

B. Tech Computer Science Engineering

Software Engineers, have played a vital role in contributing to the betterment of humanity and in shaping the world by creating, developing, organizing and managing complex technologies. The growing influence of ever changing technology on all functions of society has created a good demand of software engineers. The Programmes in Computer Science and Information Technology are designed for students seeking an in depth knowledge of hardware, software and theoretical aspects of high-speed computing devices, and with the application of these devices to scientific, technological and business problems. The courses are designed to equip students for professional careers within the computer industry; particularly those who wish to gain employment in international IT companies.

Eligibility Criteria: 10+2(PCM) or equivalent in any stream

To earn a B.Tech in Computer Science Engineering a student has to earn a minimum of 180 credits. Min 100 credits to be earned from science subjects, minimum 40 credits to be earned from Computer Science Engineering subjects and remaining can be taken from any stream

Every student has to attain a minimum of D grade in all courses; a student may however, and repeat or change any course being offered. Notwithstanding, every student must acquire the desired number of credits. The detailed course structure under different categories is given in succeeding pages. Brief description of the course content follows thereafter.

Code	Subject	Credits
3.101	Mathematics I	4
3.102	English Communication I	4
3.103	Engineering Chemistry	4
3.104	Engineering Mechanics	4
3.105	Elements of Electrical Engineering	4
3.106	Elements of Civil Engineering	4
3.107	Mathematics II	4
3.108	English Communication II	4
3.109	Engineering Physics	4
3.110	Programming in C	4
3.111	Elements of Mechanical Engineering	4
3.112	Engineering Graphics	4
3.113	Environmental Studies	4
3.201	Mathematics III	4
3.202	English Communication III	4
3.203	Basic Electronics	4
3.204	Digital Logic Design	4
3.205	Data and File Structure	4
3.206	Database Management System	4
3.207	Business Information Systems	4
3.208	Mathematics IV	4
3.209	English Communication IV	4
3.210	Principles of Business Management	4
3.211	Operating System	4
3.212	Computer Organization And Architecture	4
3.213	Object Oriented Programming With C++	4
3.214	Object Oriented Analysis And Design	4
3.301	Microprocessor & Microcontroller	4
3.302	Computer Network	4
3.303	Web Technology	4
3.304	Object Oriented Programming with Java	4
3.305	Design and Analysis of Algorithms	4
3.306	Web Administration & Operating System	4
3.307	Computer Graphics	4
3.308	Computer Network & Security	4
3.309	Object Oriented Software Engineering	4

3.310	VLSI & Embedded System	4
3.311	Compiler Design	4
3.312	Advance Microsoft Technology	4
3.401	Advance Java	4
3.402	Parallel Processing	4
3.403	Wireless Communication and Mobile Computing	4
3.404	Distributed System	4
3.405	Theory of Computation	4
3.421	Enterprise Resource Planning	4
3.422	Linux Programming System	4
3.423	E Commerce & E Business	4
3.445	Project I	4
3.446	Project II	4
3.447	Project III	4

3.101 Mathematics –I

Credit: 4

Content: Successive differentiation, Expansion of functions, Partial differentiation, Jacobian, Application of partial differentiation Matrix Eigen values And Eigen Vector

3.102 English Communication I

Credit: 4

This course is designed for the students of Engineering and Technology who need English for specific purposes in specific situations. It aims at imparting the communication skills that are needed in their academic and professional pursuits. This is achieved through an amalgamation of traditional lecture, oriented approach of teaching with the task based skill oriented methodology of learning.

Content: English Grammar Fundamentals, Reading & Comprehension, Framing Sentences and Vocabulary, Positive Outlook and Attitude, Spoken English Skills and Body Language

3.103 Engineering Chemistry

Credit: 4

This subject helps in developing problem-solving skills related to the nature of matter, chemical reactions, stoichiometry, energy transformations, atomic and molecular structure, quantum theory, chemical bonding, and periodic properties.

Content: Thermodynamics, concept of Entropy, Phase-Rule – Terminology, Water & its treatment, Corrosion and its prevention – Galvanic & concentration cell, Lubrication and Lubricants - Friction, mechanism of lubrication, Introduction to polymeric composites, polymerization, various types of polymerization, Analytical Methods - Thermal methods.

