# COURSE SYLLABI

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech - III Semester (CBCS)(With effect from the academic year 2011-12

**DISCRETE MATHEMATICAL STRUCTURES**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

Logic, Prepositional Equivalences, Predicates and Quantifiers, Nested Quantifiers, Rules of Inference, Introduction to Proofs, Proof Methods and Strategy.

**UNIT II**

Sets, Set Operations, Functions, Sequences, and Summation.

Algorithms, Growth of functions, Complexity of algorithms.

The Integers and Division, Integers and Algorithms, Applications of Number Theory, Matrices.

**UNIT III**

Mathematical Induction, Recursive Definitions and Structural Induction, Recursive Algorithms, Program Correctness.

Counting - Basics of Counting, Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations.

**UNIT IV**

Advanced Counting Techniques - Recurrence Relations, Solving Recurrence Relations, Divide-and-Conquer Algorithms and Recurrence Relations, Generating Functions, Inclusion-and-Exclusion and its Applications.

Relations and their properties, n-ary relations and their applications, Representing Relations, Closures of Relations, Equivalence Relations, Partial Orderings, Lattices.

**UNIT V**

Graphs - Introduction, Graph Terminology, Representing Graphs and Graph Isomorphism, Connectivity, Euler and Hamilton Paths, Shortest-Path problems, Planar Graphs, Graph Coloring.

**Text Book:**

Rosen K H, Discrete Mathematics and its Applications, 6th edition, TMH, 2007.

**Reference Books:**


1. Malik D S, Sen M K, Discrete Mathematical Structures: Theory and Applications, Thomson Course Technology, 2004.
2. Mott J L, Kandel A, and Baker T P, Discrete Mathematics for Computer Scientists and Mathematicians, 2nd edition, PHI, 2004.
3. Kolman B, Busby R C, Ross S C, and Rehman N, Discrete Mathematical Structures, 5th edition, Pearson Education, 2006.
4. Lipschutz S, Lipson M, Discrete Mathematics, 2nd edition, TMH, 2006


SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

**DIGITAL LOGIC DESIGN**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

**UNIT I**

Number Representation: Positional number representation, Representation of integers, real numbers, and characters, BCD representation.

Boolean Algebra and Logic Gates: Basic definitions, Axiomatic definition of Boolean algebra, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and Standard forms, Introduction to CAD tools.

Implementation Technology: Transistor switches, NMOS and CMOS logic gates, Standard chips, Practical aspects - Noise margin, Dynamic operation of logic gates, Fan-in and Fan-out in logic gates.

**UNIT II**

Combinational Circuit Building Blocks: Multiplexers, De-multiplexers, Encoders, Decoders, Code converters, Comparators, Parity generators, and checkers.

Optimized Implementation of Logic Function: Karnaugh map, Strategy for minimization, Minimization of product of sums, and sum of product forms, Incompletely specified functions, Multiple output circuits, Multi level synthesis, Analysis of multi level circuits.

**UNIT III**

Algorithmic approach for logic minimization - Quine-McCluskey method.

Arithmetic Circuits: Addition of unsigned and signed numbers, Fast adders, Multiplication of signed integer and floating point numbers.

Synthesis of logic functions using multiplexers, Programmable logic devices such as PLA, PAL, CPLDs, FPGAs, ASICs.

**UNIT IV**

Sequential Circuits: The concept of a sequential circuit, SR flip-flops, D, JK, and T flip-flops, Various clock triggering mechanisms, Master-Slave flip flops; The concept of asynchronous and synchronous sequential circuits, Shift registers, Counters.

**UNIT V**

Sequential Circuits: Basic design steps - State diagram, State table, State assignment, Choice of flip-flops and derivation of next state and output, timing diagram; State assignment problem, Mealy state model, State minimization, Analysis of synchronous sequential circuits, ASM charts, Formal model for sequential circuits.

Asynchronous Sequential Circuits: Asynchronous behavior, Analysis of asynchronous circuits, synthesis of asynchronous circuits, Hazards - static, dynamic; Significance of hazards.

**Text and Reference Books**

Text books:

Brown S, and Vranesic Z, Fundamentals of Digital Logic Design with VHDL, 2nd edition, Tata McGraw-Hill, 2007.

Roth, Jr. C H, Fundamentals of Logic Design, 5th edition, Thomson Brooks/Cole, 2004.

