

# SCIENT INSTITUTE OF TECHNOLOGY

Ibrahimpatnam. R.R Dist - 501506

(Approved by AICTE & Affiliated to JNTUH, Hyderabad)

#### **Department of Computer Science and Engineering**

#### Academic year 2017-2018

**Course outcomes** 

YEAR: I

Semester: I

**Regulation: R16** 

**Course Name: Mathematics-I** 

#### **Course Code: MA101BS**

#### At the end of this course each student should be able to:

<b>CO1</b>	Solve the first and higher order differential equations by various methods choosing the	L2	
	right method in different engineering problems		
CO2	Write the matrix representation of a set of linear equations and to analyze	L2	
	solutions of system of equations	112	
CO3	Find the Eigen values and Eigen vectors which come across under linear	1.2	
	transformations	L2	
<b>CO4</b>	Find the extreme values of functions of two variables with/ without constraints	L2	
CO5	Formation of the partial differential equations and solving the first order equations and standard type equations	L5	

#### **Course Name: Engineering Chemistry**

#### **Course Code: CH102BS**

#### At the end of this course each student should be able to:

CO1	Generalize knowledge of atomic, molecular and electronic changes, band theory related to conductivity	L3
CO2	Predict knowledge about importance of water and understanding its treatments methods	L4
CO3	Explain the principles and concepts of electrochemistry, Corrosion.	L2
CO4	State the Skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L1
CO5	Determine the configurational and conformational analysis of molecules and reaction mechanisms.	L4



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#### **Course Name: Engineering Physics-I**

#### **Course Code: PH103BS**

#### At the end of this course each student should be able to:

CO1	Identify the importance of light phenomena in thin films and resolution.	L2
CO2	Detect the principle and working of various laser systems.	L4
CO3	Examine the principle and working of various optical fibers and light propagation through optical fibers	L4
CO4	Distinguish various crystal systems and understand atomic packing factor	L4
CO5	Relate the various defects in crystals	L3

#### Course Name: Professional Communication in English Course Code: EN104HS

#### At the end of this course each student should be able to:

CO1	Improve Techniques for Effective Reading and writing and to be aware of Logical, Lexical and Grammatical Devices	L1
CO2	Comprehend the Technical vocabulary, Principles and Practice and to respond appropriately	L2
CO3	Analysis the Good Comprehension Skills & Techniques	L4
CO4	Demonstrate Steps in Effective Precis Writing	L3
CO5	Enhance the proficiency in the acquisition of language skill to Communicate confidently in formal and informal contexts.	L1 ,L4

#### **Course Name: Engineering Mechanics**

#### **Course Code: ME105ES**

CO1	Relate the basic force system. Determine the equilibrium of a particle in space using principle of laws of mechanics.	L3
CO2	Apply the principles of particle kinematics; compute the equilibrium of rigid bodies in two dimensions and in the three dimensions.	L3
CO3	Detect the concept of particle dynamics; calculate the principle moment of inertia of plane areas And Mass Moment of inertia composite sections. Find the location of centroid and calculate moment of inertia of a givensection.	L4
CO4	Evaluate the general equations of equilibrium. Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion	L4
CO5	Estimate the methods of minimization of potential energy solve the problems of simple system with sliding friction and calculate linear and angular acceleration of moving body in general plane motion. Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration.	L3



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#### **Course Name: Basic Electrical & Electronics Engineering**

#### **Course Code: EE106ES**

#### At the end of this course each student should be able to:

CO1	Analyse the concept of electrical circuits and its components	L4
CO2	Illustrate and solve problems of electrical circuits using network laws	L2
	and theorems	
CO3	Describe the concepts of diodes and transistors	L2
CO4	Demonstrate the knowledge of various configurations, characteristics and	L3
	applications	
CO5	Identify and characterize diodes and various types of transistors	L2

#### Course Name: English Language Communication Skills Lab Course Code: EN107HS

#### At the end of this course each student should be able to:

CO1	Understanding the nuances of English speech sounds, word accent, intonation and	L1,L3
CO2	Identify the strategies in communication through audio-visual experience	L2,L4
	and group activities	
CO3	Improve the fluency in spoken English and Neutralize their mothertongue influence	
		L1,L2,L3
CO4	Enhance Listening skills by listening and Practicing to eminent personalities's	L1,L2,L3,
	Presentations/Speeches	L5
CO5	Use the language appropriately & with clarity and confidence which in turn	L1,L3
	enhances their employability skills for public speaking and Interviews	

#### **Course Name: Engineering Workshop**

#### Course Code: ME108ES1505

CO1	Analyze machine tools and their operations	L4
CO2	Recognize manufacturing of components using workshop trades including pluming, fitting, carpentry, foundry, house wiring and welding	L4
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling.	L2
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3



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#### YEAR: I Semester:

#### **Regulation:R16**

#### Course Name: Engineering Physics-II

#### **Course Code: PH201BS**

#### At the end of this course each student should be able to:

CO1	Recognize the importance of behavior of a particle quantum mechanically	L4
CO2	Determine the concentration estimation of charge carriers in semi conductors	L4
CO3	Describe various magnetic dielectric properties and apply them in engineering applications.	L2,L3
CO4	Describe magnetic properties of the materials and know the basic principles of Superconductors.	L2
CO5	Identify the basic principles and applications of nano materials	L2

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#### Course Name: Mathematics-II

#### Course Code: MA102BS/MA202BS

#### At the end of this course each student should be able to:

CO1	Use Laplace transform techniques for solving DE's	L3
CO2	Evaluate integrals using Beta and Gamma functions	L4
CO3	Calculatemultipleintegralsandcanapplytheseconceptstofindareas, volumes, mom	L4
	entofinertiaetcofregionsonaplaneorinspace	
<b>CO4</b>	IdentifyGradient,Divergence,Curlandtheirphysicalandgeometricalinterpretati	L2
	on,Laplacianoperator,Vectoridentities	
CO5	Estimatetheline, surface and volume integrals and converting them from one to anot	L3
	her	

#### **Course Name: Mathematics-III**

#### **Course Code: MA203BS**

CO1	Differentiate among random variables involved in the probability models which are useful for all branches of engineering	L4
CO2	Calculate mean, proportions and variances of sampling distributions and to make important decisions s for few samples which are taken from a large data	L4
CO3	Solve the tests of ANOVA for classified data	L3
CO4	Find the root of a given algebraic and transcendental equations and solution of a system of equations	L2
CO5	Fit a curve for a given data and ,find the numerical solutions for a given first order initial value problem	L2



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**Course Name: Computer Programming in C** 

**Course Code: CS204ES** 

#### At the end of this course each student should be able to:

CO1	Demonstrate the basic knowledge of computer hardware and	L3
	software.	
CO2	Design algorithms for solving problems.	L5
CO3	Construct flowcharts for solving problems.	L5
CO4	Develop a given logic in C programming language.	L5
C05	Apply knowledge in using C language for solving problems.	L3

#### Course Name: Engineering Graphics Course Code: ME205ES

#### At the end of this course each student should be able to:

CO1	Discuss about section and orthographic views of engineering components	L3
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Outline the section views of solids and development of surfaces	L2
C05	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

Course Name: Engineering Chemistry Lab

#### Course Code: CH206BS

#### At the end of this course each student should be able to:

<i>CO1</i>	Determination of parameters like hardness and chloride content in water.	L4
CO2	Estimation of rate constant of a reaction from concentration – time	
	relationships	L3
CO3	Determination of physical properties like adsorption and viscosity.	L4
CO4	Calculation of Rf values of some organic molecules by TLC technique.	L4
CO5	Prepare the drug molecules and check the purity of organic molecule.	L5



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#### **Course Name: Engineering Physics Lab**

#### **Course Code: PH207BS**

#### At the end of this course each student should be able to:

CO1	Develop various Experimental skills which is very essential for an Engineering student	L5
CO2	Use the various tools like Screw gauge, Vernier Calipers, Physical Balance, Spectrometer and Microscope	L3
CO3	Determine the concept of error and its analysis. Develop experimental skills to design new experiments in Engineering	L4
CO4	compare the theory and correlate with experiment	L5
CO5	Develop various Experimental skills which is very essential for an Engineering student	L5

#### **Course Name: Computer Programming in C Lab**

#### **Course Code: CS208ES**

#### At the end of this course each student should be able to:

Design and test programs to sorre manomateur and selentine proclems.	LS
List the structured programs using control structures.	L1
List the Structured programs using functions.	L1
Develop the structured programs using sorting methods.	L5
Produce Programs in C using structured programming approach tosolve the	L5
	List the structured programs using control structures. List the Structured programs using functions. Develop the structured programs using sorting methods. Produce Programs in C using structured programming approach tosolve the problems.



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#### YEAR: II

Semester: I

**Course Code: CS302ES** 

#### Course Name: MATHEMATICS-IV

#### Course Code: MA301BS

#### At the end of this course each student should be able to:

CO1	Analyze the complex functions with reference to their analyticity	L4
	integration using Cauchy's integral theorem.	
CO2	Identify the Taylor's and Laurent's series expansion of complex functions	L2
CO3	Express any periodic function in term of sine's and cosine's	L2
CO4	Explain a non-periodic function as integral representation	L2
CO5	Analyze one dimensional wave and heat equation	L4

#### Course Name: Data Structures through C++ At the end of this course each student should be able to:

#### CO1 Identify appropriate data structures to represent data items in real world L2 problems. CO2 Analyze the time and space complexities of algorithms L4 CO3 Design programs using a variety of data structures such as stacks, queues, L5 hash tables, binary trees, search trees, heaps, graphs, and B-trees Implement various kinds of searching and sorting techniques. CO4 L5 Evaluate graphs & various Search trees & their comparison CO5 L4

# Course Name: Mathematical Foundations of Computer Science Course Code: CS303ES At the end of this course each student should be able to:

CO1	Apply mathematical logic to solve problems	L3
CO2	Identify sets, relations, functions, and discrete structures	L2
CO3	Use logical notation to define and reason about fundamental mathematical	L3
	concepts such as sets, relations, and functions.	
CO4	Formulate problems and solve recurrence relations	L5
CO5	Design and solve real-world problems using graphs and trees	L5

# Course name: Digital Logic DesignCourse Code: CS304ESAt the end of this course each student should be able to:

CO1	Identify number systems and codes.	L2
CO2	Solve Boolean expressions using Minimization methods.	L4
CO3	Design the sequential and combinational circuits.	L5
CO4	Apply state reduction methods to solve sequential circuits.	L3
CO5	`Recognize the concepts of memory & analyze the Register Transfer & its	L2
	microoperations	



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#### Course Name: Object Oriented Programming through Java Course Code: CS305ES

CO1	Solve real world problems using OOP techniques	L4
CO2	Recognize the use of abstract classes	L2
CO3	Solve problems using java collection framework and I/O classes	L4
CO4	Construct multithreaded applications with synchronization	L5
CO5	Develop applets for web applications & Design GUI based applications.	L5

#### At the end of this course each student should be able to:

# Course Name: Data Structures through C++ LabCourse Code: CS306ESAt the end of this course each student should be able to:

CO1	Identify the appropriate data structures and algorithms for solving real	L2
	worldproblems.	
CO2	Implement various kinds of searching and sorting techniques	L5
CO3	Develop data structures such as stacks, queues, trees to solve various	L5
	computing problems.	

#### Course Name: IT Workshop

#### **Course Code: CS307ES**

#### At the end of this course each student should be able to:

CO1	Apply knowledge for computer assembling and software installation	L3
CO2	Solve the trouble shooting problems	L4
CO3	Apply the tools for preparation of PPT, documentation and budget sheet etc	L3

#### Course Name: Object Oriented Programming through Java Lab Course Code: CS308PC

#### At the end of this course each student should be able to:

CO1	Solve real world problems using java collections frame	L4
CO2	Construct programs using abstract classes	L5
CO3	Implement multithreaded programs	L5
CO4	Develop GUI programs using swing controls in Java	L5

# Course Name: Environmental Science and TechnologyCourse Code: MC300ESAt the end of this course each student should be able to:

CO1	Identify the importance of ecological balance for sustainable development	L2
CO2	Recognize the impacts of developmental activities and mitigation measures.	L2
CO3	Discuss the environmental policies and regulations.	L2



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Semester: II

#### **Course Name: Computer Organization**

#### **Course Code: CS401BS**

#### At the end of this course each student should be able to:

CO1	List the basic components and the design of CPU, ALU and Control Unit.	L1
CO2	Define memory hierarchy and its impact on computer cost/performance.	L2
CO3	Recognize the advantage of instruction level parallelism and pipelining for highperformance Processor design.	L2
CO4	Identify the instruction set, instruction formats and addressing modes of 8086	L2
CO5	Construct assembly language programs to solve problems	L5

#### Course Name: Database Management Systems

#### **Course Code: CS402ES**

#### At the end of this course each student should be able to:

CO1	Demonstrate the basic elements of a relational database management system.	L3
CO2	Identify the data models for relevant problems	L2
CO3	Design entity relationship model and convert entity relationship diagrams intoRDBMS and formulate SQL queries on the data.	L5
CO4	Apply normalization for the development of application software.	L3
CO5	Express Storage and Indexing, Hash based indexing.	L2

#### **Course Name: Operating Systems**

#### **Course Code: CS403ES**

CO1	Apply optimization techniques for the improvement of system performance.	L3
CO2	Design and solve synchronization problems	L5
CO3	Describe about minimization of turnaround time, waiting time and response time and alsomaximization of throughput by keeping CPU as busy as possible.	L2
CO4	Identify Change access controls to protect files	L2
CO5	Compare the different operating systems	L4



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#### Course Name: Formal Languages and Automata Theory Course Code: CS404ES

#### At the end of this course each student should be able to:

CO1	Identify the concept of abstract machines and their power to recognize the languages	L2
CO2	Implement finite state machines for modeling and solving computing problems	L5
CO3	Design context free grammars for formal languages	L5
CO4	Distinguish between decidability and un-decidability	L4
CO5	Gain proficiency with mathematical tools and formal methods	L3

#### Course Name: Business Economics and Financial Analysis Course Code: SM405MS

#### At the end of this course each student should be able to:

CO1	Identify structure of business firm and significance of economics	L2
CO2	Acquire knowledge on Elasticity of demand and Supply analysis	L3
CO3	Recognize factors of production, Short run & Long run costs	L2
	functions, Marketstructures and types of pricing	
CO4	Outline financial accounting	L2
CO5	Gain a knowledge on ratios, Fund flow and Cash flow analysis	L3

#### Course Name: Computer Organization Lab

#### **Course Code: CS406ES**

#### At the end of this course each student should be able to:

CO1	Identify and apply the fundamentals of assembly level programming of microprocessors	L2
CO2	Develop assembly language programs for Evaluating expressions,	L5
	Arithmetic operations etc using GNU Assembler	
CO3	Develop assembly language programs for Armstrong numbers,	L5
	Fibonacci and factorial usingprocedure calls using GNU Assembler	

#### Course Name: Database Management Systems Lab Course Code: CS407ES

CO1	Design and implement a database schema for given problem	L5
CO2	Apply the normalization techniques for development of application software to realistic problems.	L3
CO3	Formulate queries using SQL DML/DDL/DCL commands.	L5
005	ronnunate queries using SQL DML/DCL commands.	

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#### Course Name: Operating Systems Lab

#### **Course Code: CS408ES**

CO1	Develop application programs using system calls in UNIX.	L5
CO2	Implement inter process communication between two processes	L5
CO3	Design and solve synchronization problems	L5
CO4	Simulate and implement operating system concepts such as scheduling, deadlock management, file management, and memory management.	L5

#### At the end of this course each student should be able to:

#### Course Name: Gender Sensitization Lab

#### **Course Code: MC400HS**

CO1	Identify the important issues related to gender in contemporary India.	L2
CO2	Discuss the materials derived from research, facts, everyday life, literature, and film	L2
CO3	Explain the gendered division of labour and its relation to politics and economic	L2
CO4	Develop a sense of appreciation of women in all walks of life.	L5
CO5	Interpret how gender discrimination works in our society and how to counter it	L3



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## At the end of this course each student should be able to:

**Course Name: Principles Of Programming Languages** 

CO1	Identify various programming paradigms, programming language
	Implementations
CO2	Explain data types, Expressions and Statements
CO3	Describe Subprograms and blocks
CO4	Discuss the concept of Abstract data types, Subprogram level concurrency and Exception handling
CO5	Explain functional programming language and scripting languages.

Semester:

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#### Course name: Intellectual Property Rights

#### At the end of this course each student should be able to:

CO1	Identify Intellectual property rights and its importance
CO2	Gain knowledge on trademarks
CO3	Discuss the law of copyrights and law of patents
CO4	Express trade secrets and misappropriation right of publicity.
CO5	Explain intellectual property and international developments in trade secrets law.