3.104 Engineering Mechanics

Credit: 4

Content: Basic Concepts Force System and Equilibrium, Definition of Force, Moment and Couple, Principle of Transmissibility, Varignon's theorem, Resultant of force system Condition of static equilibrium for coplanar force system, stability of equilibrium, concept of free body diagrams, Static dry friction, simple contact friction problems, ladders, wedges, screws and belt friction, moment of inertia first moment of inertia, second moment of inertia and product moment of inertia, polar moment of inertia, radius of gyration, mass moment of inertia, Kinematics and Kinetics of Particles, work- Energy equation, Impulse – momentum, Impact – Direct central impact and oblique central impact, Kinematics and Kinetics of Rigid bodies, Plane motion,

3.105 Elements of Electrical Engineering

Credit: 4

This subject will teach high reliability soldering, desoldering, circuitry repair, plated-thru-hole repairs, conformal coating removal, industry standards, electrostatic discharge (ESD) control, surface mount device (SMD) installation, removal and replacement using hand held systems or reflow workstations. Students will solder highly reliable connections; solder to industry standards; desolder connections; install surface mount

devices; remove surface mount devices; remove conformal coatings; repair and/or replace traces, pads, and eyelets.

Content: D.C. Circuits, Nodal and Loop methods of analysis, A.C. Circuits, Transient response of RL, RC and RLC Circuits with step input, Network Theorems, Star to Delta & Delta to Star transformation, Series and parallel A.C. circuits, Three Phase Circuits, Principle, construction & working of transformer, Introduction to. D.C. Machines, Induction motor, Synchronous machines, Measuring Instruments, Voltmeter, Ammeter, Watt meter, Energy meter.

3.106 Elements of Civil Engineering

Credit: 4

Content: Buildings-Definition-Classification according to NBC-plinth area, Floor area, carpet area, floor space index, Buildings- Various Components and their functions, Surveying-classification, general principles of surveying – Basic terms and definitions of chain, compass and leveling surveying, Internal and external combustion systems, Solar thermal systems – Solar photovoltaic – Solar pond – wind, wave, tidal, geothermal and ocean thermal energy conversion systems, Elements of arc and gas welding, brazing and soldering.

3.107 Mathematics II

Credit: 4

Review of the maxima & minima, point of inflexion, Asymptotes, Curve Tracing, Gamma Function & Beta Function Double and triple integral, Differential of Vector, Integration of Vector

3.108 English Communication II

Credit: 4

English Grammar Fundamentals Ii, Reading & Comprehension II, Vocabulary Building, Confidence Building And Etiquettes, Self Management

3.109 Engineering Physics

Credit: 4

It is designed to enable students to appreciate the role of physics in today's society and technology. Emphasis on the fundamental laws of nature on which all science is based, with some examples of interest to biologists.

Content: Interference, Division, Diffraction, dispersive and resolving powers. Polarization, Simple concepts of photo elasticity. Spontaneous and stimulated emissions, Laser action, Propagation of light in fibers, Simple concepts of Harmonic Oscillator, resonance; quality factor, E.M. wave theory ,dielectric coefficient permittivity, Special Theory of relativity, Nuclear physics.

3.110 Programming in C

Credit: 4

Content: This Subject provides an introduction to computer programming and to software development. The first portion of the course introduces students to computer programming, using the C/C++ language, and covers fundamental topics such as flow of

control, function definition, data structures, and object-oriented design and programming. The second portion of the course provides a more holistic view of software development and introduces students to a selection of tools, and additional languages that programmers should be proficient in to become effective software developers, with an emphasis on the Python programming language. Topics in this portion include using build tools, third-party libraries, scripting languages, and data storage.

Content: An Overview of Computer System, Operating System Basics, Introduction to the basic concepts of Networks and Data Communications, Programming Languages, C Programming language, Settings, Standard library

3.111 Elements of Mechanical Engineering

Credit: 4

Traditionally, engineering education tries to balance the fundamentals that engineers will need during their career and the skills that they need to start functioning as engineers upon graduation. The dynamic nature of the engineering enterprise makes it impossible and unwise to attempt to teach our students everything they need to know to function during their career. To restate the obvious, their education should include a strong set of fundamentals and the recognition of the need for and the ability to continually learn.