Reference Books:

Wakerly J F, Digital Design - Principles and Practices, 3rd edition, Prentice Hall of India, 2001.

Mano M M, Logic and Computer Design Fundamentals, 2nd edition, Pearson Education Asia, 2001.

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) –

III Semester (CBCS)(With effect from the academic year 2011-12)

**FILE STRUCTURES**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

An Object-Oriented Modelfor implementing Consequential Processes; Methods for External sorting of Large Files - Multiway Merging using Selection Tree, Overlapping Processing and I/O using Heap Sort, Replacement Selection, Multiple-step Merging, Hardware-based impovements, More Drives, More Processors, Multiprogramming, and Performance Evaluation; Sorting files on Tapes - K-way Balanced Merge and Multiphase Merge, Tapes versus Disks for External Sorting.

**UNIT II**

Batch and Online File Processing modes; Input Design for Batch and Online File Processing modes; Output Design. Significance of File Structure Design in File Processing. Case Studies in File Processing. Field and Record Structure Methods and Object-Oriented Models for their Implementation. Beyond Record Structures.

**UNIT III**

Organizing Tracks by sectors and Block, Journey of a Byte, Buffer Management. Portability and Standardization, Data Compression Methods, Reclaiming Space in Files, Internal Sorting Methods, Keysorting.

External Searching Mechanisms - Indexing and Hashing. Simple Index, Access by Multiple Keys, Inverted Lists and Selective Indexes; Multilevel Indexing.

**UNIT IV**

Definition, Insertion, Deletion, Searching and Performance Evaluation of AVL, Paged Binary and B-Trees; Use of B-Trees in Multilevel Indexing; Indexed Sequential File Access and B+-Trees. Variants of B-trees and B+-Trees. Object-Oriented Models for Implementation.

**UNIT V**

Concepts of Static and Extendable Hashing, Hashing Methods; Collision Resolution Techniques; Effects of Hashing Methods, Collision Resolution Techniques, Packing Density, Bucket Size, Hash Table Representations and Deletion Methods on the Performance of External Searching. Role of Radix 2 Tries in Extendible Hashing; Transforming a Trie into

Directory and Performing Insertion, Deletion and Searching Operations; Extendible Hashing Performance; Alternative Approaches; Object-Oriented Models for Implementation.

Text Books:

Folk M J, Zoellick B, and Riccardi G, File Structures - An Object-Oriented Approach with C++, Pearson Education, 1998.

- Senn J A, Analysis and Design of Information Systems, 2nd edition, Tata-McGraw Hill, 2009.

Reference Books:

- Tremblay J P, Sorenson P G, An Introduction to Data Structures with Applications, Tata-McGraw Hill, 1991.
- Sahni S, Data Structures, Algorithms and Applications in C++, 2nd edition, Universities Press, 2005.

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

**FUNDMENTALS OF PROGRAMMING TECHNOLOGIES**

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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**UNIT I**

- Overview of Java Technology - JC, J2SE, J2EE, and J2ME.

**UNIT II**

- Client-Server Computing: Application Layers - Presentation, Application Processing and Data Management Layers; 2-tier, 3-tier and Multi-tier Architectures; Thin and Fat Client Models; Middleware Categories - Distributed Tuples, Remote Procedure Cll, Message-Oriented Middleware and Distributed Objects.

**UNIT III**

- Structure of an HTML document; Static, Interactive, Dynamic, and Active Web Pages; Apache, Apache Tomcat, IIS Web Servers; Microsoft SQL, MySQL, and Oracle Database Servers.

**UNIT IV**

- Client-side Scripting Languages: VBScript, JavaScript, PerlScript, and Java Applets; DHTML Basics.

**UNIT V**

- Server-side Scripting Languages: PHP, Perl, ASP.NET, Java Servelets and JSP; XML Basics.

**Web Documents**:


1. http://www.javaman.com.br/apres/files/JavaEditions.pdf
2. http://www.sharadavikas.com/CourceMeterials/bca34.PDF
3. http://www.dia.uniroma3.it/~cabibbo/ids/altrui/middleware-bakken.pdf
4. http://www.w3schools.com/vbscript/default.asp
5. http://www.upriss.org.uk/perlcgi/l12.pdf
6. http://www.xmlfiles.com/xml/xml_usedfor.asp

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

**BASICS OF ELECTRICAL ENGINEERING**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Review of Ohms law, Kirchoff's laws and simple applications, Fundamentals of alternating current, Series and Parallel circuits with R, L and C.