#### **Course Name: Software Engineering**

#### At the end of this course each student should be able to:

CO1	State the basics of software engineering and software process models
CO2	Identify the functional and non-functional requirements, System models
CO3	Describe the design process and design quality, software architecture
CO4	Explain the testing strategies and product metrics
CO5	Discuss risk management and quality management



**Regulation: R15** 

**Course Code: A50511** 

**Course Code: A50017** 

**Course Code: A50518** 

#### **Course Name: Compiler Design**

#### Course Code: A50514

#### At the end of this course each student should be able to:

C01	Identify the phases of compilation and top down parsing
CO2	Explain the bottom up parsing
CO3	Discuss semantic analysis and symbol tables

CO4 Examine the code optimization and data flow analysis

CO5 Evaluate the object code forms and Directed Acyclic Graphs

#### **Course Name: Operating Systems**

Course Code: A50510

#### At the end of this course each student should be able to:

CO1	Define basic concepts of Operating system and its implementation
CO2	Explain process scheduling and coordination
CO3	Discuss the memory management and virtual memory
CO4	Illustrate file system and Mass storage structure.
CO5	Demonstrate Deadlocks, System protection and Access control.



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#### Course Name: Computer Networks

#### At the end of this course each student should be able to:

CO1	State the types of computer networks and various layers of OSI
CO2	Identify various multiple access protocols
CO3	Gain the knowledge on Network layer
CO4	Discuss Internetworking and Transport layer
CO5	Explain transport protocol and application layer.

#### **Course Name: Operating Systems Lab**

#### Course Code:A50589

#### At the end of this course each student should be able to:

CO1	Demonstrate CPU scheduling algorithms such as Round robin, SJF, FCFS, Priority
$CO^2$	Develop file allocation strategies such as Sequential Indeved Linked
002	Develop me anocation strategies such as bequential, indexed, Eliked
CO3	Demonstrate MVT and MFT
CO4	Design File organization techniques such as Single level directory, two level,
	Hierarchical and DAG.
CO5	Implement banker algorithm for deadlock avoidance and deadlock prevention.
CO6	Design page replacement algorithms such as FIFO, LRU, LFU
CO7	Develop paging technique of memory management.

**Course Name: Compiler Design Lab** 

#### Course Code: A50587

CO1	Design lexical analyzer
CO2	Implement lexical analyzer using Jflex, flex or lex
CO3	Design predictive parser
CO4	Implement LALR bottom up parser
CO5	Construct abstract syntax tree.
CO6	Produce machine code from the abstract syntax tree generated by the parser.



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Semester: II

**Regulation: R15** 

**Course Name: Distributed Systems** 

#### At the end of this course each student should be able to:

CO1	Discuss basic concepts of distributed systems and system models
CO2	Identify time and global states, Coordination and agreement.
CO3	Illustrate inter process communication and distributed objects, remoteinvocation
CO4	Explain distributed file systems, name services, distributed shared memory
CO5	Analyze the distributed transactions and concurrency control.

#### **Course Name: Information Security**

#### At the end of this course each student should be able to:

CO1	Identify attacks on computers and cryptography
CO2	Discuss the Symmetric key ciphers and Asymmetric key ciphers
CO3	Explain message authentication algorithms and hash functions and its applications
CO4	Acquire knowledge on E-mail security.
CO5	Attain the knowledge on web security.

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#### YEAR: III

Course Code: A60521

**Course Code: A60522** 

#### Course Name: Object Oriented Analysis And Design

**Course Code: A60524** 

#### At the end of this course each student should be able to:

C01	Define basics of UML
CO2	Identify basic structural modeling and advanced structural modeling.
CO3	Discuss the behavior modeling such as Interaction diagrams, Usecase diagrams
CO4	Explain advanced behavior modeling
CO5	Recognize the patterns and frameworks, artifacts.

#### **Course name: Software Testing Methodologies**

#### Course Code: A60525

#### At the end of this course each student should be able to:

CO1	Define basic concepts of graphs and testing
CO2	Identify transaction flow testing techniques and dataflow testing
CO3	Recognize domain and interface testing
CO4	Explain path products, path expressions and logic based testing
CO5	Demonstrate state graphs, graph matrices and their application.

#### Course name: Managerial Economics And Financial Analysis

**Course Code: A60010** 

#### At the end of this course each student should be able to:

CO1	Identify nature and scope of managerial economics and significance of demand analysis
CO2	Discuss production function and cost analysis
CO3	Explain markets for perfect competition and New Economic environment which changes the business environment
CO4	Outline the significance of Capital budgeting
CO5	Identify the basic concepts of financial accounting and financial analysis



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#### **Course Name: Web Technologies**

#### Course Code: A60512

#### At the end of this course each student should be able to:

CO1	Use server side scripting using PHP
CO2	Identify HTML and XML documents along with various kinds of XMLdata parsers
CO3	Explain CGI for server applications and java server applications along with database connectivity
CO4	List the java server pages and its advantages over java servlets and sessiontracking
CO5	Use client side scripting and its importance

#### Course Name: Case Tools and Web Technologies Lab Course Code: A60591

CO1	Define concepts of UML and implement an ATM system.
CO2	Identify testing tools like Win-runner
CO3	Construct and evaluate hybrid CASE tools by integrating web testing tool, bug tracking tool, test management tool, open source testing tool
CO4	Use and Build CASE tools
CO5	Create an HTML page which includes java script
CO6	Create an HTML page which extract the data from the text box which is entered by the user.
CO7	Develop an HTML page that contains selection box with a list of 5 countries ,page must display its capital once the user selected.
CO8	Prepare an XML document
CO9	To develop an web application using PHP, Servlets and JSP



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#### Course Name: Advanced Communication Skills (ACS) Lab

**Course Code: A60086** 

#### At the end of this course each student should be able to:

CO1	List fundamentals of interpersonal communication and building vocabulary
CO2	Practice Reading comprehension, guessing meaning of the context.
CO3	Gain knowledge on writing skills
CO4	Acquire knowledge on presentation skills
CO5	To practice dynamics of group discussion and interview skills.



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#### YEAR: IV

#### Semester: I

**Regulation: R13** 

#### **Course Name: Linux Programming**

Course Code: A70511

At the end of this course each student should be able to:

CO1	Express Linux Utilities, Process utilities, Disk Utilities, Networking commands and
	other Commands, Shell programming
CO2	Outline File and Directory Concepts, File types, File System Structure, system calls
	for file I/O operations, file permissions
CO3	Identify Process concept, Kernel support for process, system call interface forprocess
	management, Kernel support for signals and Signal function
CO4	Explain inter process communication between processes on a singlecomputer system
	and different systems
CO5	Explain Kernel support for shared memory and socketprogramming using Berkeley
	Sockets

#### **Course Name: Design Pattern**

#### Course Code: A70530

CO1	Identify a Design Pattern, The Catalogue of Design Patterns, How to Use a
	Design Pattern
CO2	Express Designing of a Document Editor
CO3	List various Creational Patterns and Structural Patterns
CO4	Distinguish various Structural Patterns and Behavioural Patterns
CO5	Compare various Behavioural Patterns



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#### Course Name: Data Warehousing and Data Mining

#### At the end of this course each student should be able to:

CO1	Recognize significance of data warehouse in addition to database systems.
CO2	Identify data mining and its process steps.
CO3	Discuss frequent item set and its associations and algorithms to find the association rules.
CO4	Explain various classification techniques.
CO5	Identify various clusters techniques

#### **Course Name: Cloud Computing**

#### At the end of this course each student should be able to:

CO1	Define the virtualization and cloud computing concepts.
CO2	Identify Cloud Computing paradigms
CO3	Illustrate services which provided by cloud computing
CO4	Discuss Monitoring, Management and Applications of cloud computing
CO5	Explain Security and Legal Issues in Cloud computing

#### **Course Name: Mobile Computing**

#### At the end of this course each student should be able to:

CO1	Define the concept of mobile computing paradigm and its infrastructure through a popular GSM protocol.
CO2	Identify the issues and solutions of various layers of mobile networks.
CO3	Discuss transport layer protocols and the database issues in mobileenvironments
CO4	Explain about data delivery models and data synchronization
CO5	Outline Mobile Ad-hoc Networks, Protocols and Platforms for Mobile Computing.

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#### Course Code: A70519

Course Code: A70536

#### **Course Name: Information Retrieval Systems**

CO1	Identify different models for information retrieval and storage.
CO2	List various information retrieval utilities.
CO3	Discuss cross language information retrieval systems
CO4	Explain indexing and querying in retrieval systems
CO5	Discuss how to integrate the structure ad text data and web search.

#### At the end of this course each student should be able to:

#### Course Name: Linux Programming Lab

Course Code: A70596

#### At the end of this course each student should be able to:

CO1	Design shell scripts to solve the problems.
CO2	Implement some Linux standard utilities using system calls
CO3	Develop network based applications using c programming language

#### Course Name: Data Warehousing and Mining Lab Course Code:A70595

#### At the end of this course each student should be able to:

CO1	Apply data mining tasks using a data mining toolkit (such as WEKA) and visualize the results
CO2	Implement the algorithms for data mining tasks such association rule mining, classification, clustering and regression



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YEAR: IV

**Regulation: R13** 

## Course Name: Management Science

Course Code: A80014

At the end of this course each student should be able to:

CO1	Plan an organizational structure for a given context in the organization carry out
	production operations through Work study
CO2	Identify the markets, customers and competition better and price the given products
	appropriately.
CO3	Define quality for a given product or service.
CO4	Plan and control the HR function better
CO5	Prepare schedule and control projects through PERT and CPM

Course Name: Multimedia& Rich Internet Applications Course Code: A80547

Semester: II

At the end of this course each student should be able to:

CO1	Identify fundamentals concepts in text image and introduction to multimedia and
	hypermedia
CO2	Develop concepts in videos and digital audio
CO3	Create video compression techniques, web based search.
CO4	Design rich internet applications.
CO5	Develop different multimedia tools to produce web based and independent user
	interfaces.

#### Course Name: Adhoc and Sensor Networks

Course Code: A80542

CO1	Define the concept of ad-hoc & sensor networks
CO2	Identify transfer protocols for adhoc networks
CO3	Express the MAC protocols for adhoc networks and its applications
CO4	Define security of sensor networks
CO5	Evaluate measurements of protocol performance in sensornetworks.

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#### Course Name: Industry Oriented Mini Project

#### Course Code: A80087

CO1	Identify complete curriculum of the year.
CO2	Develop computer hardware and software
CO3	Construct security systems using encryption algorithms
CO4	Identify the workflow of a project





#### Course Name: Seminar

Course Code: A80089

#### At the end of this course each student should be able to:

CO1	Implement the communication skills
CO2	Apply skills to present any topic
CO3	Develop the understanding levels and to exhibit their knowledge
CO4	Analyse the attitude towards the guides

#### Course Name: Project Work

#### Course Code: A80088

#### At the end of this course each student should be able to:

CO1	Develop a real time project
CO2	Identify workflow of a software project
CO3	Gain technical knowledge learnt through all four years
CO4	Prepare their own projects practically

#### Course Name: Comprehensive viva

Course Code: A80090

CO1	Analyze the knowledge acquired in all core subjects
CO2	Examine communication skills
CO3	Determine the level of answering the questions







## **Department of Computer Science and Engineering**

#### Academic year 2018-2019

**Course outcomes** 

Semester: I

YEAR: I

**Regulation: R18** 

**Course Name: Mathematics -I** 

**Course Code: MA101BS** 

#### At the end of this course each student should be able to:

CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

#### Course Name: English

#### **Course Code: EN105HS**

#### At the end of this course each student should be able to:

CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.	L1,L 3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6



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#### **Course Name: Engineering Chemistry**

#### At the end of this course each student should be able to:

CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

#### **Course Name: Basic Electrical Engineering**

**Course Code: EE203ES** 

#### At the end of this course each student should be able to:

CO1	Analyse and Solve electrical circuits using network laws and theorems	
		L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-	12
	phase transformer, working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5

#### **Course Name: Engineering Chemistry Lab**

#### **Course Code: CH206BS**

#### At the end of this course each student should be able to:

CO1	Determination of parameters like hardness and chloride content in water	
		L4
CO2	Estimation of rate constant of a reaction from concentration	L3
	– time relationships – time relationships	
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rfvalues of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5



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#### At the end of this course each student should be able to:

CO1	Express the basic electrical laws.	
		L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4

#### Course Name: English Language and Communication skills Lab Course Code: EN107HS

#### At the end of this course each student should be able to:

CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	
		L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	
		L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent	111212
	for intelligibility	L1,L2,L3
CO4		
	Develop Speaking skills with clarity and confidence which in turn enhances their employability	L1,L3
	skills	
CO5	Use language appropriately for public speaking and Interviews	L3,L5

#### **Course Name: Engineering Workshop**

#### **Course Code: ME205ES**

#### At the end of this course each student should be able to:

CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3



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YEAR: I

Semester: II

**Regulation: R18** 

#### **Course Name: Mathematics -II**

#### **Course Code: MA201BS**

#### At the end of this course each student should be able to:

CO1	Solve the first order differential equations by various methods choosing the right method in	L4
	different engineering problems	
CO2	Solve the higher differential equation and apply the concept of differential equation to real	L4
	world problems	
CO3	The knowledge of multiple integrals to find the area's, volume's, moment of inertia in region	L2
	on a plane or in space.	
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl	L2
	gradient and their physical and geometrical interpretation	
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to	L2
	another like Gauss divergence, Greens & Stokes theorems	

#### **Course Name: Applied Physics**

#### **Course Code: AP202BS**

#### At the end of this course each student should be able to:

CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2



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#### **Course Name: Programming for Problem Solving**

#### **Course Code: CS103ES**

#### At the end of this course each student should be able to:

CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings, structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs using functions which are used to decompose a problem into different modules, developing programs using recursions and a concept of dynamic memory allocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

#### **Course Name: Environmental Science**

#### **Course Code: MC109ES**

#### At the end of this course each student should be able to:

CO1	Determine the Natural resources on which the structure of development is raised for sustainability of the society through equitable maintenance of natural resources	L4
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmentalproblems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcome the current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2



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#### **Course Name: Engineering Graphics**

#### CourseCode:ME104ES

#### At the end of this course each student should be able to:

CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5

#### **Course Name: Applied physics Lab**

#### **Course Code: AP205BS**

#### At the end of this course each student should be able to:

CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day – to – day life	L4

#### Course Name: Programming for Problem Solving Lab

#### **Course Code: CS206ES**

#### At the end of this course each student should be able to:

CO1	Formulate the algorithms for simple problems, and translate given algorithms to a	L5
	working and correct program	
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors	L4
	encountered during execution	
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5



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#### CO1 Apply mathematical logic to solve problems L3 CO2 Explain about sets, relations, functions, and discrete structures L2 CO3 Apply logical notation to define and reason about fundamental mathematical concepts L3 such as sets, relations, and functions. CO4 Formulate problems and solve recurrence relations L5 CO5 Design model and solve real-world problems using graphs and trees L5

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Analyze the time and space complexities of algorithms Develop programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs, and B-trees

Semester: I

Analyze and implement various kinds of searching and sorting techniques. L4 CO4 L5

Identify appropriate data structures to represent data items in real world problems.