Content: Properties of Steam & Boilers, Steam Turbines and Condensers, Classification, principles, types, compounding of turbine, I.C. Engines and Gas Turbines, Water Turbines, Pumps and Hydraulic Devices, Simple Lifting Machines, Power Transmission Methods and Devices, Stresses and Strains, Bending Moment & Shear Force

3.112 Engineering. Graphics

Credit: 4

Content: This subject is an introduction to engineering design and the related graphical tools used to communicate design concepts. Engineering design require a combination of organization, analysis, and communication skills. Engineering graphics is the primary medium for communicating design concepts and is an important tool for analyzing engineering problems. This subject aims at developing the skills needed for documenting designs using drawings and for performing graphical analysis of two dimensional and three dimensional problems. Manual and computer aided methods of graphical analysis and communication are covered. Topics include the following: visual thinking, engineering design, free-hand sketching, projection theory, pictorial sketching, solid modeling, engineering drawing standards, tolerancing, plotting, and computer-aided design.

3.113 Environmental Studies

Credit: 4

Introduction to Environment, Ecology and Ecosystem, Ecology & Ecosystems, Environmental Pollution, Population & Natural Resources,

3.201 Mathematics III

Credit: 4

First order ODE: Methods for solving them, homogeneous equations, exactness, methods for finding integrating factors, Linear and Bernoulli's equation, Linear differential

equations of nth order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solution of second order differential equation by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation), Series Solution and Special Functions, Laplace Transform, Periodic functions, Trigonometric series, Fourier series of period 2π , Euler's formulae, Functions having arbitrary period, Change of interval, Even and odd functions, Half range sine and cosine series

3.202 English Communication III

Credit: 4

Advanced Grammar I, Interview Management I, English Literature Prose, Self Improvement, Business Communication

3.203 Basic Electronics

Credit: 4

Content: Electronics engineering, or electronic engineering, is an engineering discipline where non-linear and active electrical components such as electron tubes, and semiconductor devices, especially transistors, diodes and integrated circuits, are utilized to design electronic circuits, devices and systems, typically also including passive electrical components and based on printed circuit boards. The term denotes a broad engineering field that covers important subfields such as analog electronics, digital electronics, consumer electronics, embedded systems and power electronics. Electronics engineering deals with implementation of applications, principles and algorithms developed within many related fields, for example solid-state physics, radio engineering, telecommunications, control systems, signal processing, systems engineering, computer engineering, instrumentation engineering, electric power control, robotics, and many others.

3.204 Digital Logic Design

Credit: 4

Binary Number System, Review of Boolean algebra and Logic gates, Combinational Logic Design, Sequential Logic Design, Registers, Counters and the Memory unit, Logic Families and Semiconductor Memories, Processor Logic Design, Introduction, Processor organization, Arithmetic logic unit, Design of ALU, Status register, design of shifter, Processor subject and Design of accumulator, Control Logic Design

3.205 Data and File Structure

Credit: 4

This subject leads to understand the Stacking, Queuing to go for Arrays and single linked lists. It leads to learn relevant applications of data and file structure

Content: ADTs: introduction to ADTs, using simple examples, e.g. Stacks, queues
Implementation: description of how different data structures can implement the same ADT, e.g. Arrays and single linked lists, context, algorithms for data structures, code implementations, applications, use of data structures, evaluation, estimation of disk/

memory requirements, evaluations of data structures, dynamic algorithms, binomial coefficient, Graphs, overview.

3.206 Database Management Systems

Credit: 4

This subject gives the idea of complete entity relation diagram and entity analysis technique and development of first, second and third normal forms. This gives further idea of design implementation and data manipulation to go for optimization technique.

Content: Data modelling, relational model, bottom up analysis, implementation a design, data manipulation, query and reporting concurrency recovery, optimization technique, expression transformation, restrictions and projections, distributivity, commutativity, and associativity, Boolean expressions, semantic transformations, database statistics, divide and conquer strategy, index lookup, merge, hash lookup.

3.207 Business Information Systems

Credit: 4

This course introduces students to role of information systems in business. The subject builds a basic understanding of the value and uses of information technology in information systems for business operations, managerial decision-making and strategic advantage.

Content: Information systems in business End-user computing and business telecommunications, Introduction to business telecommunications, Various Functional area Information Systems, Transaction processing, Data entry process, Batch processing Real- Time processing, Database maintenance, Information Systems for managerial decision support, Information Systems for managerial decision support.