**UNIT II**

- Representation of periodic functions - Instantaneous, Peak, Average and Effective values of Voltage, Current and Power, Real and Reactive powers, Power factor.
- Basics of Electrical Circuits: Use of Laplace transforms for circuit analysis, Response of R-L-C components for step and sinusoidal excitation, Series and parallel circuits, Concept of resonance.

**UNIT III**

- Network Theorems: Superposition, Maximum power transfer and Thevinin's theorems - simple examples.

  Introduction to Poly-phase systems: 3-phase circuits, Star-delta transformations.
- Basics of Electrical Machines: Introductory concepts of DC generator, DC motor, Transformer, Single phase induction motor, Stepper motor.

**UNIT IV**

- Fundamentals of Control systems: Control Systems Components, Transfer function, Servomechanism, Concept of stability PID control. (Discussion to be restricted to 2nd order systems only)

**UNIT V**

- Rectifiers and Power Supplies: Half-wave and full-wave rectifiers, C filter, Concept of power conditioning, Shunt and series Regulation, Voltage Regulators - Three terminal and switching regulators, Principle of operation of buck-boost and servo voltage regulators, Spike suppressors, Introduction to switched mode power supplies (SMPS) and uninterruptible power supplies. (only concepts)

Text Books:

1. Kothari D P, Nagrath I J, Basic Electrical Engineering, 2nd edition, TMH, 2002.

2. Naidu M S, Kamakshaiah S, Introduction to Electrical Engineering, TMH, 2001.

Reference Books:

1. Cathey J J, Nasar S A, Basic Electrical Engineering, TMH, 2006.
2. Fowler R J, Electricity - Principles and Applications, 4th edition, TMH, 2001.
3. Grob B, Basic Electronics, 8th edition, TMH, 2000.
4. Murugesh Kumar K and Jagannadhan V, Basic Electrical, Electronics, Computer & Communication Engineering, 2nd edition, Vikas, 2000.
5. Nagoor Kani A, Control Systems, RBA Publications, 1998.

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

ELEMENTS OF ELECTRONICS AND COMMUNICATION ENGINEERING

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Basic Electronic Devices: Semiconductor fundamentals, Principle of operation and V-I Characteristics of Diodes (PN, Zener, Photo, LED, Laser Diode), Transistors (BJT, JFET, MOSFET).

  Microelectronics: Concept of miniaturization of electronic systems, Basic principles of monolithic integrated circuit technology, IC fabrication of simple circuit elements.

**UNIT II**

- Transistor Amplifiers: Concept of an amplifier -Gain, Input and Output impedance, Frequency response, Biasing of a transistor, CB, CE and CC Configurations and their characteristics, Multi stage Amplifiers.
- Concept of feedback: Negative and Positive feedback, Advantages and limitations, Oscillator Operation, RC phase shift oscillator and Crystal oscillator.

**UNIT III**

- Analog ICs: Concept of differential amplifier, Operational Amplifier (OPAMP), Characteristics of an OP AMP and its applications - Inverting and non-inverting amplifiers, Summer, Integrator, Differentiator.555 timer, and its application as multi-vibrator, Phase Locked Loop (PLL), and its application as frequency multiplier.

**UNIT IV**

Basics of Communication Engineering: Introduction, Signal Spectrum, Bandwidth, Noise; Concept of Communication - Source, Channel, Sink; Types of channels; Concept of information and entropy, Shannon's law, Bit rate; Analog Modulation Schemes - AM, FM; Pulse Modulation Schemes - Sampling, PAM, PWM, PPM, PCM, DM; Multiplexing - FDM,TDM.

**UNIT V**

- A/D and D/A Converters: D to A converters- Basic principle, Weighted resistor and ladder types; A to D Converters - Basic principle, Ramp, Successive approximation types.
Basic Electronics Instruments: Block diagram and principle of operation of - Digital Multi-meter, Function generator, Cathode Ray Oscilloscope (CRO).
Text Books:


1. Bogart Jr. T F, Beasley J S, and Rico G, Electronic Devices and Circuits, 6th edition, Pearson Education, 2006.
2. Malvino A, and Bates D J, Electronic Principles, 7th edition, Tata McGraw-Hill, 2007.