CO5 | Design graphs & various Search trees & their comparison

CO1	Analyze the complex functions with reference to their analyticity integration using	L4
	Cauchy's integral theorem.	
CO2	Identify the Taylor's and Laurent's series expansion of complex functions	L2
CO3	Discuss any periodic function in term of sine's and cosine's	L2
CO4	Express a non-periodic function as integral representation	L2
CO5	Analyze one dimensional wave and heat equation	L4

At the end of this course each student should be able to:

#### At the end of this course each student should be able to:

Course Name: Data Structures through C++

At the end of this course each student should be able to:

**Course Name: Mathematical Foundations of Computer Science** 

**Regulation: R16** 

Course Code: MA301BS

### YEAR: II

CO1

CO2

CO3

**Course Name: MATHEMATICS-IV** 

**Course Code: CS302ES** 

L2

IA

L5

**Course Code: CS303ES** 

#### At the end of this course each student should be able to:

CO1	Define number systems and codes.	L1
CO2	Explain about Boolean expressions using Minimization methods.	L2
CO3	Design the sequential and combinational circuits.	L5
CO4	Apply state reduction methods to solve sequential circuits.	L3
CO5	Determine the concepts of memory & analyze the Register Transfer & its micro	L4
	operations	

#### Course Name: Object Oriented Programming through Java

**Course Code: CS305ES** 

#### At the end of this course each student should be able to:

CO1 Define real world problems using OOP techniques	L1
CO2 Explain the use of abstract classes	L2
CO3 Analyze problems using java collection framework and I/O classes	L4
CO4 Develop multithreaded applications with synchronization	L5
CO5 Design applets for web applications & Design GUI based applications.	L5

#### **Course Name: Data Structures through C++ Lab**

**Course Code: CS306ES** 

#### At the end of this course each student should be able to:

CO1	Identify the appropriate data structures and algorithms for solving real world problems.	L2
CO2	Implement various kinds of searching and sorting techniques	L5
CO3	Implement data structures such as stacks, queues, Search trees, and hash tables to solve various computing problems.	L5
CO4	Apply knowledge for computer assembling and software installation	L3
CO5	Apply the tools for preparation of PPT, documentation and budget sheet etc	L3



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#### Course Name: Object Oriented Programming through Java Lab

At the e	end of t	his course	each student	should	be able to:
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CO1	Design programs for solving real world problems using java collections frame	L5
CO2	Develop the programs using abstract classes	L5
CO3	Construct multithreaded programs	L5
CO4	Define GUI programs using swing controls in Java	L1

#### **Course Name: Environmental Science and Technology**

**Course Code: MC300ES** 

#### At the end of this course each student should be able to:

CO1	Discuss the importance of ecological balance for sustainable development.	L2
CO2	Determine the impacts of developmental activities and mitigation measures.	L4
CO3	Develop the environmental policies and regulations.	L5



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### YEAR: II Semester: II

## **Regulation: R16**

#### **Course Name: Computer Organization**

#### At the end of this course each student should be able to:

CO1	Explain the basic components and the design of CPU, ALU and Control Unit.	L2
CO2	Discuss memory hierarchy and its impact on computer cost/performance.	L2
CO3	Analyze the advantage of instruction level parallelism and pipelining for high performance Processor design.	L4
CO4	Determine the instruction set, instruction formats and addressing modes of 8086	L4
CO5	Develop assembly language programs to solve problems	L5

#### **Course Name: Database Management Systems**

#### **Course Code: CS402ES**

#### At the end of this course each student should be able to:

CO1	Demonstrate the basic elements of a relational database management system.	L3
CO2	Identify the data models for relevant problems	L2
CO3	Design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.	L5
CO4	Apply normalization for the development of application software.	L3
CO5	Identify a knowledge on Overview of Storage and Indexing, Hash based indexing.	L2

#### **Course Name: Operating Systems**

#### **Course Code: CS403ES**

#### At the end of this course each student should be able to:

CO1	Apply optimization techniques for the improvement of system performance.	L3
CO2	Design and solve synchronization problems	L5
CO3	Discuss about minimization of turnaround time, waiting time and response time and	L2
	also maximization of throughput by keeping CPU as busy as possible.	
CO4	Classify access controls to protect files	L4
CO5	Compare the different operating systems	L4



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**Course Code: CS401ES** 

#### **Course Name: Formal Languages and Automata Theory**

#### **Course Code: CS404ES**

#### At the end of this course each student should be able to:

CO1	Explain the concept of abstract machines and their power to recognize the languages.	L2
CO2	Determine finite state machines for modeling and solving computing problems.	L4
CO3	Design context free grammars for formal languages.	L5
CO4	Distinguish between decidability and undesirability	L4
CO5	Explain the proficiency with mathematical tools and formal methods.	L2

#### Course Name: Business Economics and Financial Analysis

**Course Code: SM405MS** 

#### At the end of this course each student should be able to:

CO1	Design the structure of business firm and significance of economics.	L5
CO2	Discuss Elasticity of demand and Supply analysis	L2
CO3	Explain the production, Short run & Long run costs functions, Marketstructures and types of pricing.	L2
CO4	Demonstrate financial accounting	L3
CO5	Analyze ratios, Fund flow and Cash flow analysis	L4

#### **Course Name: Computer Organization Lab**

#### **Course Code: CS406ES**

#### At the end of this course each student should be able to:

CO1	Apply the fundamentals of assembly level programming of microprocessors.	L3
CO2	Design assembly language programs for Evaluating expressions, Arithmetic operations etc using GNU Assembler.	L5
CO3	Develop assembly language programs for Armstrong numbers, Fibonacci and factorial using procedure calls using GNU Assembler	L5



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#### Course Name: Database Management Systems Lab

#### **Course Code: CS407ES**

At the end of this course each student should be able to:

CO1	Design and implement a database schema for given problem	L5
CO2	Apply the normalization techniques for development of application software to realistic problems.	L3
CO3	Formulate queries using SQL DML/DDL/DCL commands.	L5

#### Course Name: Operating Systems Lab

#### **Course Code: CS408ES**

#### At the end of this course each student should be able to:

CO1	Develop application programs using system calls in UNIX.	L5
CO2	Discuss inter process communication between two processes	L2
CO3	Design and solve synchronization problems	L5
CO4	Estimate and implement operating system concepts such as scheduling, deadlock management, file Management, and memory management.	L3

#### **Course Name: Gender Sensitization Lab**

#### **Course Code: MC400HS**

#### At the end of this course each student should be able to:

CO1	Develop a better understanding of important issues related to gender in contemporary India.	L5
CO2	Generalize to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everydaylife, literature, and film	L3
CO3	Analyze insight into the gendered division of labour and its relation to politics and economics	L4
CO4	Develop a sense of appreciation of women in all walks of life.	L5
CO5	Design a finer grasp of how gender discrimination works in our society and how to counter it.	L5



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#### **Course Name: Design and Analysis of Algorithms**

Course Code: CS501PC

# At the end of this course each student should be able to:

CO1	Define the basics of algorithm and ability to analyze the performances of	L1
	different algorithms and searching and sorting algorithms	
CO2	Develop appropriate algorithm design techniques for solving the problems	L5
CO3	Identify how the choice of data structures and the algorithm design methods	L2
	impact the overall performance of programs	
CO4	Analyze and Understanding how to solve the problems using the dynamic	L4
	programming by dividing it into sub problems	
CO5	Apply the problems of optimization and solving using the algorithms	L3

# Course Name: Data Communication and Computer Networks

**Course Code: CS502PC** 

#### At the end of this course each student should be able to:

CO1	Define the basics of computer networks and protocol stack of OSI model and basics of world wide web	L1
CO2	Analyze deeply the data link layer, its purpose, error controls, data loses and IEEE formats	L4
CO3	Explain the purpose of network layer, its operations, the flow of data and protocols	L2
CO4	Differentiate between UDP and TCP, data traffic, congestion control techniques an quality of services	L4
CO5	Determine the importance of application layer and its protocols in it	L4



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#### **Course Name: Software Engineering**

#### **Course Code: CS503PC**

#### At the end of this course each student should be able to:

CO1	Explain the purpose of software engineering and the minimum requirements needed	L2
	to construct an application by following different process models	
CO2	Determine the various requirements of an applications in order to develop, maintain,	L4
	efficient, reliable and cost effective software solutions	
CO3	Design the process, its quality and different models and creating the architectural	L5
	designs, styles and patterns as well as modeling the components	
CO4	Analyze the need of testing an application, different testing techniques and product	L4
	metrics at each level of software development	
CO5	Identify and analyzing the risk and quality of software	L2

## **Course Name: Fundamentals of Management**

#### Course Code: SM504MS

## At the end of this course each student should be able to:

CO1	Define the significance of management its roles, levels and challenges	L1
CO2	Describe the need of planning the decision making	L2
CO3	Explain the principles of organization, its empowerment and centralization an	L2
	decentralization concepts. Concepts of Human resource management	
CO4	Develop the role of leadership, its skills as a mentor and coach and motivation	L5
CO5	Apply the controlling process in budgetary and non-budgetary controls	L3



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## Course Name: Principles of Electronic Communication (OP-I) Course Code: EC5110E

At the end of this course each student should be able to:

CO1	Explain modulation and various analog and digital modulation schemes	L2
CO2	Design modulation and its techniques	L5
CO3	Determine the Telecommunication systems, networking and local area networks	L4
CO4	Estimate the satellite communication, ground satellite applications and optical	L4
	communication	
CO5	Analyze cellular and mobile communication in various modules	L4

#### Course Name: Design and Analysis of Algorithms Lab Course Code: CS505PC

## At the end of this course each student should be able to:

CO1	Develop programs in java to solve problems using algorithm design techniques for Divide and Conquer	L5
CO2	Design programs in java to solve problems using algorithm design techniquesfo Greedy technique	L5
CO3	Construct programs in java to solve problems using algorithm design techniques for Dynamic Programming	L5
CO4	Develop programs in java to solve problems using algorithm design techniques for Backtracking	L5

# Course Name: Computer Networks Lab

## Course Code: CS506PC

CO1	Explain the encryption and decryption concepts in Linux environment	L2
CO2	Apply appropriate algorithm for the finding of shortest route.	L3
CO3	Develop configure the routing table	L5



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## Course Name: Software Engineering Lab

## **Course Code: CS507PC**

At the end of this course each student should be able to:

CO1	Ability to understand the software engineering methodologies in the phases of projectdevelopment	
CO2	Ability to gain knowledge of Star UML open source tool	
CO3	Ability to analyse in developing product start-ups	
CO4	Ability to exercise on Course Management Systems, Easy Leave, E- Bidding, ElectronicCash Counter	

#### **Course Name:** Professional Ethics

#### **Course Code: MC500HS**

#### At the end of this course each student should be able to:

CO1	Explain the importance of Values and Ethics in their personal lives and professional careers.	
CO2	Discuss the rights and responsibilities as an employee, team member and a global citizen	
CO3	Develop the Professional Practices in Engineering	
CO4	Analyze Work Place Rights & Responsibilities	
CO5	Design the Global issues in Professional Ethics	



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Semester:

CO1	Design, develop, and implement a compiler for any language.	L5
CO2	Identify the use lex and yacc tools for developing a scanner and a parser.	L2
CO3	Develop and implement LL and LR parsers.	L5
CO4	Construct algorithms to perform code optimization in order to improve the	L5
	performance of a program in terms of space and time complexity.	
CO5	Design algorithms to generate machine code	L5

# **Course Name: Web Technologies**

**Course Name: Compiler design** 

#### At the end of this course each student should be able to:

CO1	Explain server side scripting using PHP	L2
CO2	Design HTML and XML documents along with various kinds of XML data	L5
	parsers	
CO3	Develop CGI for server applications and java server applications along with database connectivity	L5
CO4	Determine the java server pages and its advantages over java servlets and session tracking	L4
CO5	Demonstrate usage of client side scripting and its importance	L3

18



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**Course Code: CS601PC** 

**Course Code: CS602PC** 

# YEAR: III

#### Course Name: Cryptography & Network Security

At the end of this course each student should be able to:

CO1	Define the need of security, attacks, different techniques to encrypt and decrypt	L1
	the message	
CO2	Differentiate of Cryptographic algorithms and its procedure and also analyzing	L4
	the fundamental ideas of public-key cryptography	
CO3	Analyze the different principals of Security and its algorithms in order to attain it	L4
	and security information systems for both side of communication i.e between	
	client and server	
CO4	Determine the security at different layers of network and also in wireless	L4
	communication. And knowing how the data is transmitted through two different	
	wireless systems using secured protocols	
CO5	Analyze the applications of cryptography and security and maintaining the	L4
	security at whilesendinf the messages through different protocols.	

# Course name: Open Elective-II (Intellectual Property Rights)Course Code: CE623OEAt the end of this course each student should be able to:

CO1	List Different types of intellectual property, importance of intellectual property	L1
	rights	
CO2	Identify the Purpose and function of trademark, selecting, and evaluating trade mark	L2
	and its registration processes	
CO3	Explain the fundamental of copy right law and law of patents.	L2
CO4	Determine the Trade secrete law, determination of trade secrete status, unfair	L4
	competition	
CO5	Identify the new development of intellectual property and international overview on	L2
	intellectual property, and development in trade secrets law.	

# Course name: Professional Elective-I (Design Patterns)Course Code: CS612PEAt the end of this course each student should be able to:

CO1	Design patterns and how design pattern is used to solve design problems	L5
CO2	Analyze designing of document editor and how it used to solve design problems	L4
CO3	Apply knowledge on creational patterns like abstract factory, builder method,	L3
	Singleton set for class instantiation	
CO4	Discuss the structural pattern, Adapter pattern, Decorator and façade patterns	L2
CO5	Develop behavioral pattern like Command, Interpreter for better organization and	L5
	communication between objects	



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## Course Name: Cryptography and Network Security Lab

**Course Code: CS604PC** 

At the end of this course each student should be able to:

CO1	Develop C programs to perform character operations on strings	L5
CO2	Design java programs for substitution techniques	L5
CO3	Construct C/Java programs for encryption algorithms	L5
CO4	Design a program to calculate message digest	L5

#### Course Name: Web Technologies Lab

#### **Course Code: CS605PC**

#### At the end of this course each student should be able to:

CO1	Use LAMP Stack for web applications & to Use Tomcat Server for Servlets and JSPs	L3
CO2	Develop simple applications with Technologies like HTML, Javascript, AJAX, PHP, Servlets and JSPs	L5
CO3	Develop application connect to Database and get results	L5
CO4	Implement Parsing XML files using Java (DOM and SAX parsers)	L5

#### Course Name: Advance English Communication Skills Lab

**Course code: EN606HS** 

#### At the end of this course each student should be able to:

CO1	Explain vocabulary and use it contextually	L2
CO2	Analyze Listen and speak effectively	L3
CO3	Develop proficiency in academic reading and writing	L5
CO4	Discuss Increase possibilities of job prospects	L2
CO5	Identify confidently in formal and informal contexts	L2



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**Course Name: Linux Programming** 

Course Code: A70517

CO1	Able to acquire the knowledge on Linux Utilities, Process utilities, Disk
	Utilities, Networking commands and other Commands, Shell programming
CO2	Able to learn about File and Directory Concepts, File types, File System Structure,
	system calls for file I/O operations, file permissions
CO3	Able to know Process concept, Kernel support for process, system call interface for
	process management, Kernel support for signals and Signal function
CO4	Able to understand inter process communication between processes on a single
	computer system and different systems
CO5	To acquire the knowledge on Kernel support for shared memory and socket
	programming using Berkeley Sockets

Semester: I

## **Course Name: Design Patterns**

#### Course Code: A70530

CO1	Able to identify a Design Pattern, The Catalogue of Design Patterns, How to Use a
	Design Pattern
CO2	Able to understand Designing of a Document Editor
CO3	Able to understand various Creational Patterns and Structural Patterns
CO4	Able to understand various Structural Patterns and Behavioural Patterns
CO5	Able to understand various Behavioural Patterns

# Course Name: Data Warehousing And Data Mining

Course Code: A70520

CO1	Able to understand the data warehouse in addition to database systems.
CO2	Able to know data mining and its process steps.
CO3	Able to know frequent item set and its associations and algorithms to find the association rules.
CO4	Acquire the knowledge on various classification techniques.
CO5	Acquire the knowledge on various clusters techniques





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**Regulation: R15** 

#### **Course Name: Cloud Computing**

#### Course Code: A705190

CO1	Ability to understand the virtualization and cloud computing concepts.
CO2	Able to understand Cloud Computing paradigms
CO3	Able to acquire a knowledge on services which provided by cloud computing
CO4	Able to gain knowledge Monitoring, Management and Applications of cloud
	computing
CO5	Able to know Security and Legal Issues in Cloud computing

#### **Course Name: Software project Management**

#### Course Code: A70540

CO1	Ability to understand conventional software management, evolution of software
	economics.
CO2	Ability to understand conventional and modern software management and life cycle
	phases
CO3	Ability to learn artifacts of the process, model based software architectures
CO4	Ability to understand flows of the process, checkpoints and interactive process
	planning
CO5	Ability to gain knowledge on Project Organizations and Responsibilities, Process
	Automation and Project Control and Process Instrumentation

## Course Name: Information Retrieval Systems (E-II)

Course Code: A70533

CO1	The ability to store and retrieve textual documents using appropriate models
CO2	The ability to use the various retrieval utilities for improving search
CO3	An understanding of indexing and compressing documents to improve space and time efficiency
CO4	The ability to formulate SQL like queries for unstructured data
CO5	To Understand issues in web search



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#### **Course Name: Linux Programming Lab**

**Course Code: A70595** 

CO1	Able to write the shell scripts to solve the problems.
CO2	Able to implement some Linux standard utilities using system calls
CO3	Able to develop network based applications using c programming language

## Course Name: Data Warehousing And Mining Lab

CO1Able to learnand execute data mining tasks using a data mining toolkit (such as WEKA)<br/>and visualize the resultsCO2Able to apply the algorithms for data mining tasks such association rule mining,<br/>classification, clustering and regression



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#### YEAR: IV

#### Semester: II

**Regulation: R15** 

Course Management ScienceCO1To plan an organisational structure for a given context in the organisation carry out<br/>production operations through Work studyCO2To understand the markets, customers and competition better and price the given<br/>products appropriately.CO3To ensure quality for a given product or service.CO4To plan and control the HR function betterCO5To plan, schedule and control projects through PERT and CPM

#### Course Name: Multi Media Rich Internet Applications Course Code:A80547

CO1	Ability to develop fundamentals concepts in text image and introduction to multimedia and hypermedia
CO2	Ability to develop concepts in videos and digital audio
CO3	Ability to create video compression techniques, web based search.
CO4	Ability to create and design rich internet applications.
CO5	Ability to develop different multimedia tools to produce web based and independent
	user interfaces.



