



Department of Computer Science & Engineering

Course outcomes

Course Name: Applied Mathematics

Class: Third Semester BE

Course Code: BECSE201T

CBS-2015

CO1-Apply the fundamental concepts of integral transform and matrices to solve differential equations.

CO2-Compute singularities and also the residues and use Cauchy's integral formula and residue theorem to solve contour integral.

CO3-Understand the concept of probability theory and to derive the mean and variance.

CO4-Analyze and solve engineering problems using Fourier series.

Course Name: Advance "C" & Programming Logic Design

Class: Third Semester BE

Course Code: BECSE202T

CBS-2015

CO1- Understand the basic concept of Array, structure, string and pointer

CO2- Implement the program using arrays, string and pointer

CO3- Understand the concept of file handling function and implement the program

CO4- Create and demonstrate the graphics function

CO5- Problem solving and programming

CO6- Understand computational model and object oriented concept

Course Name: Digital Circuits & Fund. Of Microprocessor

Class: Third Semester BE

Course Code: BECSE203T

CBS-2015

CO1- Understand the different number systems and basic knowledge of logic gates and optimization of Boolean expression.

CO2- Design combinational and sequential circuits using gates.

CO3-Analyses the Combinational building blocks & Memory elements.

CO4-Apply flip-flops for various applications

CO5-Understand basics of 8085 microprocessor

CO6-Implement programs of 8085 microprocessor

Course Name: Ethics in IT

Class: Third Semester BE

Course Code: BECSE204T

CBS-2015

CO1- To extend the state of art in some of the areas of interest and create new knowledge.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



CO2- To communicate effectively in oral, written and graphical form.

CO3- To work cooperatively, responsibly, creatively, and respectfully in teams.

CO4- To understand professional and ethical responsibilities and analyze the impact of computing on individuals, organizations, and the society.

CO5- To identify and analyze an ethical issue in the subject matter under investigation or in a relevant field.

CO6- To assess their own ethical values and the social context of problems.

Course Name: Computer Architecture and organization

Class: Third Semester BE

Course Code: BECSE205T

CBS-2015

CO1- To introduce and understand basic concepts of computers, architecture, bus structure, instruction format.

CO2- To introduce and understand computer arithmetic circuits, their implementation, techniques and different algorithm to perform arithmetic and logical operations

CO3- To introduce, understand and implement techniques for computer memory system, different memory hierarchy, different memory related algorithms.

CO4- To introduce and understand I/O system organisation, interrupts, data transfer and computer peripherals.

CO5- To introduce and understand RISC philosophy, pipelining techniques and performance consideration.

CO6- To introduce and understand multi core architecture, parallel processing, vector processing, array processors.

Course Name: Discrete Mathematics & Graph Theory

Class: Fourth Semester BE

Course Code: BECSE208T

CBS-2015

CO1-Students completing this course will be able to express a logic sentence in terms of predicates, quantifiers, and logical connectives.

CO2-Students completing this course will be able to apply the rules of inference and methods of proof including direct and indirect proof forms, proof by contradiction, and mathematical induction.

CO3-Students completing this course will be able to understand group theory and ring theory.

CO4-Students completing this course will be able to evaluate Boolean functions and simplify expressions using the properties of Boolean algebra and lattices.

CO5-Students completing this course will be able to use tree and graph algorithms to solve problems.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



CO6-Students completing this course will be able to use permutation, combination and generating function to solve recurrence relation.

Course Name: Data Structures & Program Design

Class: Fourth Semester BE

Course Code: BECSE211T

CBS-2015

CO1-Analyze the running time of any program and learn to implement basic data structures.

CO2-Identify and apply the concept of computational intractability with various data structures.

CO3-Acquire knowledge in representing actual data representation.

CO4-Ability to have knowledge of tree and graphs concepts.

CO5-Understanding the concept of Symbol Tables and its application.

Course Name: Operating System

Class: Fourth Semester BE

Course Code: BECSE211T

CBS-2015

CO1- Analyze the structure of OS and basic architectural components involved in OS design.

