | CO 4: Sharpen their personality, intelligence and make themselves aware of knowledge about new hardware and software needs of market. | | |
| Comprehensive Viva | CO 1: The graduate shall be able to communicate the technical aspects of the subjects that they have studied past four years. | PEO 1, PEO 2, PEO 3, PEO 4, PEO 5 | PO 1,PO 6, PO 7,PO 8, PO 10, PO 11, PO 12 |
| | CO 2: The graduate will be able to express his depth of knowledge by understanding the current problems and/or new insights at the forefront of those subjects. | | |
| | CO 3: The graduate will be able to convince the command on the subject systematically. | | |
| Project Work | CO 1: The graduate will be able to explain the aim, objective, and utility of the complex problem to selected audience. | PEO 1, PEO 2, PEO 3, PEO 4, PEO 5 | PO 1 ,PO 6, PO 7,PO 8, PO 10, PO 11, PO 12 |
| | CO 2: The graduate will be able to develop software Project management skills, Problem solving skills and System integration skills | | |
| | CO 3: The graduate will be able to work in a team to solve real-life problems and maintain professionalism. | | |

Performance of Students

| S. No. | Year of Passing | No. of Students appeared | No. of students passed | Pass Percentage | No. of Students placed | No. of Students went for higher studies |
|---------------|------------------------|---------------------------------|-------------------------------|------------------------|-------------------------------|--|
| 1 | 2010-11 | 75 | 70 | 93% | 60 | 8 |

| | | | | | | |
|----------|----------------|------------|------------|--------------|-----------|-----------|
| 2 | 2011-12 | 122 | 102 | 83.6% | 71 | 13 |
| 3 | 2012-13 | 117 | 105 | 89.7% | 43 | 36 |
| 4 | 2013-14 | 112 | 104 | 92.8% | 47 | 42 |
| 5 | 2014-15 | 113 | | | 65 | 35 |