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## **Course Name: Storage Area Networks**

## Course Code :A80550

CO1	To understand Storage Area Networks characteristics and components.
CO2	To become familiar with the SAN vendors and their products.
CO3	To learn Fibre Channel protocols and how SAN components use them to communicate with each other.
CO4	To become familiar with Cisco MDS 9000 Multilayer Directors and Fabric Switches & thoroughly learn Cisco SAN-OS features.
CO5	To understand the use of all SAN-OS commands. Practice variations of SANOS features

Course	Name: Industry Oriented Mini Project	Course Code: A80087
CO1	It will be help full to understand the complete curriculum of the	year.
CO2	To develop computer hardware and software	
CO3	To develop security systems using encryption algorithms	
CO4	To know the workflow of a project	

Course	Name: Seminar	Course Code: A80089
CO1	To analyse the communication skills	
CO2	To be bold enough to present any topic	
CO3	To improve the understanding levels and to exhibit their	knowledge
CO4	To analyse the attitude towards the guides	





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Course	Name: Project Work	Course Code: A80088
CO1	To acquire knowledge on developing a real time pro	oject
CO2	To acquire knowledge on workflow of a software particular to a software	roject
CO3	To analyze the technical knowledge learnt through a	all four years
CO4	To be able to present their own projects practically	

Course	Name: Comprehensive Viva	Course Code: A80090
CO1	To analyse the knowledge acquired in all core subje	cts
CO2	To analyse communication skills	
CO3	To analyse the level of answering the questions	



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(Approved by AICTE & Affiliated to JNTUH, Hyderabad)

# **Department of Computer Science and Engineering**

# Academic Year 2019-20

## **Course outcomes**

# YEAR: I

Semester: I

**Regulation: R18** 

**Course Name: Mathematics -I** 

# Course Code: MA101BS

#### At the end of this course each student should be able to:

CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

#### **Course Name: English**

#### **Course Code: EN105HS**

CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6



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CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

# **Course Name: Basic Electrical Engineering**

#### **Course Code: EE203ES**

CO1	Analyse and Solve electrical circuits using network laws and theorems	
		L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5



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<i>CO1</i>	Determination of parameters like hardness and chloride content in water	
		L4
CO2	Estimation of rate constant of a reaction from concentration	L3
	– time relationships – time relationships	
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rfvalues of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

## Course Name: Basic Electrical Engineering Lab

## **Course Code:EE108ES**

# At the end of this course each student should be able to:

CO1	Express the basic electrical laws.	
		L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4
CO5	Express the basic electrical laws.	L2



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CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	
		L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	
		L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

## **Course Name: Engineering Workshop**

## **Course Code:ME205ES**

CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry, house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3



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#### YEAR: I

**Course Code: MA201BS** 

#### **Course Name: Mathematics -II**

At the end of this course each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Solve the first order differential equations by various methods choosing	L4
COI	the right method in different engineering problems	
COI	Solve the higher differential equation and apply the concept of differential	L4
02	equation to real world problems	
CO3	The knowledge of multiple integrals to find the area's, volume's, moment	L2
005	of inertia in region on a plane or in space.	
CO4	Understand the concept of scalar& vector point functions, vector operators,	L2
04	divergence, curl gradient and their physical and geometrical interpretation	
	Apply the knowledge of line, surface &volume integrals and converting	L2
CO5	them from one to another like Gauss divergence, Greens & Stokes	
	theorems	

#### **Course Name: Applied Physics**

#### Course Code: AP202BS

#### At the end of this course each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

## **Course Name: Programming for Problem Solving**

#### **Course Code: CS103ES**

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#### At the end of this course each student should be able to:

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S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings, structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs using functions which are used to decompose a problem into different modules, developing programs using recursions and a concept of dynamic memory allocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

S. No	Course Outcomes	<b>Bloom's Taxonomy</b>
		Level
	Determine the Natural resources on which the structure of development is	
CO1	raised for sustainability of the society through equitable maintenance	L4
	ofnatural resources	
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmentalproblems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcome the current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

## **Course Name: Engineering Graphics**

#### Course Code: ME104ES

S. No	Course Outcomes	<b>Bloom's Taxonomy</b>
		Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points, lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5



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S. No	Course Outcomes	<b>Bloom's Taxonomy</b>	
		Level	
CO1	Examine the usage of different components.	L4	
CO2	Construct the electrical circuits.	L5	
CO3	Compare the theory and co-relate with experiment	L4	
CO4	Recognize the applications of physics experiments in day $-$ to $-$ day life	L4	

# **Course Name: Programming for Problem Solving Lab**

#### **Course Code: CS206ES**

S. No	Course Outcomes	Bloom's Taxonomy
		Level
C01	Formulate the algorithms for simple problems, and translate given algorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5



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YEAR: II

Semester: I

**Regulation: R18** 

**Course Code: CS302PC** 

## **Course Name: Data Structures**

#### At the end of this course each student should be able to:

CO1	Define the basic data structures and its operations on stack and queue.	L1
CO2	Discuss the various dictionaries, representations and operations, analyzing the hash table representation.	L2
CO3	Analyze the different search trees and its operations using examples.	L4
CO4	Demonstrate the implementation and traversal methods of graphs and different sorting techniques.	L3
CO5	Design the different pattern matching algorithms and tries.	L5

#### **Course Name: Computer Oriented Statistical Methods**

**Course Code: MA303BS** 

CO1	Define the basics concepts of probability an distributions using sample	L1
	examples.	
CO2	Calculate the mathematical expectations and discrete probability	L4
	distributions.	
CO3	Evaluate the concept of Continuous Probability Distributions, Fundamental	L4
	Sampling theory on Distributions and its theorems.	
CO4	Illustrate the Estimation & Tests of Hypotheses on statistics and Statistical	L2
	Hypotheses concepts.	
CO5	Analyzing the concepts of Stochastic Processes and Markov Chains.	L4





CO1	Define the basics of instructions sets and their impact on	L1
	processor design	
CO2	Demonstrate the role of functional parts of a computer system, the	L3
	purpose of control unit, different instruction sets formats and addressing	
	modes.	
CO3	Develop the basics of computer arithmetic and its operations are performed	L5
	on different data types like floating point and decimal point operations	
CO4	Analyze the hardware parts of a computer system and its operations and	L5
	understanding the hierarchy of memory organization.	
CO5	Explain the different instruction sets and pipeline techniques, the purpose of	L4
	multi processors and its intercommunication process.	

#### **Course name: Object Oriented Programming using C++**

Course Code: CS305PC

CO1	State the OOPS concepts, implementations, and syntax and	L1
	Constructing simple programs.	
CO2	Describe the creation, structure, implementation of Classes, objects and data	L2
	abstraction.	
CO3	Analyze the inheritance concepts, its rules and implementation and	L4
	understanding the virtual functions its usage and concept of polymorphism	
	using simple programs.	
CO4	Estimate the formatted IO and Unformatted IO and error handling in file	L3
	operations.	
CO5	Develop the concept exception and Handling the exceptions during the	L5
	programming.	





<i>C</i> O1	Determine the different characteristics of components like Diodes, BJTs	L4
	and FETs and also knowing their applications	
CO2	Define the utilization of BJTs, Designing and analyzing small signal	L1
	amplifier circuits.	
CO3	Explain the Postulates of Boolean algebra and to minimize combinational	L2
	functions. Knowing the logic families and realization of logic gates.	
CO4	Design and analyze combinational logic circuits and its implementation	L5
	using logic gates.	
CO5	Analyze the sequential logic circuits, understanding the need of	L4
	counters and registers and basics of RAM and ROM	

## Course Name: Analog and Digital Electronics Lab

#### **Course Code: CS306ES**

## At the end of this course each student should be able to:

<i>CO</i> 1	Demonstrate the design and test rectifiers with filters	L3
CO2	Develop the construction and test amplifier circuits and interpret the results.	L5
CO3	Evaluates the postulates of the Boolean Algebra to minimize the Combinational circuits	L4
CO4	Analyze Combinational and Sequential circuits and verify the functionality.	L4
CO5	Design the logic gates using different Logic families and verify the functionality.	L5



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CO1	Calculate the importance of structure and Abstract data type, and their basic usability in different applications.	L4
CO2	Design the linear and non-linear data structures using linked lists.	L5
CO3	Discuss various data structures such as stacks, queues, trees, graphs etc. to solve various computing problems.	L2
CO4	Explain the various kinds of searching and sorting techniques, and decide when to choose which technique.	L2
CO5	Identify and use a suitable data structure and algorithm to solve a real world problem.	L2

## Course Name: IT Workshop Lab

## Course Code: CS308PC

#### At the end of this course each student should be able to:

CO1	Apply knowledge for computer assembling and software installation and	
	solvetrouble shooting problems	L3
CO2	Discuss use of internet and World Wide Web	L2
CO3	Analyze use of internet, www and web browsers	L4
CO4	Determine the tools for documentation	L4
CO5	Design the tools for ppt, Budget sheet etc	L5

# Course Name: C++ Programming Lab

## Course Code: CS309PC

CO1	Explain polymorphism and develop C++ programs	L2
CO2	Develop C++ programs with reusability concept.	L5
CO3	Compare classes & structures and develop C++ programs using classes	L4
	&	
	structures	
CO4	Develop C++ programs to handle exceptions in programming	L5
CO5	Determine different type of problems using object-oriented programming	L4
	Techniques	





# YEAR: II

Semester: II

**Regulation: R18** 

# Course Name: Business Economics & Financial Analysis

Course Code: SM402MS

## At the end of this course each student should be able to:

CO1	Explain the various forms of business and impact of economics on	L2
	business.	
CO2	Define demand and supply analysis which includes elasticity of demand and supply analysis.	L2
CO3	Determine the various factors of production, cost, market structures and pricing.	L3
CO4	Examine the knowledge on financial accounting.	L4
CO5	Analyze the knowledge on financial analysis through ratios.	L4

## **Course Name: Operating Systems**

#### Course Code: CS403PC

## At the end of this course each student should be able to:

CO1	Discuss the concepts of operating systems, real time systems, and	L2
	distributed systems.	
CO2	Analyze on process, CPU scheduling and system calls.	L4
CO3	Evaluate the concept of deadlocks, process management, and	L4
	synchronization and inter process communications.	
CO4	Develop memory management and virtual memory concepts.	L5
CO5	Design files systems implementations and operations.	L5

## Course Name: Database Management System

#### **Course Code: CS404PC**

CO1	Explain database system applications and database design	L2
CO2	Determine relational model, views and relational algebra	L4
CO3	Develop SQL queries, schema refinement	L5
CO4	Demonstrate the concepts on transaction management	L3
CO5	Evaluate file organization and indexing.	L4



## **Course Name: JAVA**

#### Course Code: CS405PC

#### At the end of this course each student should be able to:

CO1	Solve the real world problems using object oriented programming	L4
	techniques.	
CO2	Explain the packages and access protections, IO streams	L2
CO3	Analyze the fundamentals of exceptions and its handling mechanism in	L4
	java. To understand multithreading programs and thread synchronization.	
CO4	Define the java collections framework. And how to use the collection	L1
	classes.	
CO5	Develop the graphical user interface creation using java & to understand the	L5
	various components of GUI programming in java.	

## **Course Name: Discrete Mathematics**

## **Course Code: CS401PC**

## At the end of this course each student should be able to:

<i>C</i> O1	Define mathematical logics and proofs.	L1
CO2	Discuss practice sets, functions and relations and theirrepresentations.	L2
CO3	Calculate complexity of algorithms, structural induction and recursions.	L4
CO4	Determine discrete probability and accounting techniques	L4
CO5	Develop trees and graphs.	L5

# Course Name: Operating Systems Lab

## Course Code: CS406PC

CO1	Discuss about different CPU scheduling algorithms using C-language	L2
CO2	Solve c programs for different file allocation and file organization techniques	L4
CO3	Develop c programs for various memory allocation strategies like MVT and MFT	L5
CO4	Construct c programs for prevention and avoidance of deadlocks	L5
CO5	Develop c programs for paging technique and page replacement algorithms	L5





## Course Name: Database Management Systems Lab

**Course Code: CS407PC** 

At the end of this course each student should be able to:

CO1	Identify appropriate database schema for a given problem	L2
CO2	Design an E-R model for real world problem	L5
CO3	Develop relational model for schema refinement	L5
CO4	Construct a database for roadway travels and formulate quires using DD1, DM1, DCL commands	L5
CO5	Develop triggers, cursors for given problem	L5

# Course Name: Java Programming Lab

**Course Code: CS408PC** 

# At the end of this course each student should be able to:

CO1	Apply OOP in problem solving and develop basic programs.	L3
CO2	Develop basic programs on multithreading and exception handling	L5
CO3	Design code for accessing the information from files	L5
CO4	Construct code for data structures and sorting techniques	L5
CO5	Discuss GUI based applications using swings and applets	L2



PRINCIPAL Scient Institute of Technology YEAR: III

Semester: I

**Regulation: R16** 

# **Course Name: Software Engineering**

Course Code: CS503PC

# At the end of this course each student should be able to:

CO1	Define the purpose of software engineering and the minimum requirements needed to construct an application by following different	T 1
	process models.	LI
CO2	Determine the various requirements of an applications in order to	L4
	develop, maintain, efficient, reliable and cost effective software solutions.	
CO3	Design process, its quality and different models and creating the	L5
	architectural designs, styles and patterns as well as modeling the	
	components.	
CO4	Analyze the need of testing an application, different testing techniques	L4
	and product metrics at each level of software development.	
CO5	Identify and analyzing the risk and quality of software.	L2

## **Course name: Fundamentals of Management**

## Course Code: SM504MS

CO1	Discuss the significance of management its roles, levels and challenges	L2
CO2	Explain the need of planning the decision making	L2
CO3	Demonstrate the principles of organization, its empowerment and	L3
	centralization and decentralization concepts. Concepts of Human	
	resourcemanagement	
CO4	Analyze the role of leadership, its skills as a mentor and coach and	L4
	motivation	
CO5	Develop the controlling process in budgetary and non budgetary controls	L5



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# **Course Name: Data Communication and Computer Network**

Course Code: CS502PC

At the end of this course each student should be able to:

CO1	State the basics of computer networks and protocol stack of OSI model and	L1
	basics of world wide web.	
CO2	Analyze deeply the data link layer, its purpose, error controls, data loses and	L4
	IEEE formats.	
CO3	Determine the purpose of network layer, its operations, the flowof data and	L4
	protocols.	
CO4	Differentiate between UDP and TCP, data traffic, congestion control	L4
	techniques and quality of services.	
CO5	Explain the importance of application layer and its protocols in it.	L2

## **Course Name: Principles of Electronic Communications**

**Course Code: EC5110E** 

## At the end of this course each student should be able to:

CO1	Discuss modulation and various analog and digital modulation schemes.	L2
CO2	Explain about modulation and its techniques.	L2
CO3	Analyze the Telecommunication systems, networking and local area	L4
	networks.	
CO4	Determine the satellite communication, ground satellite applications and	L4
	optical communication.	
CO5	Develop cellular and mobile communication in various modules.	L5



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# **Course Name: Design and Analysis of Algorithms**

**Course Code: CS501PC** 

At the end of this course each student should be able to:

<i>CO1</i>	Explain the basics of algorithm and ability to analyze the performances of	L2
	different algorithms and searching and sorting algorithms.	
CO2	Identify appropriate algorithm design techniques for solving the problems.	L2
CO3	Discuss the choice of data structures and the algorithm design methods impact	L2
	the overall performance of programs.	
CO4	Analyze and Understanding how to solve the problems using the dynamic	L4
	programming by dividing it into sub problems.	
CO5	Examine the problems of optimization and solving using the algorithms.	L4

## Course Name: Design and Analysis of Algorithms Lab

Course Code: CS505PC

CO1	Develop programs in java to solve problems using divide and conquer strategy.	L5
CO2	Design programs in java to solve problems on graph traversals.	L5
CO3	Define programs in java to solve problems using backtracking strategy.	L1
CO4	Construct programs in java to solve problems using greedy techniques	L4
CO5	Solve programs in java to solve problems using dynamic programming.	L4



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Course Name: Computer Networks Lab

## Course Code: CS506PC

## At the end of this course each student should be able to:

CO1	Define error detection techniques.	L1
CO2	Apply appropriate algorithm for finding of shortest route.	L3
CO3	Discuss configure the routing table.	L2
CO4	Determine the encryption and decryption concepts in Linux environment	L4
CO5	Develop client/server communication	L5

Course Name: Software Engineering Lab

#### **Course Code: CS507PC**

CO1	Define software engineering process life cycle.	L1
CO2	Analyze and specify software requirements.	L4
CO3	Design and translate a specification into a design.	L5
CO4	Determine Built an SRS documents :Realize design practically,	L3
	using an appropriate software engineering	
CO5	Develop prototype model for a given case study using modern	L5
	engineering tools.	