CO2- Describe and analyze the memory management and its allocation policies.

CO3- Identify use and evaluate the storage management policies with respect to different storage management technologies.

CO4- Understand the process management policies and scheduling of processes by CPU.

CO5- Analyze and design the applications to run in parallel either using process or thread models of different OS.

CO6- Understand the Mutual exclusion, Deadlock detection of operating system.

Course Name: Theoretical Foundations of Computer Sciences

Class: Fourth Semester BE

Course Code: BE4S4T

CBS-2015

CO1- Understand the basic mathematical preliminaries like alphabet, language and its operation.

CO2- Design the Computational Models using languages and grammar.

CO3- Understand the concept of Chomsky hierarchy and design the normal form.

CO4- Design Turing machine for type 0 grammar.

CO5- Problem solving using post correspondence problem.

CO6- Understand recursive and recursively enumerable language and solve the problem.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



Course Name: System Programming

Class: Fourth Semester BE

Course Code: BE4S5T

CBS-2015

CO1- Organize the functionalities and components of a computer system into different layers, and have a good understanding of the role of system programming and the scope of duties and tasks of a system programmer.

CO2- Grasp the concepts and principles, and be familiar with the approaches and methods of developing system-level software (e.g., compiler, and networking software).

CO3- Apply the knowledge and techniques learnt to develop solutions to real world problems.

CO4- Select and make use of the OS kernel functions and their APIs, standard programming languages, and utility tools.

CO5- Organize and manage software built for deployment and demonstration; Attributes for all-roundedness.

CO6- Analyze requirements and solve problems using systematic planning and development approaches.

**Course Name: Data Communication
Semester BE**

Class: Fifth

Course Code: BECSE301T

CBS-2015

CO1- To introduce and understand basic concepts about basics of data communication, analog and digital signals, transmission modes.

CO2- To understand and implement different signal conversion techniques like line coding, block coding using different analog and digital signalling techniques.

CO3- To introduce and understand different transmission media like guided and unguided, comparative study their construction and working details.

CO4- To introduce and understand the need of multiplexing techniques like FDM, TDM, WDM and spread spectrum, different digital services used in telecommunication.

CO5- To study the basics of different image and video compression techniques like JPEG, MPEG, and comparison of various methods of compression.

CO6- To introduce and understand the techniques of video and image compression techniques in details like Huffman, relative, LZ and study of different WWW protocols like RTP, HTTP.

Course Name: Object Oriented Programming

Class: Fifth Semester BE

Course Code: BECSE302T

CBS-2015

CO1-Students will able to learn the computational and object oriented concept.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietn@raisoni.net Website: http://ghrietn.raisoni.net



CO2-Students will able to develop programs using the basic elements Class & object, Inheritance, Overloading, Overriding etc.

CO3-Students will able to solve the memory access problems by using pointers and dynamic binding.

CO4-Students will able to develop the program on File handling function.

CO5-Students will able to learn problem solving and programming.

Course Name: Data Base Management System

Class: Fifth Semester BE

Course Code: BECSE303T

CBS-2015

CO-1 Understand and model the Database concept using PL/SQL.

CO2- Model relational database using Relational algebra operators.

CO3- Understand and describe the concepts of Indexing, functional dependency and normalization techniques for database designing.

CO4- Understand the concepts of transaction and query processing.

CO5- Understand about how the Database recovery concepts and techniques are used in order to maintain database integrity.

CO6- Develop and programmed a DBMS based application.

Course Name: Computer Graphics

Class: Fifth Semester BE

Course Code: BECSE304T

CBS-2015

CO1- Explain applications, principles, commonly used techniques of computer graphics.

CO2- Define the basic principles of 3-dimensional computer graphics.

CO3- Develop a facility with the relevant mathematics of computer graphics, e.g.2Dand3D rotations using vector algebra, transformations and projections using homogeneous co ordinations.

CO4- Analyze computer graphic algorithms for clippings, and viewing concepts on 2D and 3D.

CO5- Apply C and C++ OpenGL programming in modeling 2D and 3D objects, e.g., hidden line and surface removal, shading, and rendering.