3.208 Mathematics IV

Credit: 4

Function of Complex variable, Complex Integration, Zeroes of transcendental and polynomial equation using Bisection method, Rate of Interpolation: Finite differences, difference tables, Newton's forward interpolation & it's problems, Newton's backward interpolation & it's problems, Newton's divided difference formula for unequal intervals & it's problems, Lagrange's divided difference formula for unequal intervals & it's problems, Numerical integration: Trapezoidal method & it's problems method, Simpson's one third and three-eight rules & problem based on Simpson's one third and three-eight rules. Numerical Differentiation: Solution of ordinary differential equations by following methods: Euler's Method, Picard's Method and forth-order Runge- Kutta methods & it's problems

3.209 English Communication IV

Credit: 4

Interview Management II, Presentation Skills, Writing Skills And Spoken English, Personal Development, English Literature Prose – Novel

3.210 Principles of Business Management

This subject introduces basic management concepts, theories, and their application, and offers an overview of managerial concerns arising in modern organizations.

Content: Management: Definitions, Significance of management, Management and administration, Principles of Management, Evolution of management/various schools of thought, Pre-Scientific Management Era, Classical Management Era, Neo-Classical Management Era, Modern Management Era, Recent developments in management, Fundamentals of Planning, Steps of Planning, Forecasting and planning, Elements of Planning, Decision Making, functions of management, forecasting- definition, types, scheduling, organizing, staffing, Directing, Controlling, Leadership.

3.211 Operating System

Credit: 4

Through this subject we get the Basic Concepts and Terminology, Memory Management function, Processor Management Function, device and information Management Function.

Content: Importance of Operating Systems, Basic Concepts and Terminology, An Operating System Resource Manager: Memory Management Functions, Processor Management Functions, Device Management Functions, Information Management Functions, Process Management, job scheduler, operation process, threads, CPU scheduling, scheduling algorithm, evaluation, synchronization, semaphores, monitors and atomic and dead locks, memory management, vertical memory, file concept, directory, protection, allocation, free space management, I/O applications.

3.212 Computer Organisation & Architecture

Credit: 4

The subject outlines the fundamental way in which a computer works: starting with simple logic and progressing to a simple model of a microprocessor. This is followed by an appreciation of low-level programming leading to a clear understanding of the key points of machine performance.

Content: Generation of computers, Classification of computers, Organization, Structure and function, Von Neumann architecture, Performance parameters. System bus, Bus Structure, Elements of Bus design, Interrupts, Instruction Cycle state Diagram with interrupts/Without interrupts, Functions of OS, Uniprogramming, Multiprogramming, Time Sharing systems, Internal memory-ROM, PROM, EPROM, Flash memory, External memory-Magnetic memory, RAID, Optical memory, Magnetic Tape, I/O Devices-Function of I/O module, Programmer I/O, Interrupt Driver I/O DMA , External Interface (Serial, Parallel), ALU, Binary Arithmetic, Floating point Arithmetic, Basic combinational and sequential Circuit Design, Instruction sets, Instruction Pipelining, Types of processors, Micro operations, Control subject Implementation-Hardwired, Micro programmed, Overview of parallel Processing.

3.213 Object-Oriented Programming Using C++

Credit: 4

In this subject one has to orient the programming according to the main object and for that one has to study the objects representation of data implementation of the object design the libraries class modification, elements of C++ STL.

Content: Objects, attributes, abstract/ member data, constructors and destructors, inheritance, dynamic binding, virtual functions, polymorphism, their implementations, design strategic, design methods, design refinement, class libraries, class modification, opportunity to use windows, objects, elements of the C++ STL or other class libraries.

3.214 Object-Oriented Analysis and Design

Introduction to Object Oriented Analysis and Design, Introduction to UML, Concept of UML, Basic building blocks of UML, Mechanism in UML, architecture, SDLC, Structural Modeling, Behavior Modeling, Architectural Modeling

3.301 Microprocessor & Microcontroller

Credit: 4

The objective of this course is to give the students the ability to design, build and test a microprocessor-based controller system. Students will learn how a microprocessor works, and programming in assembly language.

Content: Microprocessor-Based Systems, Types of Microprocessor, Applications of Microprocessors, Software Design for a Microprocessor-Based System, Software Coding and Testing for a Microprocessor Based System, Programmable Parallel Interface, Programmable Serial Interface, Non-Programmable Parallel Interface.

3.302 Computer Network

Credit: 4

The aim of this subject is to provide a rigorous introduction to networks, and experience in installing users and software on a network. This subject will clarify the issues associated with network use and how this has developed. It will identify the architectural concepts behind networking and help develop the preliminary skills necessary to install and manage networks.