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Semester: II

**Regulation: R16** 

#### **Course Name: Compiler design**

## Course Code: CS601PC

At the end of this course each student should be able to:

CO1	Define the language processors, structure of the compiler and lexical	L1
	analysis.	
CO2	Discuss the context free grammar and its syntax. And ability to understand	L2
	and design the parsers.	
CO3	Evaluate the syntax directed translation and intermediate code generation	L4
	procedure.	
CO4	Analyze the runtime environments and memory management. And identifying	L4
	the design issues in the code generator.	
CO5	Determine the sources of optimization, data flow analysis and redundancy	L4
	elimination.	

## **Course Name: Artificial Intelligence**

#### **Course Code: CS613PE**

## At the end of this course each student should be able to:

CO1	Explain the intelligent systems and fundamentals of AI and problem solving	L2
	techniques elimination.	
CO2	Discuss about logic concepts and logic programming and approaches to knowledge representation.	L2
CO3	Design phases in building expert systems and applications of expert systems	L5
	and finding uncertainty measures.	
CO4	Develop the machine learning and artificial neural networks and its design	L5
	issues.	
CO5	Determine advanced knowledge representation techniques and exploring case	L4
	study. And understand the natural language processing.	

#### Course Name: Cryptography & Network Security

#### **Course Code: CS603PC**

CO1	Identify the need of information security and its principles. And finding of security attack and mechanisms. Ability to know the cryptographic	L2
	techniques.	
CO2	Define the block cipher algorithms and public key cryptosystems.	L1
CO3	Discuss the message authentication methods and hash factions along with key	L2
	management and distributions.	
CO4	Identify the transport level security considerations and wireless security	L2
	models.	
$\overline{CO5}$	Determine the electronic mail security methods and exploring the case studies	L4
	on cryptography and security models.	





CO1	Classify the types of intellectual property, importance of intellectual property	L4
	rights.	
CO2	Identify the Purpose and function of trademark, selecting, and evaluating trade	L2
	mark and its registration processes.	
CO3	Discuss the fundamental of copy right law and law of patents.	L2
CO4	Determine the Trade secrete law, determination of trade secrete status, unfair	L4
	competition.	
CO5	Identify the new development of intellectual property and international	L2
	overview on intellectual property, and development in trade secrets law.	

## **Course Name: Web Technology**

## Course Code: CS602PC

#### At the end of this course each student should be able to:

CO1	Explain server side scripting using PHP	L2
CO2	Design HTML and XML documents along with various kinds of XML data	L5
	parsers	
CO3	Develop CGI for server applications and java server applications along with database connectivity	L5
CO4	Discuss the java server pages and its advantages over java servlets and session tracking	L2
CO5	Define the usage of client side scripting and its importance	L1

# Course Name: Cryptography and Network Security Lab

**Course Code: CS604PC** 

## At the end of this course each student should be able to:

CO1	Develop simple XOR operation for encryption of data	L5
CO2	Explain the use of C/Java to implement Symmetric cryptography	L2
CO3	Select C/Java to develop Asymmetric cryptography	L4
CO4	Design Diffie-Hellman Key exchange using HTML and Javascript.	L5
CO5	Construct java programs on MD-5 and SHA-1 algorithms	L5



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# Course Name: Web Technologies Lab

## At the end of this course each student should be able to:

CO1	Design a static website using HTML	L5
CO2	Construct JavaScript for validations	L5
CO3	Explain XML to store and forwarding data.	L2
CO4	Determine dynamic websites using PHP	L4
CO5	Develop Web applications by using JSP with Database Connectivity.	L5

# Course Name: Advance English Communication Skills Lab

Course code: EE606PC

CO1	Explain vocabulary and use it contextually	L2
CO2	Analyze Listen and speak effectively	L4
CO3	Develop proficiency in academic reading and writing	L5
CO4	Discuss Increase possibilities of job prospects	L2
CO5	Identify confidently in formal and informal contexts	L2



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# YEAR: IV Semester:

**Regulation: R16** 

**Course Name: Block Chain** 

At the end of this course each student should be able to:

CO1	Define block chain systems work.	L1
CO2	Discuss about Block chain Environment.	L2
CO3	Design, build, and deploy smart contracts and distributed applications.	L5
CO4	Identify the concepts of currency.	L2
CO5	Develop the concept of Integrate ideas from block chain technology	L5
	into their own projects	

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# **Course Name: Data Mining**

# **Course Code: CS701PC**

# At the end of this course each student should be able to:

CO1	Define data mining and its concepts	L1
CO2	Identify the association rules in large data sets.	L2
CO3	Examine classification in large data sets and solving the classification	L4
	problems using different approaches.	
CO4	Explain the clusters in large data sets.	L2
CO5	Classify web pages, extracting knowledge from the web.	L4

# **Course Name: PYTHON**

# Course Code: CS721PE

# At the end of this course each student should be able to:

CO1	Define to basics of python programming language, its syntax, data types	L1
	and expressions using the sample programs.	
CO2	Differentiate Control statements using sample programs	L4
CO3	Discuss the concept strings, text files, lists, dictionaries and sets.	L2
CO4	Identify Object-Oriented Programming, as well as in-depth data and	L2
	information processing techniques.	
CO5	List elements, programming, resources of Graphical User Interfaces,	L1
	simple graphics and image processing	





Course Code: CS743PE

CO1	Explain the purpose of Distributed systems, its characteristics and system	L2
	models.	
CO2	Determine the theoretical concepts, namely, virtual time, agreement and	L4
	consensus protocols.	
CO3	Develop IPC, Group Communication & RPC Concepts.	L5
CO4	Discuss the purpose of DFS, Name services and DSM Concepts.	L2
CO5	Analyze the concepts of transaction in distributed environment and	L4
	associated concepts, namely, concurrency control, deadlocks and error	
	recovery.	

# **Course Name: Principles of Programming Language**

## Course Code: CS702PC

## At the end of this course each student should be able to:

<i>CO</i> 1	List out the different paradigms of different programming languages,	
	syntax and semantics, the evolution of programming languages	L1
CO2	Explain the concepts of OO languages, functional languages, logical and	
	scripting languages.	L2
CO3	Discuss the principles and techniques involved in design and implementation	L2
	of modern programming languages.	
CO4	Design issues of different programming languages and the concepts of	L5
	concurrency control and exception handling.	
CO5	Identify different language paradigms and evaluate their relative benefits.	L2

## Course Name: Data Mining Lab

Course Code: CS703PC

CO1	Explain different kinds of data warehouse tools.	L2
CO2	Use the existing tool and perform data pre-processing.	L3
CO3	Analyze the data and apply appropriate algorithm for decisionmaking	L4
CO4	Design add mining algorithms as a component to the existing tool	L5
COS	Develop a system to help a loan officer to decide whether the credit of a	L5
COS	customer is good or bad using mining algorithms	


### Course Name: Python Programming Lab

### At the end of this course each student should be able to:

COL	Use the basic concepts scripting and the contributions of scripting language	
COI		L3
CO2	Examine the core data structures like lists, dictionaries, tuples and sets in	L4
02	Python to store, process and sort the data.	
CO3	Identify the external modules and import specific methods form them	L2
CO4	Demonstrate proficiency in handling Strings and File Systems.	L3
COS	Explore python especially the object oriented concepts, and thebuilt in	L2
COS	objects of Python.	

#### **Industry Oriented Mini Project Course Name:**

# **Course Code: CS705PC**

# At the end of this course each student should be able to:

CO1	Identify and define problems in the area of Computer science	L2
CO2	Explain and illustrate their practical skills needed tounderstand and modify problems related to programming and designing.	L2
CO3	Apply current technologies and develop applications for the problems.	L3
CO4	Plan to practice as teams on multidisciplinary projects with effective writing and communication skills.	L5
CO5	Apply the engineering and management principles to achieve the goal of the project.	L3

#### **Course Name:** Seminar

# **Course Code: CS706PC**

CO1	Determine recall existing technologies in the area of computer science	L4
CO2	Describe, compare and evaluate different technologies	L2
CO3	Define the area of interest	L1
CO4	Develop their communication skills	L5
CO5	Express technical reports.	L2





YEAR: IV

Semester: II

**Regulation: R16** 

**Course Name: MSE** 

Course Code: CS854PE

At the end of this course each student should be able to:

CO1	Define the concepts of Extreme programming(XP),its life cycle, and Agile development	L1
CO2	Discuss the need of collaborations, meetings, coding standards that are to be followed and reporting	L2
CO3	Analyze the concepts of bug free releases, versions, documentations and continuous integration	L4
CO4	Develop the planning, versions, risk planning, iteration plans and its estimations	L5
CO5	Determine the Focus on the development which is carried out by gathering the requirements, customers tests, development based on tests, design and architecture during the development, and testing the performance.	L4

**Course Name: Distributed Systems** 

Course Code: CS732PE

At the end of this course each student should be able to:

CO1	Design a new distributed system with the desired features	L5
CO2	Develop the literature survey leading to further research in any subarea.	L5
CO3	Discuss new distributed applications.	L2
CO4	Analyze what and why a distributed system is.	L4
CO5	Determine theoretical concepts, namely, virtual time, agreement and	L4
	consensus protocols.	



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# Course Name: WS & SOA

# Course Code: CS862PE

#### At the end of this course each student should be able to:

CO1	Determine the distributed computing and its technologies, evolution and emergence of web services and its tools, technologies, benefits and	L4
	challenges	
CO2	Design the architecture of a web service, standards, technologies in	L5
	implementing the steps for communication between the web services	
CO3	Discuss the XML Concepts, exploring different Test Strategies for	L2
	SOA based applications, its life cycle, communication model, error	
	handling techniques	
CO4	Analyze the registration and discovering services and understanding	L4
	theconcepts of UDDI, service addressing and notification	
CO5	Develop the security mechanisms at network and application layers,	L5
	security standards that need to be followed for XML, the role of	
	meta data in services, an overview of .NET,J2EE and managing	
	distributed systems and itsframework	

# Course Name: Major Project

# Course Code: CS801PC

CO1	Identify and define problems in the area of Computer science	L2
CO2	Explain and illustrate their practical skills needed tounderstand and modify problems related to programming and designing	L2
CO3	Apply current technologies and develop applications for the problems.	L3
CO4	Analyze as teams on multidisciplinary projects with effective writing and communication skills.	L4
CO5	Plan the engineering and management principles to achieve the goal of the project	L5



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# **Department of Computer Science and Engineering**

Academic Year 2020-21

**Course outcomes** 

# YEAR: I

Semester: I

**Regulation: R18** 

**Course Name: Mathematics -I** 

**Course Code: MA101BS** 

# At the end of this course each student should be able to:

CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

# **Course Name: English**

# **Course Code: EN105HS**

CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6



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CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

# **Course Name: Basic Electrical Engineering**

#### **Course Code: EE203ES**

# At the end of this course each student should be able to:

CO1	Analyse and Solve electrical circuits using network laws and theorems	
		L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5



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<i>CO1</i>	Determination of parameters like hardness and chloride content in water	
		L4
CO2	Estimation of rate constant of a reaction from concentration	L3
	– time relationships – time relationships	
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rfvalues of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

# **Course Name: Basic Electrical Engineering Lab**

# **Course Code: EE108ES**

#### At the end of this course each student should be able to:

CO1	Express the basic electrical laws.	
		L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4
CO5	Express the basic electrical laws.	
		L2



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CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	
		L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	
		L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

# **Course Name: Engineering Workshop**

### Course Code:ME205ES

CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry,	ТC
	house wiring and welding.	L5
CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3



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#### YEAR: I

**Course Code: MA201BS** 

#### **Course Name: Mathematics -II**

At the end of this course each student should be able to:

S. No	Course Outcomes	<b>Bloom's Taxonomy</b>
		Level
CO1	Solve the first order differential equations by various methods choosing the right method in different engineering problems	L4
CO2	Solve the higher differential equation and apply the concept of differential equation to real world problems	L4
CO3	The knowledge of multiple integrals to find the area's, volume's, moment of inertia in region on a plane or in space.	L2
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl gradient and their physical and geometrical interpretation	L2
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to another like Gauss divergence, Greens & Stokes theorems	L2

#### **Course Name: Applied Physics**

#### Course Code: AP202BS

#### At the end of this course each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

# **Course Name: Programming for Problem Solving**

#### **Course Code: CS103ES**

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings, structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs using functions which are used to decompose a problem into different modules developing programs using recursions and a concept of dynamic memory allocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2



S. No	Course Outcomes	<b>Bloom's Taxonomy</b>
		Level
	Determine the Natural resources on which the structure of development is	
CO1	raised for sustainability of the society through equitable maintenance	L4
	ofnatural resources	
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmentalproblems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcome the current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

# **Course Name: Engineering Graphics**

### Course Code: ME104ES

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5



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S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day $-$ to $-$ day life	L4

# Course Name: Programming for Problem Solving Lab

### **Course Code: CS206ES**

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Formulate the algorithms for simple problems, and translate given algorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5



YEAR: II

Semester: I

**Regulation: R18** 

**Course Code: CS302PC** 

# **Course Name: Data Structures**

# At the end of this course each student should be able to:

CO1	Define the basic data structures and its operations on stack and queue.	L1
CO2	Discuss the various dictionaries, representations and operations, analyzing the hash table representation.	L2
CO3	Analyze the different search trees and its operations using examples.	L4
CO4	Demonstrate the implementation and traversal methods of graphs and different sorting techniques.	L3
CO5	Design the different pattern matching algorithms and tries.	L5

#### **Course Name: Computer Oriented Statistical Methods**

**Course Code: MA303BS** 

CO1	Define the basics concepts of probability an distributions using sample	L1
	examples.	
CO2	Calculate the mathematical expectations and discrete probability	L4
	distributions.	
CO3	Evaluate the concept of Continuous Probability Distributions, Fundamental	L4
	Sampling theory on Distributions and its theorems.	
CO4	Illustrate the Estimation & Tests of Hypotheses on statistics and Statistical	L2
	Hypotheses concepts.	
CO5	Analyzing the concepts of Stochastic Processes and Markov Chains.	L4



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CO1	Define the basics of instructions sets and their impact on	L1
	processor design	
CO2	Demonstrate the role of functional parts of a computer system, the	L3
	purpose of control unit, different instruction sets formats and addressing	
	modes.	
CO3	Develop the basics of computer arithmetic and its operations are performed	L5
	on different data types like floating point and decimal point operations	
CO4	Analyze the hardware parts of a computer system and its operations and	L5
	understanding the hierarchy of memory organization.	
CO5	Explain the different instruction sets and pipeline techniques, the purpose of	L4
	multi processors and its intercommunication process.	

# Course name: Object Oriented Programming using C++

Course Code: CS305PC

CO1	State the OOPS concepts, implementations, and syntax and	L1
	Constructing simple programs.	
CO2	Describe the creation, structure, implementation of Classes, objects and data	L2
	abstraction.	
CO3	Analyze the inheritance concepts, its rules and implementation and	L4
	understanding the virtual functions its usage and concept of polymorphism	
	using simple programs.	
CO4	Estimate the formatted IO and Unformatted IO and error handling in file	L3
	operations.	
CO5	Develop the concept exception and Handling the exceptions during the	L5
	programming.	