Course Name: Design Analysis of Algorithm

Class: Fifth Semester BE

Course Code: BECSE305T

CBS-2015

CO1- To analyse the performance recurrence relation using mathematical characteristics equations & use of appropriate asymptotic notations to measure the performance.

CO2- To design & implement the network using parallel computing tool.

CO3- Design & analysis the various algorithm using divide and conquer approach.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



CO4- Solve problem & analysis the various algorithm using dynamic programming & greedy technique.

CO5- To solve the Problem using backtracking techniques.

CO6- Identify the computational issues and apply suitable algorithms to solve it effectively.

Course Name: Artificial Integelligence

Class: Sixth Semester BE

Course Code: BECSE306T

CBS-2015

CO1- Understand space search and search algorithms, logic based knowledge representation of issues in reasoning methods

CO2- Select appropriate search paradigms for appropriate problems

CO3- Design and implement a forward chaining knowledge based system including rule base.

CO4- Understand uncertain knowledge and fuzzy logic.

CO5- Use resolution and unification for discovering new facts.

CO6- Describe the types of systems that can be built using expert system techniques, in particular knowledge based systems, rule-based expert systems.

Course Name: Design Pattern

Class:Sixth Semester BE

Course Code: BECSE307T

CBS-2015

CO1- Understand the concept of GoF design patterns on the basis of analysis and design.

CO2- Understand and relate the concepts of Creational, Structural and behavioural design pattern.

CO3- Apply suitable design pattern on solutions of commonly encountered problems.

CO4- Design an application by applying suitable design pattern on the core of the solution.

CO5- To analyse and evaluate the design issues and uses of suitable design pattern on specified case study.

Course Name: Software Engineering and Project Management

Class:Sixth Semester BE

Course Code: BECSE308T

CBS-2015

CO1- Define various software application domains and remember different process model used in software development.

CO2- Explain needs for software specifications also they can classify different types of software Requirements and their gathering techniques.

CO3- Convert the requirements model into the design model and demonstrate use of software and user interface design principles.

CO4- Distinguish among SCM and SQA and can classify different testing strategies and tactics and compare them.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietn@raisoni.net Website: http://ghrietn.raisoni.net



CO5- Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.

CO6- Generate project schedule and can construct, design and develop network diagram for different

Course Name: Computer Networks

Class:Sixth Semester BE

Course Code: BECSE309T

CBS-2015

CO1- Identify to differentiate between OSI and TCP/IP models and identify the responsibility of each layer.

CO2- Understand the concept of data and signal, data transmission and data conversion.

CO3- Describe block coding techniques and different data link layer protocols.

CO4- Understand multiple access techniques and working of Bluetooth, backbone networks.

CO5- Understand the routing concepts and routing algorithm.

CO6- Describe the architecture of cellular telephony and working principle of ATM networks.

Course Name: Functional English

Class:Sixth Semester BE

Course Code: BECSE310T

CBS-2015

CO1-Improve the English grammar having common errors, Transformation of sentences, phrases, Idioms and proverbs.

CO2-Prepare for competitive exam and to improve the skills of Interview Techniques.

CO3-Prepare the students in their writing skill including Business Letters, e-mail etiquettes, enquiries, job applications and Resume writing Meorandum, Circulars, notices.

CO4- Buit-up the Analytical Comprehension skill in students.

CO5- Prepare the students in Technical and scientific writing

CO6- Create awareness regarding IPA(Vowel and consonsonant phonemes), words derived from other languages, and technical jargons.

CO7- Evaluate the students on fictional and non -fictional unseen passages and give them feedback on how to improve their readind and comprehension skills.

CO8- Evaluate their knowledge on Synonyms/ antonmys and give them exercises to improve on those skills.

Course Name: Data Warehousing and mining

Class:Seventh Semester BE

Course Code: BECSE401T

CBS-2015

CO1- Understand the concept of data mining and its applications.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietn@raisoni.net Website: http://ghrietn.raisoni.net



CO2- Analyze various data pre-processing techniques to improve the quality of data and efficiency and the ease of the mining process.