Content: Benefit of networks-network principles and applications, client-server architectures, review of remote access, starting with e-mail through to intranets and the internet, lans, wans and mans, networked applications, cost/benefit analysis of network use, network architecture concepts: the iso osi 7 layer model (and/or ieee 802), topologies, network design, network software, file and directory attributes, trustee rights, irm (inherited rights management), and setting up security, network hardware and software factors

3.303 Web Technology

Credit: 4

Introduction to WWW, Introduction to HTML, Introduction to PHP, Array, String & Session Handling, MYSQL Database, Design and Analysis of Algorithms

3.304 Object Oriented Programming with Java

Credit: 4

In this subject of programming one can learn the total procedures of Java Programming and its comparison with other high level languages and the importance in the business management. Through this we go for flow control statements and flow braking statements and one has to learn the thread control method and creating of running threads etc.

Content: Object oriented programming, Overview of java, Java programming design, Exception handling and threading in java, Event handling, encapsulation, polymorphism, importance and limitations of java, conditional and loop statements, composition syntax, inheritance syntax, initializing and class loading multithreading and thread control, thread life cycle, synchronization, daemon threads, event driven programming, ignoring, handling, delegating, originating, events.

3.305 Design and Analysis of Algorithms

Credit: 4

This subject gives an understanding of algorithms and design strategies.

Content: Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity, Divide and Conquer, Greedy Method, Dynamic Programming, Back Tracking, Branch and Bound, NP Hard and NP Complete Problems .

3.306 Web Administration & Operating System

Credit: 4

Introduction to windows server 2003, Application & port, Security in IIS, windows server 2008, Understanding the TCP/IP, DNS, IPv4&IPv6 in Windows server 2008

3A.307 Computer Graphics

Credit: 4

This subject teaches us raster and vector graphics, video display, logical input devise and issues facing the developer of graphical systems. Here one can learn the hierarchy of graphic software using graphics API, simple color model homogenous coordinates, viewing transformation and clipping.

Content: Graphical algorithms, line generation algorithms, use of fonts, polynomial curves, polygonal representations, image synthesis, sampling techniques, image enhancement, graphical user-interface design/programming, GUI builders and programming environment, animation and key-frame animation, camera animation, scripting system, motion capture, deformation, articulated structures, sound, video and graphics, design of multimedia systems, tools for multimedia development, virtual reality.

3A.308 Computer Network and Security

Credit: 4

This subject deals with various threats to computer systems arranged in a network and how we can protect the systems from these threats.

Content: Need of Computer Security, Issues Related to Cryptography, Conventional Encryption and Message Confidentiality, Public-Key Cryptography and Message Authentication, Information Security Applications, Electronic Mail Security, IP Security, Web Security, System Security-Intruders, Viruses and Related Threats, Firewalls.

3.309 Object Oriented Software Engineering

Credit: 4

In this subject one has to learn the software processes life cycle models prototype evolutionary and spiral models. Here one has to go through planning, designing, reliability, maintenance and testing finally.

Content: Software processes, water fall, prototype, spiral model, loc, token count, function count, design matrices, data structure, information fall matrices, cost estimation, single and multivariable models, allocation model, risk management, cohesiveness and coupling, function oriented, object oriented design, user interface design, faults, reliability, calender time component, software reengineering, maintenance process, reverse engineering, functional testing, cause effect drafting, debugging, testing tools and standards.

3.3010 VLSI and Embedded System

Credit: 4

This subject aims to introduce the VLSI design methodology for ASIC design. The study of VLSI design and fabrication processes by simple concepts such as stick and symbolic diagrams is carried out rather than going into complex design rules.

Content: Bi-CMOS, NMOS and CMOS, Basic characteristics of MOS transistor, CMOS, scaling down of feature size, ASIC design options, VLSI design flow, Hardware description languages, Commercial issues surrounding VLSI circuit, Analogue and digital mixed-type VLSI system, SOC-system, digital IP cores in SOC, VLSI design processes using CAD tools and FPGA devices.

3.311 Compiler Design

Credit: 4

This subject explains the various phases of the process of compilation and the types of compilers.

Content: One pass compiler and syntax analyser, lexical analysis, parser generator, code generation, run time environments, source language issues, storage organization, storage allocation.

3.312 Advance Microsoft Technology

This subject introduces many different aspects of dynamic Web applications. It includes discussions on creating and configuring controls at run time. It then explains how to build dynamic globalization features into a Web application to ensure that it is localizable, including using localized resources and applying different master page layouts in response to culture and language settings.

Content: Dynamic Control Creation, Localization and Globalization, Dynamic Master Pages, Dynamic Web Configuration

3.401 Advanced Java

Credit: 4

The subject provides the students a comprehensive course in Java programming. The students must be aware of various Object Oriented Programming Concepts before studying this unit.