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<i>C</i> O1	Determine the different characteristics of components like Diodes, BJTs	L4
	and FETs and also knowing their applications	
CO2	Define the utilization of BJTs, Designing and analyzing small signal	L1
	amplifier circuits.	
CO3	Explain the Postulates of Boolean algebra and to minimize combinational	L2
	functions. Knowing the logic families and realization of logic gates.	
CO4	Design and analyze combinational logic circuits and its implementation	L5
	using logic gates.	
CO5	Analyze the sequential logic circuits, understanding the need of	L4
	counters and registers and basics of RAM and ROM	

# Course Name: Analog and Digital Electronics Lab

#### **Course Code: CS306ES**

<i>CO</i> 1	Demonstrate the design and test rectifiers with filters	L3
CO2	Develop the construction and test amplifier circuits and interpret the results.	L5
CO3	Evaluates the postulates of the Boolean Algebra to minimize the Combinational circuits	L4
CO4	Analyze Combinational and Sequential circuits and verify the functionality.	L4
CO5	Design the logic gates using different Logic families and verify the functionality.	L5



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CO1	Calculate the importance of structure and Abstract data type, and their basic usability in different applications.	L4
CO2	Design the linear and non-linear data structures using linked lists.	L5
CO3	Discuss various data structures such as stacks, queues, trees, graphs etc. to solve various computing problems.	L2
CO4	Explain the various kinds of searching and sorting techniques, and decide when to choose which technique.	L2
CO5	Identify and use a suitable data structure and algorithm to solve a real world problem.	L2

# Course Name: IT Workshop Lab

### Course Code: CS308PC

### At the end of this course each student should be able to:

CO1	Apply knowledge for computer assembling and software installation and	
	solvetrouble shooting problems	L3
CO2	Discuss use of internet and World Wide Web	L2
CO3	Analyze use of internet, www and web browsers	L4
CO4	Determine the tools for documentation	L4
CO5	Design the tools for ppt, Budget sheet etc	L5

# Course Name: C++ Programming Lab

# Course Code: CS309PC

CO1	Explain polymorphism and develop C++ programs	L2
CO2	Develop C++ programs with reusability concept.	L5
CO3	Compare classes & structures and develop C++ programs using classes	L4
	&	
	structures	
CO4	Develop C++ programs to handle exceptions in programming	L5
CO5	Determine different type of problems using object-oriented programming	L4
	Techniques	





YEAR: II

Semester: II

**Regulation: R18** 

# Course Name: Business Economics & Financial Analysis

Course Code: SM402MS

### At the end of this course each student should be able to:

CO1	Explain the various forms of business and impact of economics on	L2
	business.	
CO2	Define demand and supply analysis which includes elasticity of demand and supply analysis.	L2
CO3	Determine the various factors of production, cost, market structures and pricing.	L3
CO4	Examine the knowledge on financial accounting.	L4
CO5	Analyze the knowledge on financial analysis through ratios.	L4

### **Course Name: Operating Systems**

#### Course Code: CS403PC

# At the end of this course each student should be able to:

CO1	Discuss the concepts of operating systems, real time systems, and distributed systems.	L2
CO2	Analyze on process, CPU scheduling and system calls.	L4
CO3	Evaluate the concept of deadlocks, process management, and synchronization and inter process communications.	L4
CO4	Develop memory management and virtual memory concepts.	L5
CO5	Design files systems implementations and operations.	L5

**Course Name: Database Management System** 

**Course Code: CS404PC** 

CO1	Explain database system applications and database design	L2
CO2	Determine relational model, views and relational algebra	L4
CO3	Develop SQL queries, schema refinement	L5
CO4	Demonstrate the concepts on transaction management	L3
CO5	Evaluate file organization and indexing.	L4



### **Course Name: JAVA**

### Course Code: CS405PC

### At the end of this course each student should be able to:

CO1	Solve the real world problems using object oriented programming	L4
	techniques.	
CO2	Explain the packages and access protections, IO streams	L2
CO3	Analyze the fundamentals of exceptions and its handling mechanism in	L4
	java. To understand multithreading programs and thread synchronization.	
CO4	Define the java collections framework. And how to use the collection	L1
	classes.	
CO5	Develop the graphical user interface creation using java & to understand the	L5
	various components of GUI programming in java.	

# **Course Name: Discrete Mathematics**

# Course Code: CS401PC

# At the end of this course each student should be able to:

<i>C</i> O1	Define mathematical logics and proofs.	L1
CO2	Discuss practice sets, functions and relations and their representations.	L2
CO3	Calculate complexity of algorithms, structural induction and recursions.	L4
CO4	Determine discrete probability and accounting techniques	L4
CO5	Develop trees and graphs.	L5

# Course Name: Operating Systems Lab

# Course Code: CS406PC

CO1	Discuss about different CPU scheduling algorithms using C-language	L2	
CO2	Solve c programs for different file allocation and file organization	L4	
	techniques		
CO3	Develop c programs for various memory allocation strategies like MVT and MFT	L5	
CO4	Construct c programs for prevention and avoidance of deadlocks	L5	
CO5	Develop c programs for paging technique and page replacement algorithms	L5	





### Course Name: Database Management Systems Lab

Course Code: CS407PC

# At the end of this course each student should be able to:

CO1	Identify appropriate database schema for a given problem	L2
CO2	Design an E-R model for real world problem	L5
CO3	Develop relational model for schema refinement	L5
CO4	Construct a database for roadway travels and formulate quires using DDl, DMl, DCL commands	L5
CO5	Develop triggers, cursors for given problem	L5

# Course Name: Java Programming Lab

Course Code: CS408PC

### At the end of this course each student should be able to:

CO1	Apply OOP in problem solving and develop basic programs.	L3
CO2	Develop basic programs on multithreading and exception handling	L5
CO3	Design code for accessing the information from files	L5
CO4	Construct code for data structures and sorting techniques	L5
CO5	Discuss GUI based applications using swings and applets	L2



PRINCIPAL Scient Institute of Technology YEAR: III

Semester: I

**Regulation: R18** 

# **Course Name: Software Engineering**

### At the end of this course each student should be able to:

	Ability to translate end-user requirements into system and software requirements, using e.g.	
CO1	UML, and structure the requirements in a Software Requirements Document	L3
CO2	Identify and apply appropriate software architectures and patterns to carry out high level	L3
	design of a system.	
CO3	Critically compare alternative choices of software architectures.	L4
CO4	Experience and/or awareness of testing problems.	L3
CO5	Develop a simple testing report.	L4

# Course name: Formal languages and automata theory

# **Course Code: CS501PC**

# At the end of this course each student should be able to:

CO1	Understand the concept of abstract machines and their power to recognize the languages	L2
CO2	Employ finite state machines for modeling and solving computing problems	L3
CO3	Design context free grammars for formal languages	L6
CO4	Distinguish between decidability and undesirability	L4
CO5	Gain proficiency with mathematical tools and formal methods	L4,L5



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Course Code: CS502PC

# **Course Name: COMPUTER NETWORKS**

# Course Code: CS503PC

#### At the end of this course each student should be able to:

CO1	Gain the knowledge of the basic computer network technology.	L4
CO2	Acquire knowledge of the functions of each layer in the OSI and TCP/IP reference model.	L3
CO3	Obtain the skills of subnetting and routing mechanisms.	L4
CO4	Apply essential protocols of computer networks in network design and implementation.	L3
CO5	Utilization of protocols in Electronic Mail.	L2,L3

# **Course Name: WEB TECHNOLOGIES**

# Course Code: CS504PC

# At the end of this course each student should be able to:

CO1	Gain knowledge of client-side scripting, validation of forms and AJAX programming	L2
CO2	Understand server-side scripting with PHP language	L3
CO3	Understand what is XML and how to parse and use XML Data with Java.	L2
CO4	To introduce Server-side programming with Java Servlets and JSP.	L3
CO5	Define the usage of client side scripting and its importance	L2



211

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# Course Name: Principles of Programming Language

### Course Code: CS515PE

At the end of this course each student should be able to:

<i>CO</i> 1	List out the different paradigms of different programming languages,	
	syntax and semantics, the evolution of programming languages	L1
CO2	Explain the concepts of OO languages, functional languages, logical and	
	scripting languages.	L2
CO3	Discuss the principles and techniques involved in design and implementation	L2
	of modern programming languages.	
CO4	Design issues of different programming languages and the concepts of	L5
	concurrency control and exception handling.	
CO5	Identify different language paradigms and evaluate their relative benefits.	L2

# Course Name: INFORMATION RETRIEVAL SYSTEMS Course Code: CS523PE

CO1	Understanding Information Retrieval System, its objectives and Functional overview of it.	L1,L2
CO2	To learn how cataloging and indexing is performed and data	L1,L2,
	Structures to store and its easy retrieval.	L3
CO3	Analyzing how automatic indexing is performed using statistics,	L2
	Probability and various clustering techniques.	
CO4	Ability to learn techniques to implement user search and information	L1,L2
	Visualization.	
CO5	Understanding various hardware and software techniques to search	L1,L2,
	the text and retrieval of multimedia information.	L3



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# Course Name: Computer networks and web technologies lab

**Course Code: CS506PC** 

### At the end of this course each student should be able to:

CO1	Implement data link layer farming methods	L2
CO2	Analyze error detection and error correction codes.	L3
CO3	Implement and analyze routing and congestion issues in network design.	L4
CO4	Implement Encoding and Decoding techniques used in presentation layer	L3
CO5	To be able to work with different network tools	L2

# Course Name: Software Engineering Lab

# Course Code: CS505PC

### At the end of this course each student should be able to:

CO1	Define software engineering process life cycle.	L1
CO2	Analyze and specify software requirements.	L4
CO3	Design and translate a specification into a design.	L5
CO4	Determine Built an SRS documents :Realize design practically,	L3
	using an appropriate software engineering	
CO5	Develop prototype model for a given case study using modern	L5
	engineering tools.	



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Scient Institute of Technology

# Course name: Advanced Communication Skills Lab Course Code: EN508HS

S. No	Course Outcomes	Bloom's Taxonomy Levels
CO1	Build sound vocabulary and its proper use contextually	L3
CO2	Use of functional English effectively in formal and informal contexts	L4
CO3	Develop effective speaking skills and Maximize job prospects	L5
CO4	Plan and make different forms of presentation using various techniques	L2
CO5	Understand an effective speaking skills and Maximize job prospects.	L2,L3

# At the end of this course each student should be able to:



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### YEAR: III

# Semester: II

**Regulation: R18** 

### **Course Name: MACHINE LEARNING**

# **Course Code: CS601PC**

### At the end of this course each student should be able to:

CO1	This course explains machine learning techniques such as decision tree learning,	L2
	Bayesian learning etc.	
CO2	To understand computational learning theory.	L2
CO3	To study the pattern comparison techniques.	L2
CO4	To study about unsupervised learning techniques instance based ,experience based algorithms.	L1
CO5	Course explains Artificial neural networks.	L1

# Course Name: Compiler design

# Course Code: CS602PC

CO1	Define the language processors, structure of the compiler and lexical	L1
	analysis.	
CO2	Discuss the context free grammar and its syntax. And ability to understand	L2
	and design the parsers.	
CO3	Evaluate the syntax directed translation and intermediate code generation	Ι <i>Λ</i>
COS	Evaluate the syntax directed translation and intermediate code generation	L4
	procedure.	
CO4	Analyze the runtime environments and memory management. And identifying	L4
	the design issues in the code generator.	
CO5	Determine the sources of optimization, data flow analysis and redundancy	L4
	elimination.	



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<i>CO1</i>	Explain the basics of algorithm and ability to analyze the performances of	L2
	different algorithms and searching and sorting algorithms.	
CO2	Identify appropriate algorithm design techniques for solving the problems.	L2
CO3	Discuss the choice of data structures and the algorithm design methods impact	L2
	the overall performance of programs.	
CO4	Analyze and Understanding how to solve the problems using the dynamic	L4
	programming by dividing it into sub problems.	
CO5	Examine the problems of optimization and solving using the algorithms.	L4

# Course Name: Software testing methodologies

#### Course Code: CS615PE

### At the end of this course each student should be able to:

CO1	Explain the intelligent systems and fundamentals of AI and problem solving	L2
CO2	Discuss about logic concepts and logic programming and approaches to	L2
	knowledge representation.	
CO3	Design phases in building expert systems and applications of expert systems	L5
	and finding uncertainty measures.	
CO4	Develop the machine learning and artificial neural networks and its design	L5
	issues.	
CO5	Determine advanced knowledge representation techniques and exploring case	L4
	study. And understand the natural language processing.	

#### **Course Name: Non-conventional energy sources**

#### Course Code: MT96010E

CO1	Demonstrate the generation of electricity from various Non-Conventional sources of energy,	L2
	have a working knowledge on types of fuel cells.	
CO2	Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and	L1
	conversion of it to electricity generation	
CO3	Explore the concepts involved in wind energy conversion system by studying its	L2
	components, types and performance.	
CO4	Illustrate ocean energy and explain the operational methods of their utilization.	L2
CO5	Acquire the knowledge on Geothermal energy on cryptography and security models.	L4
1		





# Course Name: MACHINE LEARNING LAB

# At the end of this course each student should be able to:

CO1	understand complexity of Machine Learning algorithms and their limitations;	L1
CO2	Understand modern notions in data analysis-oriented computing;	L2
CO3	Be capable of confidently applying common Machine Learning algorithms in practice and	L1,
	implementing their own;	L2
CO4	Be capable of performing experiments in Machine Learning using real-world data.	L4

#### **Course Name: COMPILER DESIGN LAB**

#### Course Code: CS605PC

### At the end of this course each student should be able to:

CO1	Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript	L1,
	and XML	L2
CO2	Apply client-server principles to develop scalable and enterprise web applications.	L2
CO3	Ability to design, develop, and implement a compiler for any language.	L2
CO4	Able to use lex and yacc tools for developing a scanner and a parser.	L3
CO5	Able to design and implement LL and LR parsers.	L1,
		L2

# Course Name: Software Testing Methodologies Lab

**Course Code:** 

#### CS625PE At the end of this course each student should be able to:

CO1	Design and develop the best test strategies in accordance to the development model.	L1
CO2	Well developed knowledge in comparing the various testing strategies as well.	L2
CO3	Know the basic techniques for deriving test cases	L3
CO4	Able to test a domain or an application and identifying the nice and ugly domains.	L1,L
		2
CO5	Apply appropriate software testing tools, techniques and methods for even more effective systems during both the test planning and test execution phases of a software development	L2
	project	



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# YEAR: IV

**Regulation: R16** 

**Course Name: Block Chain** 

At the end of this course each student should be able to:

CO1	Define block chain systems work.	L1
CO2	Discuss about Block chain Environment.	L2
CO3	Design, build, and deploy smart contracts and distributed applications.	L5
CO4	Identify the concepts of currency.	L2
CO5	Develop the concept of Integrate ideas from block chain technology into their own projects	L5

# **Course Name: Data Mining**

# **Course Code: CS701PC**

# At the end of this course each student should be able to:

CO1	Define data mining and its concepts	L1
CO2	Identify the association rules in large data sets.	L2
CO3	Examine classification in large data sets and solving the classification	L4
	problems using different approaches.	
CO4	Explain the clusters in large data sets.	L2
CO5	Classify web pages, extracting knowledge from the web.	L4

# **Course Name: PYTHON**

# **Course Code: CS721PE**

# At the end of this course each student should be able to:

CO1	Define to basics of python programming language, its syntax, data types	L1
	and expressions using the sample programs.	
CO2	Differentiate Control statements using sample programs	L4
CO3	Discuss the concept strings, text files, lists, dictionaries and sets.	L2
CO4	Identify Object-Oriented Programming, as well as in-depth data and	L2
	information processing techniques.	
CO5	List elements, programming, resources of Graphical User Interfaces,	L1
	simple graphics and image processing	



**Course Code: CS743PE** 

Semester:

Ι

CO1	Explain the purpose of Distributed systems, its characteristics and system	L2
	models.	
CO2	Determine the theoretical concepts, namely, virtual time, agreement and	L4
	consensus protocols.	
CO3	Develop IPC, Group Communication & RPC Concepts.	L5
CO4	Discuss the purpose of DFS, Name services and DSM Concepts.	L2
CO5	Analyze the concepts of transaction in distributed environment and	L4
	associated concepts, namely, concurrency control, deadlocks and error	
	recovery.	

# **Course Name: Principles of Programming Language**

# Course Code: CS702PC

# At the end of this course each student should be able to:

<i>CO</i> 1	List out the different paradigms of different programming languages,	
	syntax and semantics, the evolution of programming languages	L1
CO2	Explain the concepts of OO languages, functional languages, logical and	
	scripting languages.	L2
CO3	Discuss the principles and techniques involved in design and implementation	L2
	of modern programming languages.	
CO4	Design issues of different programming languages and the concepts of	L5
	concurrency control and exception handling.	
CO5	Identify different language paradigms and evaluate their relative benefits.	L2

# Course Name: Data Mining Lab

Course Code: CS703PC

CO1	Explain different kinds of data warehouse tools.	L2
CO2	Use the existing tool and perform data pre-processing.	L3
CO3	Analyze the data and apply appropriate algorithm for decision making	L4
CO4	Design add mining algorithms as a component to the existing tool	L5
COS	Develop a system to help a loan officer to decide whether the credit of a	L5
COS	customer is good or bad using mining algorithms	



### Course Name: Python Programming Lab

#### At the end of this course each student should be able to:

COL	Use the basic concepts scripting and the contributions of scripting language	
COI		L3
CO2	Examine the core data structures like lists, dictionaries, tuples and sets in	L4
	Python to store, process and sort the data.	
CO3	Identify the external modules and import specific methods form them	L2
CO4	Demonstrate proficiency in handling Strings and File Systems.	L3
COS	Explore python especially the object oriented concepts, and the built in	L2
COS	Objects of Python.	