CO3- Understand the concept of data classification methods

CO4- Analyze the various association rule mining methods

CO5- Understand the unsupervised learning techniques and the algorithm used for data clustering

Course Name: Language Processor

Class:Seventh Semester BE

Course Code: BECSE402T

CBS-2015

CO1-Understand different phases and property of Compiler.

CO2-Design and implement a lexical analyzer and a syntax analyzer.

CO3-Specify appropriate translations to generate intermediate code for the given programming language construct.

CO4-Compare and contrast different storage management schemes.

CO5-Identify sources for code optimization & Generation.

Course Name: Elective-I TCP/IP

Class:Seventh Semester BE

Course Code: BECSE403T

CBS-2015

CO1- Internet IPv4 and their extension to IPv6 .

CO2- Differentiate three routing protocols used in the Internet and implement two of them.

CO3- Interpret and exemplify multicast routing

CO4- Classify problems such as reliable transport, data delay, congestion and flow control and describe at least three congestion control schemes used in TCP.

CO5- Interpret the Internet best-effort type of service and its improvements

Course Name: Elective-II Mobile Computing

Class:Seventh Semester BE

Course Code: BECSE404T

CBS-2015

CO1-Understand the history of wireless communication, its applications and advantages over wired network.

CO2-Understand specialized medium access control for wireless network such as SDMA, FDMA, TDMA, CDMA.

CO3-Analyze GSM, its technical requirement, its network structure and protocols.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



CO4-Understand network layer protocols of wireless communication and transport Layer Mechanisms.

CO5- Understand mobile adhoc network, its applications, properties and various routing Algorithms for MANET.

CO6- Understand wireless application protocols, its architecture, working of all protocol layers, Along with Bluetooth, Wireless LAN and J2ME.

Course Name: Distributed Operating System

Class:Eighth Semester BE

Course Code: BECSE406T

CBS-2015

CO1- Design & synchronized various clock in distributed operating system.

CO2- To execute mutual exclusion in token & non-token based algorithm.

CO3- Design & analysis the deadlock detection.

CO4- Design the various file system.

CO5- To schedule the distributed file using tools.

CO6- To identify the failure recovery techniques.

Course Name: Information & Cyber Security

Class:Eighth Semester BE

Course Code: BECSE407T

CBS-2015

CO1- Explain basic concepts and algorithms of cryptography, including encryption/decryption and hash functions.

CO2- Evaluate the role played by various security mechanisms like passwords, access control mechanisms, firewalls etc.

CO3- Explain the workings of fundamental cryptographic, authentication, network security and system security algorithm

CO4- Solve and relate mathematic concepts behind the cryptographic algorithms.

CO5- Explain security issues and objectives in computer systems and networks.

Course Name: Elective III Cloud Computing & Clustering

Class: Eighth Semester BE

Course Code: BECSE408T

CBS-2015

CO1- Understanding the key dimensions of the challenge, benefits of Cloud Computing

CO2- Identify the appropriate cloud services for a given application.

CO3 Understand the challenges, concept in big data and hadoop technology.

CO4- Analyze authentication, confidentiality and privacy issues in cloud computing.

CO5- Identify security implications in cloud computing.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



CO6- Understand the importance of protocols and standards in management for cloud services and creating cloud application using Azure

M-TECH COMPUTER SCIENCE & ENGINEERING

Course Name: High Performance Computer Architecture **Class: First Semester M-Tech =CSE**

Course Code: PGCSE101T **CBCS-2016**

CO1- Understand the theoretical concepts and performance issues for parallel computing.

CO2- Understand the theoretical concepts and performance issues for High Performance Computing systems.

CO3- Understand architectural hardware and software issues for high performance computing Systems.

CO4-.Analyze programming models of parallelism.

CO5- Understand selected parallel algorithms and approaches for computer modelling and Simulations of selected applications.

CO6- Create parallel software.

Course Name: Advances in Operating System Design **Class: First Semester M-Tech CSE**

Course Code: PGCSE102T **CBCS-2016**

CO1- Explain the design & synchronized global memory & clock in distributed operating system.