Content: Object-Oriented Programming, OOPS Concepts, Object-Oriented Concepts In Java, Overview of Java, Java Programming Design, Flow-Control Statements, Reusing Classes, Introduction to Objects, Programming a Graphical User Interface, Building a Simple User Interface, Laying Out a User Interface, Exception Handling and Threading in Java, Event Handling, Networking in Java, Database Connectivity: JDBC.

3.402 Parallel Processing

Credit: 4

This lesson is to go in detail about Parallel Computers, Designing Parallel Programs-Message-Passing Computing and Programming, Embarrassingly Parallel Computations, Partitioning and Divide-and-Conquer Strategies.

Content: Parallel and Distributed Computers, Performance Measures, Message Passing Computing, Analysis of Parallel Programs, Writing Parallel Programs, Parallel Computations, Partitioning and Divide-and-Conquer, Pipelined Computations, Scheduling and Load Balancing, Synchronous Computations, Shared Memory Programming. High Performance Techniques for Modern Serial Processors, High Performance Techniques for Parallel Processors, PARALLEL PROGRAMMING

3.403 Wireless Communication and Mobile Computing

Credit: 4

It is an introductory graduate course that covers a variety of issues pertinent to the design of wireless communication systems. Topics include trunking, propagation, frequency reuse, modulation, coding, and equalization.

Content: Introduction to Wireless Communications, Modern Wireless Communications Systems, The Cellular Concept, Mobile Radio Propagation: Large-Scale Path Loss, Mobile Radio Propagation: Small-Scale Fading, Modulation for Wireless Links, Improving Wireless Link Performance: Equalization, Diversity and Channel Coding, Multiple Access Techniques for Wireless Communications.

3.404 Distributed System

Credit: 4

This subject is to introduce the circuitry and design of electronic circuits used in modern radio communication systems and the analysis of circuit behavior under high frequency operation.

Content: Active and Passive Circuits, Power Amplifiers, L-C, Tapped Capacitor, auto-transformers, Analyze RF Circuits, FM transmission, Waveguide propagation, TE/TM propagation in waveguides, Microwave Frequencies, Matching Networks, Smith chart, Scattering parameters, Matching networks: Introduction to strip line transmission systems, micro strip.

3.405 Theory of Computation

Credit: 4

This subject gives the students the idea about languages, grammars, and automata.

Content: Sets, operations on sets, relations and functions, graphs, trees, proof techniques, bnf notation, bnf examples, expressions in bnf, dfas, ndfas and their implementation, regular expressions, regular grammars, closure and homomorphism, pigeonhole principle, pumping lemma, cfigs, parsing and ambiguity, pushdown automata, npdas and cfigs.

3.421 Enterprise Resource Planning

Content: Review the literature on PPC in the last 5 years, Operation Research applied to production Planning, Simulation Applications, Optimized Production Planning, Group Technology, Computer aided process planning, Advanced Inventory Models, Scheduling survey, Computer integrated manufacturing, Human aspect in production, FMS and Robotics, Enterprise resource planning.

3.422 Linux Programming System

Credit: 4

Here we study about Linux and Cluster Computing giving special emphasis on Concepts of High Performance, High Availability and Load Balancing. Also we do a few of the above clusters implemented.

Content: Introduction, Computer Architecture Overview, High performance computing and Super Computing, Cluster Computing, Cluster Hardware, Nodes, Servers and Gateways, Cluster Software, Cluster Application Environment, Build a Cluster Project, Cluster Administration, Linux Installation and Administration, Setup Server, Network Driver, Gateway, Nodes and RAMDisk, File system Setup and Configuring, MPI Setup and configuration.

3.423 E Commerce & E Business

Credit: 4

E-Commerce describes the manner in which transactions take place of over networks, mostly on Internet. The purpose of this subject is to discuss Commerce, Benefits and Limitations, Electronic Payment System and Security implications.

Content: E-Commerce And Its Technological Aspects, Internet Based E-Commerce: Issues, Problems And Prospects, Electronic Payment Systems, Protocols For Electronic Payment Systems, Security Implications, Cornerstones of Security (Authenticity, Privacy, Integrity, Non-repudiation) Security mechanisms-Cryptographic techniques, Internet Security-Use of Firewalls.

3.445 Project I

Credit: 4

3.446 Project II

Credit: 4

3.447 Project III

Credit: 4