# Course Name: Industry Oriented Mini Project

# Course Code: CS705PC

# At the end of this course each student should be able to:

CO1	Identify and define problems in the area of Computer science	L2
CO2	Explain and illustrate their practical skills needed to understand and modify problems related to programming and designing.	L2
CO3	Apply current technologies and develop applications for the problems.	L3
CO4	Plan to practice as teams on multidisciplinary projects with effective writing and communication skills.	L5
CO5	Apply the engineering and management principles to achieve the goal of the project.	L3

### Course Name: Seminar

### Course Code: CS706PC

# At the end of this course each student should be able to:

CO1	Determine recall existing technologies in the area of computer science	L4
CO2	Describe, compare and evaluate different technologies	L2
CO3	Define the area of interest	L1
CO4	Develop their communication skills	L5
CO5	Express technical reports.	L2





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Semester: II

**Regulation: R16** 

**Course Name: MSE** 

Course Code: CS854PE

At the end of this course each student should be able to:

CO1	Define the concepts of Extreme programming(XP),its life cycle,	L1
	and Agile development	
CO2	Discuss the need of collaborations, meetings, coding standards that	L2
	are to be followed and reporting	
CO3	Analyze the concepts of bug free releases, versions, documentations	L4
	and continuous integration	
CO4	Develop the planning, versions, risk planning, iteration plans and its	L5
	estimations	
CO5	Determine the Focus on the development which is carried out	L4
	by gathering the requirements, customers tests, development	
	based on tests, design and architecture during the development,	
	and testing the performance.	

**Course Name: Distributed Systems** 

Course Code: CS732PE

At the end of this course each student should be able to:

CO1	Design a new distributed system with the desired features	L5
CO2	Develop the literature survey leading to further research in any subarea.	L5
CO3	Discuss new distributed applications.	L2
CO4	Analyze what and why a distributed system is.	L4
CO5	Determine theoretical concepts, namely, virtual time, agreement and	L4
	consensus protocols.	



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#### Course Name: WS & SOA

#### Course Code: CS862PE

#### At the end of this course each student should be able to:

CO1	Determine the distributed computing and its technologies, evolution and emergence of web services and its tools, technologies, benefits and challenges	L4
CO2	Design the architecture of a web service, standards, technologies in implementing the steps for communication between the web services	L5
CO3	Discuss the XML Concepts, exploring different Test Strategies for SOA based applications, its life cycle, communication model, error handling techniques	L2
CO4	Analyze the registration and discovering services and understanding theconcepts of UDDI, service addressing and notification	L4
CO5	Develop the security mechanisms at network and application layers, security standards that need to be followed for XML, the role of meta data in services, an overview of .NET,J2EE and managing distributed systems and itsframework	L5

# Course Name: Major Project

# **Course Code: CS801PC**

CO1	Identify and define problems in the area of Computer science	L2
CO2	Explain and illustrate their practical skills needed tounderstand and modify problems related to programming and designing	L2
CO3	Apply current technologies and develop applications for the problems.	L3
CO4	Analyze as teams on multidisciplinary projects with effective writing and communication skills.	L4
CO5	Plan the engineering and management principles to achieve the goal of theproject	L5



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# **Department of Computer Science and Engineering**

Academic Year 2021-22

**Course outcomes** 

# YEAR: I

Semester: I

**Regulation: R18** 

**Course Name: Mathematics -I** 

**Course Code: MA101BS** 

### At the end of this course each student should be able to:

CO1	Determine the Rank, Echelon form and analyse the solution system of equations for consistency and inconsistency	L2
CO2	Find the Eigen values and vectors of a matrix and reduce the quadratic form to canonical form by orthogonal transformation	L4
CO3	Analyze the nature of sequence and series, Test the convergence of a series by applying the different tests	L4
CO4	Interpret the applicability of mean value theorems. Evaluate multiple integrals, measure the area and volume of given regions. Evaluate integrals by using Beta, Gamma functions.	L2
CO5	Analyze the problems related to Partial Differentials and relate its applications to engineering subjects	L2

#### **Course Name: English**

# **Course Code: EN105HS**

CO1	Apply basic grammar principles and synthesize and transform sentences	L1,L3
CO2	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.	L1,L3
CO3	Self introspect and self vigilance to achieve high quality of life, strength and sovereignty of a developed nation	L4
CO4	Improve the exposure to universal happenings	L1
CO5	Envision the dangers of scientific and technological innovations	L4,L6



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CO1	Describe the atomic, molecular and electronic changes, band theory related to conductivity	L2
CO2	Identify the knowledge about importance of water and understanding its treatments methods	L2
CO3	Determine the principles and concepts of electrochemistry, corrosion.	L4
CO4	Explain the skills to get clear concepts on basic spectroscopy and application to medical and other fields.	L2
CO5	Predict the configurational and conformational analysis of molecules and reaction mechanisms	L4

# **Course Name: Basic Electrical Engineering**

#### **Course Code: EE203ES**

#### At the end of this course each student should be able to:

CO1	Analyse and Solve electrical circuits using network laws and theorems	
		L4
CO2	Demonstrate and analyse the AC circuits	L3
CO3	Discuss the working principle, EMF equation, phasor diagram, losses, efficiency, regulation of 1-phase transformer ,working principle of Auto-transformer	L2
CO4	Determine the working principles of Electrical Machines	L4
CO5	Develop various switches and batteries	L5



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# **Course Name: Engineering Chemistry Lab**

#### At the end of this course each student should be able to:

<i>CO1</i>	Determination of parameters like hardness and chloride content in water	
		L4
CO2	Estimation of rate constant of a reaction from concentration	L3
	– time relationships – time relationships	
CO3	Determination of physical properties like adsorption and viscosity	L4
CO4	Calculation of Rfvalues of some organic molecules by TLC technique	L4
CO5	Determine the synthesis of drug preparation	L5

# Course Name: Basic Electrical Engineering Lab

# **Course Code: EE108ES**

#### At the end of this course each student should be able to:

CO1	Express the basic electrical laws.	
		L2
CO2	Analyze the response of different types of electrical circuits to different excitations.	L4
CO3	Formulate the measurement, calculation and relation between the basic electrical parameters	L5
CO4	Determine the basic characteristics of transformers and electrical machines.	L4
CO5	Express the basic electrical laws.	
		L2



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CO1	Interpret the nuances of English speech sounds, word accent, intonation and rhythm	
		L4
CO2	Apply the nuances of English language through audio- visual experience and group activities	
		L2,L4
CO3	Improve the fluency in spoken English and Neutralization their mother tongue influence of accent for intelligibility	L1,L2,L3
CO4	Develop Speaking skills with clarity and confidence which in turn enhances their employability skills	L1,L3
CO5	Use language appropriately for public speaking and Interviews	L3,L5

# **Course Name: Engineering Workshop**

# **Course Code:**

CO1	Describe machine tools and their operations	L2
CO2	Produce components using workshop trades including pluming, fitting, carpentry, and foundry,	L5
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CO3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling	L2,L3
CO4	Apply basic electrical engineering knowledge for house wiring practice	L3
CO5	Use various type of measuring and gauging instrument for different type of operation	L3



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#### YEAR: I

**Course Code: MA201BS** 

#### **Course Name: Mathematics -II**

At the end of this course each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Solve the first order differential equations by various methods choosing the right method in different engineering problems	L4
CO2	Solve the higher differential equation and apply the concept of differential equation to real world problems	L4
CO3	The knowledge of multiple integrals to find the area's, volume's, moment of inertia in region on a plane or in space.	L2
CO4	Understand the concept of scalar& vector point functions, vector operators, divergence, curl gradient and their physical and geometrical interpretation	L2
CO5	Apply the knowledge of line, surface &volume integrals and converting them from one to another like Gauss divergence, Greens & Stokes theorems	L2

#### **Course Name: Applied Physics**

#### Course Code: AP202BS

#### At the end of this course each student should be able to:

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Identify the fundamental concepts on Quantum behavior of matter in its micro state.	L4
CO2	Analyze fundamentals of Semiconductor Physics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO3	Predict fundamentals of Opto electronics, lasers and fiber optics and apply to various systems like communications, solar cell, photo cells and so on.	L3
CO4	Design and prepare new materials for various engineering applications.	L5
CO5	Describe the phenomena of electromagnetism, magnetic materials and dielectric materials.	L2

# **Course Name: Programming for Problem Solving**

#### **Course Code: CS103ES**

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#### At the end of this course each student should be able to:

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S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Describe basics of computer system, algorithms and basics of C language	L2
CO2	Use Arrays, strings, structures, pointers to develop programs	L3
CO3	Analyze the concept of preprocessing and file handling in C programming	L4
CO4	Express the knowledge in developing structured programs using functions which are used to decompose a problem into different modules, developing programs using recursions and a concept of dynamic memory allocation.	L2,L5
CO5	Identify the searching and sorting algorithms and to convert the algorithms into C programs.	L2

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S. No	Course Outcomes	Bloom's Taxonomy
		Level
	Determine the Natural resources on which the structure of development is	
CO1	raised for sustainability of the society through equitable maintenance	L4
	ofnatural resources	
CO2	Illustrate about biodiversity that raises an appreciation and deeper understanding of species, ecosystems and also the interconnectedness of the living world and thereby avoids the mismanagement, misuse and destruction of biodiversity	L2
CO3	Identification, assessment and quantification of global environmental issues in order to create awareness about the international conventions for mitigating global environmentalproblems	L4
CO4	Develop the raising human needs of the present and future generations through preserving the environment	L5
CO5	Outline green environmental issue provides an opportunity to overcome the current Global environmental issues by implementing modern techniques like CDM, green building, green computing etc. Global environmental issues in order to create awareness	L2

# **Course Name: Engineering Graphics**

### Course Code: ME104ES

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Discuss about section and orthographic views of engineering components	L2
CO2	Draw the projection points ,lines and planes	L5
CO3	Classify solids and projection of solids at different positions	L4
CO4	Show the section views of solids and development of surfaces	L1
CO5	Draw the isometric projection and perspective views of object / solids Apply the concept of drawing in practical application	L5



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S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Examine the usage of different components.	L4
CO2	Construct the electrical circuits.	L5
CO3	Compare the theory and co-relate with experiment	L4
CO4	Recognize the applications of physics experiments in day $-$ to $-$ day life	L4

# **Course Name: Programming for Problem Solving Lab**

#### **Course Code: CS206ES**

S. No	Course Outcomes	Bloom's Taxonomy
		Level
CO1	Formulate the algorithms for simple problems, and translate given algorithms to a working and correct program	L5
CO2	Correct syntax errors as reported by the compilers and identify and correct logical errors encountered during execution	L4
CO3	Represent and manipulate data with arrays, strings and structures use pointers of different types	L1
CO4	Create, read and write to and from simple text and binary files	L5



YEAR: II

Semester: I

**Regulation: R18** 

**Course Code: CS302PC** 

# **Course Name: Data Structures**

#### At the end of this course each student should be able to:

CO1	Define the basic data structures and its operations on stack and queue.	L1
CO2	Discuss the various dictionaries, representations and operations, analyzing the hash table representation.	L2
CO3	Analyze the different search trees and its operations using examples.	L4
CO4	Demonstrate the implementation and traversal methods of graphs and different sorting techniques.	L3
CO5	Design the different pattern matching algorithms and tries.	L5

# **Course Name: Computer Oriented Statistical Methods**

**Course Code: MA303BS** 

CO1	Define the basics concepts of probability an distributions using sample	L1
	examples.	
CO2	Calculate the mathematical expectations and discrete probability	L4
	distributions.	
CO3	Evaluate the concept of Continuous Probability Distributions, Fundamental	L4
	Sampling theory on Distributions and its theorems.	
CO4	Illustrate the Estimation & Tests of Hypotheses on statistics and Statistical	L2
	Hypotheses concepts.	
CO5	Analyzing the concepts of Stochastic Processes and Markov Chains.	L4
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CO1	Define the basics of instructions sets and their impact on	L1
	processor design	
CO2	Demonstrate the role of functional parts of a computer system, the	L3
	purpose of control unit, different instruction sets formats and addressing	
	modes.	
CO3	Develop the basics of computer arithmetic and its operations are performed	L5
	on different data types like floating point and decimal point operations	
CO4	Analyze the hardware parts of a computer system and its operations and	L5
	understanding the hierarchy of memory organization.	
CO5	Explain the different instruction sets and pipeline techniques, the purpose of	L4
	multi processors and its intercommunication process.	

# **Course name: Object Oriented Programming using C++**

Course Code: CS305PC

CO1	State the OOPS concepts, implementations, and syntax and	L1
	Constructing simple programs.	
CO2	Describe the creation, structure, implementation of Classes, objects and data	L2
	abstraction.	
CO3	Analyze the inheritance concepts, its rules and implementation and	L4
	understanding the virtual functions its usage and concept of polymorphism	
	using simple programs.	
CO4	Estimate the formatted IO and Unformatted IO and error handling in file	L3
	operations.	
CO5	Develop the concept exception and Handling the exceptions during the	L5
	programming.	



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<i>C</i> O1	Determine the different characteristics of components like Diodes, BJTs	L4
	and FETs and also knowing their applications	
CO2	Define the utilization of BJTs, Designing and analyzing small signal	L1
	amplifier circuits.	
CO3	Explain the Postulates of Boolean algebra and to minimize combinational	L2
	functions. Knowing the logic families and realization of logic gates.	
CO4	Design and analyze combinational logic circuits and its implementation	L5
	using logic gates.	
CO5	Analyze the sequential logic circuits, understanding the need of	L4
	counters and registers and basics of RAM and ROM	

# Course Name: Analog and Digital Electronics Lab

**Course Code: CS306ES** 

<i>CO</i> 1	Demonstrate the design and test rectifiers with filters	L3
CO2	Develop the construction and test amplifier circuits and interpret the results.	L5
CO3	Evaluates the postulates of the Boolean Algebra to minimize the Combinational circuits	L4
CO4	Analyze Combinational and Sequential circuits and verify the functionality.	L4
CO5	Design the logic gates using different Logic families and verify the functionality.	L5



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CO1	Calculate the importance of structure and Abstract data type, and their basic usability in different applications.	L4
CO2	Design the linear and non-linear data structures using linked lists.	L5
CO3	Discuss various data structures such as stacks, queues, trees, graphs etc. to solve various computing problems.	L2
CO4	Explain the various kinds of searching and sorting techniques, and decide when to choose which technique.	L2
CO5	Identify and use a suitable data structure and algorithm to solve a real world problem.	L2

# Course Name: IT Workshop Lab

# Course Code: CS308PC

#### At the end of this course each student should be able to:

CO1	Apply knowledge for computer assembling and software installation and	
	solvetrouble shooting problems	L3
CO2	Discuss use of internet and World Wide Web	L2
CO3	Analyze use of internet, www and web browsers	L4
CO4	Determine the tools for documentation	L4
CO5	Design the tools for ppt, Budget sheet etc	L5

# Course Name: C++ Programming Lab

# Course Code: CS309PC

CO1	Explain polymorphism and develop C++ programs	L2
CO2	Develop C++ programs with reusability concept.	L5
CO3	Compare classes & structures and develop C++ programs using classes	L4
	&	
	Structures	
CO4	Develop C++ programs to handle exceptions in programming	L5
CO5	Determine different type of problems using object-oriented programming	L4
	Techniques	





# YEAR: II

Semester: II

**Regulation: R18** 

# Course Name: Business Economics & Financial Analysis

Course Code: SM402MS

#### At the end of this course each student should be able to:

CO1	Explain the various forms of business and impact of economics on	L2
	business.	
CO2	Define demand and supply analysis which includes elasticity of demand and supply analysis	L2
CO3	Determine the various factors of production, cost, market structures and pricing.	L3
CO4	Examine the knowledge on financial accounting.	L4
CO5	Analyze the knowledge on financial analysis through ratios.	L4

# **Course Name: Operating Systems**

#### Course Code: CS403PC

# At the end of this course each student should be able to:

CO1	Discuss the concepts of operating systems, real time systems, and	L2
	distributedsystems.	
CO2	Analyze on process, CPU scheduling and system calls.	L4
CO3	Evaluate the concept of deadlocks, process management, and	L4
	synchronization and inter process communications.	
CO4	Develop memory management and virtual memory concepts.	L5
CO5	Design files systems implementations and operations.	L5

Course Name: Database Management System

#### **Course Code: CS404PC**

CO1	Explain database system applications and database design	L2
CO2	Determine relational model, views and relational algebra	L4
CO3	Develop SQL queries, schema refinement	L5
CO4	Demonstrate the concepts on transaction management	L3
CO5	Evaluate file organization and indexing.	L4





# **Course Name: JAVA**

#### **Course Code: CS405PC**

#### At the end of this course each student should be able to:

CO1	Solve the real world problems using object oriented programming	L4
	techniques.	
CO2	Explain the packages and access protections, IO streams	L2
CO3	Analyze the fundamentals of exceptions and its handling mechanism in	L4
	java. To understand multithreading programs and thread synchronization.	
CO4	Define the java collections framework. And how to use the collection	L1
	classes.	
CO5	Develop the graphical user interface creation using java & to understand the	L5
	various components of GUI programming in java.	