CO2- To learn the resource management in the distributed system

CO3- To design the multiprocessor system

CO4- To learn the real time operating system.

Course Name: Data Science **Class: First Semester M-Tech CSE**

Course Code: PGCSE103T **CBCS-2016**

CO1-Identify the scope and necessity of Data Mining & Warehousing for the society. Describe the designing of Data Warehousing so that it can be able to solve the root problems.

CO2- To understand various tools of Data Mining and their techniques to solve the real time problems.

CO3- To develop ability to design various algorithms based on data mining tools.

CO4- To develop further interest in research and design of new Data Mining techniques.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: http://ghrietrn.raisoni.net



CO5- To understand the concepts of mathematics (probability, statistics, optimization), computer science (algorithms, data structures, automata, computational complexity), and artificial intelligence (machine learning, knowledge representation, automatic reasoning) on which Data Science relies.

CO6-Understanding the legal and societal implications.

Course Name: AI and Expert System Design (Elective –I) Class: First Semester Mtech CSE

Course Code: PGCSE104/2T CBCS-2016

CO1- Understand the various searching techniques, constraint satisfaction problem and example problems- game playing techniques.

CO2- Apply these techniques in applications which involve perception, reasoning and learning

CO3- Acquire the knowledge of real world Knowledge representation

CO4- Build awareness of AI facing major challenges and the complexity of typical problems within the field.

CO5- Understand the basic concepts of expert system

Course Name: Cyber Forensic and Computer Crimes(Elective-II) Class: First Semester M-Tech CSE

Course Code: PGCSE105/2T CBCS-2016

CO1- Understand the computer Forensics fundamental

CO2- Describes Applications of Cyber Forensic and Computer crimes, its Privacy, Security and Governance

CO3- Describes computer forensic analysis and validation

CO4- Learn current computer forensic tools and working with windows and DOS system

Course Name: Advances in Algorithms Class: Second Semester M-Tech(CSE)

Course Code: PGCSE201T CBCS-2016

CO1- To analyze the complexity of various algorithms

CO2- To design & implement the algorithm using greedy, divide & conquer & dynamic programming.

CO3- To analyze the text processing & number theory in cryptography

Course Name: Advance Computer Network and Security Class:Second Semester M-Tech(CSE)

Course Code: PGCSE202T CBCS-2016

CO1- Understand the history of wireless communication, its applications and advantages over wired network.



G.H. RAISONI INSTITUTE OF ENGINEERING AND TECHNOLOGY, NAGPUR

Affiliated to RTM Nagpur University, Nagpur and NAAC Accredited.
Shradha Park, B-37/39-1, Hingna-Wad Link Road, Nagpur-440016, Phone Nos.:07104-234501
E-mail: ghrietrn@raisoni.net Website: <http://ghrietrn.raisoni.net>



CO2- Understand specialized medium access control for wireless network such as SDMA, FDMA, TDMA, CDMA GSM, its technical requirement, its network structure and protocols.

CO3- Solve cryptography problems

CO4- Understand network layer protocols of wireless communication and transport Layer mechanisms.

CO5- Understand various hashing techniques.

Course Name: Advance Digital Image Processing

Class: Second Semester M-Tech(CSE)

Course Code: PGCSE203T

CBCS-2016

CO1- Understand the theory and algorithms that are widely used in digital image processing

CO2- Apply a proper image enhancement technique for given a set of noisy images.

CO3- Apply a proper image restoration technique and filters for given a set of noisy images.

CO4- Analyze different image segmentation techniques.

CO5- Apply different image compression techniques.

CO6- Create any application using different image processing techniques.

Course Name: Internet of Things

Class: Second Sem M-Tech CSE

Course Code: PGCSE204/2T

CBCS-2016

CO1- Understand the theoretical framework of IoT

CO2- Describes Applications of IoT, its Privacy, Security and Governance

CO3- Describes Architectural Approaches for IoT and IoT Challenges

CO4- Create and demonstrate the graphics function