# **Course Name: Discrete Mathematics**

# Course Code: CS401PC

# At the end of this course each student should be able to:

<i>C</i> 01	Define mathematical logics and proofs.	L1
CO2	Discuss practice sets, functions and relations and theirrepresentations.	L2
CO3	Calculate complexity of algorithms, structural induction and recursions.	L4
CO4	Determine discrete probability and accounting techniques	L4
CO5	Develop trees and graphs.	L5

# Course Name: Operating Systems Lab

# Course Code: CS406PC

CO1	Discuss about different CPU scheduling algorithms using C-language	L2
CO2	Solve c programs for different file allocation and file organization techniques	L4
<u>CO2</u>	Develop a programs for various memory allocation strategies like MVT	Ι5
03	and MFT	LJ
CO4	Construct c programs for prevention and avoidance of deadlocks	L5
CO5	Develop c programs for paging technique and page replacement Algorithms	L5





# Course Name: Database Management Systems Lab

**Course Code: CS407PC** 

# At the end of this course each student should be able to:

CO1	Identify appropriate database schema for a given problem	L2
CO2	Design an E-R model for real world problem	L5
CO3	Develop relational model for schema refinement	L5
CO4	Construct a database for roadway travels and formulate quires using	L5
	DDl, DMl, DCL commands	
CO5	Develop triggers, cursors for given problem	L5

# Course Name: Java Programming Lab

Course Code: CS408PC

# At the end of this course each student should be able to:

CO1	Apply OOP in problem solving and develop basic programs.	L3
CO2	Develop basic programs on multithreading and exception handling	L5
CO3	Design code for accessing the information from files	L5
CO4	Construct code for data structures and sorting techniques	L5
CO5	Discuss GUI based applications using swings and applets	L2



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PRINCIPAL Scient Institute of Technology YEAR: III

Semester: I

**Regulation: R18** 

# **Course Name: Software Engineering**

# Course Code: CS502PC

# At the end of this course each student should be able to:

	Ability to translate end-user requirements into system and software requirements, using e.g.	
CO1	UML, and structure the requirements in a Software Requirements Document	L3
CO2	Identify and apply appropriate software architectures and patterns to carry out high level	L3
	design of a system.	
CO3	Critically compare alternative choices of software architectures.	L4
CO4	Experience and/or awareness of testing problems.	L3
CO5	Develop a simple testing report.	L4

# Course name: Formal languages and automata theory

# Course Code: CS501PC

CO1	Understand the concept of abstract machines and their power to recognize the languages	L2
CO2	Employ finite state machines for modeling and solving computing problems	L3
CO3	Design context free grammars for formal languages	L6
CO4	Distinguish between decidability and undesirability	L4
CO5	Gain proficiency with mathematical tools and formal methods	L4,L5



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#### **Course Name: COMPUTER NETWORKS**

# **Course Code: CS503PC**

#### At the end of this course each student should be able to:

CO1	Gain the knowledge of the basic computer network technology.	L4
CO2	Acquire knowledge of the functions of each layer in the OSI and TCP/IP reference model.	L3
CO3	Obtain the skills of subnetting and routing mechanisms.	L4
CO4	Apply essential protocols of computer networks in network design and implementation.	L3
CO5	Utilization of protocols in Electronic Mail.	L2,L3

# **Course Name: WEB TECHNOLOGIES**

# **Course Code: CS504PC**

# At the end of this course each student should be able to:

CO1	Gain knowledge of client-side scripting, validation of forms and AJAX programming	L2
CO2	Understand server-side scripting with PHP language	L3
CO3	Understand what is XML and how to parse and use XML Data with Java.	L2
CO4	To introduce Server-side programming with Java Servlets and JSP.	L3
CO5	Define the usage of client side scripting and its importance	L2



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\* mbby the R. D1  Course Name: Principles of Programming Language

#### Course Code: CS515PE

At the end of this course each student should be able to:

<i>CO</i> 1	List out the different paradigms of different programming languages,	
	syntax and semantics, the evolution of programming languages	L1
CO2	Explain the concepts of OO languages, functional languages, logical and	
	scripting languages.	L2
CO3	Discuss the principles and techniques involved in design and implementation	L2
	of modern programming languages.	
CO4	Design issues of different programming languages and the concepts of	L5
	concurrency control and exception handling.	
CO5	Identify different language paradigms and evaluate their relative benefits.	L2

# Course Name: INFORMATION RETRIEVAL SYSTEMS Course Code: CS523PE

CO1	Understanding Information Retrieval System, its objectives and Functional overview of it.	L1,L2
CO2	To learn how cataloging and indexing is performed and data	L1,L2,
	Structures to store and its easy retrieval.	L3
CO3	Analyzing how automatic indexing is performed using statistics,	L2
	Probability and various clustering techniques.	
CO4	Ability to learn techniques to implement user search and information	L1,L2
	Visualization.	
CO5	Understanding various hardware and software techniques to search	L1,L2,
	the text and retrieval of multimedia information.	L3



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# Course Name: Computer networks and web technologies lab

**Course Code: CS506PC** 

At the end of this course each student should be able to:

CO1	Implement data link layer farming methods	L2
CO2	Analyze error detection and error correction codes.	L3
CO3	Implement and analyze routing and congestion issues in network design.	L4
CO4	Implement Encoding and Decoding techniques used in presentation layer	L3
CO5	To be able to work with different network tools	L2

# Course Name: Software Engineering Lab

# Course Code: CS505PC

#### At the end of this course each student should be able to:

CO1	Define software engineering process life cycle.	L1
CO2	Analyze and specify software requirements.	L4
CO3	Design and translate a specification into a design.	L5
CO4	Determine Built an SRS documents :Realize design practically,	L3
	using an appropriate software engineering	
CO5	Develop prototype model for a given case study using modern	L5
	engineering tools.	



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# Course name: Advanced Communication Skills Lab Course Code: EN508HS

S. No	Course Outcomes	Bloom's Taxonomy Levels
CO1	Build sound vocabulary and its proper use contextually	L3
CO2	Use of functional English effectively in formal and informal contexts	L4
CO3	Develop effective speaking skills and Maximize job prospects	L5
CO4	Plan and make different forms of presentation using various techniques	L2
CO5	Understand an effective speaking skills and Maximize job prospects.	L2,L3



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# YEAR: III

# Semester: II

**Regulation: R18** 

# **Course Name: MACHINE LEARNING**

# **Course Code: CS601PC**

# At the end of this course each student should be able to:

CO1	This course explains machine learning techniques such as decision tree learning,	L2
	Bayesian learning etc.	
CO2	To understand computational learning theory.	L2
CO3	To study the pattern comparison techniques.	L2
CO4	To study about unsupervised learning techniques instance based ,experience based algorithms.	L1
CO5	Course explains Artificial neural networks.	L1

# **Course Name: Compiler design**

# Course Code: CS602PC

CO1	Define the language processors, structure of the compiler and lexical	L1
	analysis.	
CO2	Discuss the context free grammar and its syntax. And ability to understand	L2
	and design the parsers.	
CO3	Evaluate the syntax directed translation and intermediate code generation	L4
	procedure.	
CO4	Analyze the runtime environments and memory management. And identifying	L4
	the design issues in the code generator.	
CO5	Determine the sources of optimization, data flow analysis and redundancy	L4
	elimination.	



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<i>CO1</i>	Explain the basics of algorithm and ability to analyze the performances of	L2
	different algorithms and searching and sorting algorithms.	
CO2	Identify appropriate algorithm design techniques for solving the problems.	L2
CO3	Discuss the choice of data structures and the algorithm design methods impact	L2
	the overall performance of programs.	
CO4	Analyze and Understanding how to solve the problems using the dynamic	L4
	programming by dividing it into sub problems.	
CO5	Examine the problems of optimization and solving using the algorithms.	L4

# Course Name: Software testing methodologies

# Course Code: CS615PE

# At the end of this course each student should be able to:

CO1	Explain the intelligent systems and fundamentals of AI and problem solving techniques elimination.	L2
CO2	Discuss about logic concepts and logic programming and approaches to knowledge representation.	L2
CO3	Design phases in building expert systems and applications of expert systems and finding uncertainty measures.	L5
CO4	Develop the machine learning and artificial neural networks and its design issues.	L5
CO5	Determine advanced knowledge representation techniques and exploring case study. And understand the natural language processing.	L4

#### **Course Name: Non-conventional energy sources**

# Course Code:MT96010E

CO1	Demonstrate the generation of electricity from various Non-Conventional sources of energy,	L2
	have a working knowledge on types of fuel cells.	
CO2	Estimate the solar energy, Utilization of it, Principles involved in solar energy collection and	L1
	conversion of it to electricity generation	
CO3	Explore the concepts involved in wind energy conversion system by studying its	L2
	components, types and performance.	
CO4	Illustrate ocean energy and explain the operational methods of their utilization.	L2
CO5	Acquire the knowledge on Geothermal energy on cryptography and security models.	L4
1		



# **Course Name: MACHINE LEARNING LAB** At the end of this course each student should be able to:

CO1	understand complexity of Machine Learning algorithms and their limitations;	L1
CO2	Understand modern notions in data analysis-oriented computing;	L2
CO3	Be capable of confidently applying common Machine Learning algorithms in practice and	L1,
	implementing their own;	L2
CO4	Be capable of performing experiments in Machine Learning using real-world data.	L4

#### Course Name: COMPILER DESIGN LAB

#### Course Code: CS605PC

#### At the end of this course each student should be able to:

CO1	Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript	L1,
	and XML	L2
CO2	Apply client-server principles to develop scalable and enterprise web applications.	L2
CO3	Ability to design, develop, and implement a compiler for any language.	L2
CO4	Able to use lex and yacc tools for developing a scanner and a parser.	L3
CO5	Able to design and implement LL and LR parsers.	L1,
		L2

# Course Name: Software testing methodologies Lab

#### Course Code: CS625PE

## At the end of this course each student should be able to:

CO1	Design and develop the best test strategies in accordance to the development model.	L1
CO2	Well developed knowledge in comparing the various testing strategies as well.	L2
CO3	Know the basic techniques for deriving test cases	L3
CO4	Able to test a domain or an application and identifying the nice and ugly domains.	L1,L
		2
CO5	Apply appropriate software testing tools, techniques and methods for even more effective systems during both the test planning and test execution phases of a software development	L2
	project	



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#### YEAR: IV Semester:

**Course Name: Block Chain** 

At the end of this course each student should be able to:

CO1	Define block chain systems work.	L1
CO2	Discuss about Block chain Environment.	L2
CO3	Design, build, and deploy smart contracts and distributed applications.	L5
CO4	Identify the concepts of currency.	L2
CO5	Develop the concept of Integrate ideas from block chain technology into their own projects	L5

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# **Course Name: Data Mining**

# Course Code: CS702PC

# At the end of this course each student should be able to:

CO1	Ability to understand the types of the data to be mined and present a general classification of	L2
	tasks and primitives to integrate a data mining system.	
CO2	Apply preprocessing methods for any given raw data.	L4
CO3	Extract interesting patterns from large amounts of data.	L3
CO4	Discover the role played by data mining in various fields.	L2
CO5	Choose and employ suitable data mining algorithms to build analytical applications	L3

# Course Name: Software process & project management Course Code: CS725PE

# At the end of this course each student should be able to:

CO1	Gain knowledge of software economics, phases in the life cycle of software development,	L2
	project organization, project control and process instrumentation.	
CO2	Analyze the major and minor milestones, artifacts and metrics from management and technical	L3
	perspective	
CO3	Design and develop software product using conventional and modern principles of software	L4
	project management	
CO4	Understanding the specific roles within a software organization as related to project and	L1,L
	process management	2
CO5	Describe the principles, techniques, methods & tools for model-based management of software	L1,L
	projects	2





Course Code: CS743PE

**Course Code: CS701PC** 

# At the end of this course each student should be able to:

CO1	Student will be able to understand basic cryptographic algorithms, message and web	L2
	authentication and security issues.	
CO2	Ability to identify information system requirements for both of them such as client and server.	L4
CO3	Ability to understand the current legal issues towards information security.	L5
CO4	Discuss the message authentication methods and hash factions along with key	L2
	management and distributions.	
CO5	Determine the electronic mail security methods and exploring the case studieson	L4
	cryptography and security models.	

# Course Name: ARTIFICIAL INTELLIGENCE

# Course Code: CS713PE

CO1	Ability to formulate an efficient problem space for a problem expressed in natural language.	L2
CO2	Select a search algorithm for a problem and estimate its time and space complexities	L4
CO3	Possess the skill for representing knowledge using the appropriate technique for a given problem.	L3
CO4	Possess the ability to apply AI techniques to solve problems of game playing, and machine learning.	L4
CO5	Understand the applications of AI, namely game playing, theorem proving, and machine learning.	L1 ,12

CO1	Classify the types of intellectual property, importance of intellectual property	L4
	rights.	
CO2	Identify the Purpose and function of trademark, selecting, and evaluating trade	L2
	mark and its registration processes.	
CO3	Discuss the fundamental of copy right law and law of patents.	L2
CO4	Determine the Trade secrete law, determination of trade secrete status, unfair	L4
	competition.	
005	Identify the new development of intellectual property and international	L2
COS	overview on intellectual property, and development in trade secrets law.	

# Course Name: Cryptography and Network Security Lab

#### **Course Code: CS703PC**

# At the end of this course each student should be able to:

CO1	Develop simple XOR operation for encryption of data	L5
CO2	Explain the use of C/Java to implement Symmetric cryptography	L2
CO3	Select C/Java to develop Asymmetric cryptography	L4
CO4	Design Diffie-Hellman Key exchange using HTML and Javascript.	L5
CO5	Construct java programs on MD-5 and SHA-1 algorithms	L5



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# Course Name: Industry Oriented Mini Project

#### **Course Code: CS706PC**

At the end of this course each student should be able to:

CO1	Identify and define problems in the area of Computer science	L2
CO2	Explain and illustrate their practical skills needed tounderstand and modify problems related to programming and designing.	L2
CO3	Apply current technologies and develop applications for the problems.	L3
CO4	Plan to practice as teams on multidisciplinary projects with effective writing and communication skills.	L5
CO5	Apply the engineering and management principles to achieve the goal of the project.	L3

#### Course Name: Seminar

#### Course Code: CS705PC

# At the end of this course each student should be able to:

CO1	Determine recall existing technologies in the area of computer science	L4
CO2	Describe, compare and evaluate different technologies	L2
CO3	Define the area of interest	L1
CO4	Develop their communication skills	L5
CO5	Express technical reports.	L2



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# YEAR: IV

#### Semester: II

**Regulation: R18** 

# Course Name: ORGANIZATIONAL BEHAVIOUR

#### At the end of this course each student should be able to:

CO1	To understand the various attitude and personalities and perceptions and leadership and motivation and apply in organizational situations
CO2	To evaluate the management and contribution of management thinkers
CO3	To apply the relevance of environmental scanning ,planning and to take decisions
CO4	To interpret the individual and interpersonal behavior process for team building and group behavior development
CO5	To analyze the organizing and controlling

# **Course Name: Distributed Systems**

#### Course Code: CS812PE

# At the end of this course each student should be able to:

CO1	Ability to understand Transactions and Concurrency control.	L5
CO2	Understanding Distributed shared memory	L5
CO3	Ability to design distributed systems for basic level applications.	L2
CO4	Analyze what and why a distributed system is.	L4
CO5	Ability to understand Security issues.	L4



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# Course Code: SM801MS

# Course Name: TOTAL QUALITY MANAGEMENT

#### Course Code: MT802OE

#### At the end of this course each student should be able to:

CO1	Understand the concept of quality in the performance of business and various ways of controlling quality in products and services.
CO2	Recognize various quality related aspects to maintain the benchmarking standards in the organization which lead to the customer satisfaction.
CO3	Organize the various quality circles for effective implementation of quality in products and services.
CO4	Define the methodology of cost of quality and use of quality cost information for quality management.
CO5	Assess and compare the quality levels existed at the organization and its outfit to the ISO Standards.

# Course Name: Major Project

# Course Code: CS802PC

CO1	Identify and define problems in the area of Computer science	L2
CO2	Explain and illustrate their practical skills needed tounderstand and modify problems related to programming and designing	L2
CO3	Apply current technologies and develop applications for the problems.	L3
CO4	Analyze as teams on multidisciplinary projects with effective writing and communication skills.	L4
CO5	Plan the engineering and management principles to achieve the goal of theproject	L5



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