Reference Books:


1. Deshpande N P, Electronic Devices and Circuits - Principles and Applications, Tata McGraw-Hill, 2007.
2. Muthusubramanian R, Salivahanan S, and Muraleedharan K A, Basic Electrical, Electronics, and Computer Engineering, 2nd edition, Tata McGraw-Hill, 2001. (Part II - Electronics Engineering only)
3. Stanley W D, Hackworth J R, and Jones R L, Fundamentals of Electrical Engineering and Technology, Thomson Delmar Learning, 2007. (Part III - Electronic Devices and Linear Electronics only)
4. Gates E D, Introduction to Electronics, 5th edition, Thomson Delmar Learning, 2007. (Sections 3 and 4 only)
5. Storey N, Electronics - A Systems Approach, 2nd edition, Pearson Education Asia, 2001.

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SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

ELEMENTS OF MECHANICAL ENGINEERING

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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**UNIT I**

- Steam Boilers: Cochran Boiler, Boiler Mountings, Locomotive Boiler, Babcock and Wilcox Boiler, Lamont Boiler, Benson Boiler, Differences between Fire Tube and Water Tube Boilers, Cogeneration.
- Steam Turbines: Main Parts of a Steam Turbine, Types of Turbines, Working of a Single Stage Impulse Turbine (De-Laval Turbine), Compounding of Impulse Steam Turbines, Working of Parson's Reaction Turbine, Differences between Impulse and Reaction Turbines. Power Plants: Classification of Power Plants, Steam Power Plants, Nuclear Power Plant, Gas Turbines, Diesel Power Plant, Hydro Power Plant, Environmental Constraints of Power Generation, Solar Energy, Wind Energy, Tidal Power, Geothermal Power, Ocean Thermal Energy Conversion (OTEC).

**UNIT II**

- Mechanisms and Machines: Mechanism and Machine, Rigid and Resistant Bodies, Link, Kinematic Pair, Degrees of Freedom, Classification of Kinematic Pairs, Kinematic Chain, Linkage, Mechanism and Structure, Mobility of Mechanisms, Equivalent Mechanisms, The Four-Bar Chain, Mechanical Advantage, Transmission Angle, The Slider-Crank Chain, Miscellaneous Mechanisms.

**UNIT III**

- Internal Combustion Engines: Classification, Main Components, 2-stroke and 4-stroke Petrol Engines, 2-stroke and 4-stroke Diesel Engines, Differences between Petrol Engines and Diesel Engines, Fuel System in a petrol Engine, Battery or Coil Ignition System, Cooling System in I.C. Engines, Lubrication System, Fuel System for Diesel Engines, Petrol Injection, Differences between Diesel Injection and Petrol Injection
- Refrigeration and Air Conditioning: Refrigeration, Refrigerants, and their desirable Properties, Methods of Refrigeration, Requirements of Comfort Air Conditioning, Window Air Conditioner, Thermo Electric Cooling.

- Transmission of Power: Belt and Rope Drives, Types of Belts, Materials, Types of Flat Belt Drives, Velocity Ratio or Speed Ratio, Rope Drives, Gear Trains and their Types.

**UNIT IV**

Metal Casting Process: Advantages of the Casting Process, Patterns, Molding, Melting of Cast Iron, Crucible Furnace, Fettling, Casting Defects.

Metal Forming Processes: Forging, Rolling, Extrusion, Drawing.

- Metal Joining Processes: Welding, Arc Welding, Gas Welding, Gas Cutting, Brazing, Soldering.

**UNIT V**

- Metal Removal Processes: Lathe, Drilling Machines, Shaping Machine, Milling Machine.
- Introduction to CAD, CAM and CIM: Computer Aided Design, Advantages of CAD, Computer Aided Manufacturing (CAM), Functions of a Robot in Manufacturing Applications, Advantages of Robots, Computer Integrated Manufacturing (CIM).

Text Books:

1. Shanmugam G, Basic Mechanical Engineering, 3rd Edition, Tata McGraw-Hill, 2000. (Chapters 1 to 3 for Unit I; 4, 12, and 13 for Unit III; 5 to 7 for Unit IV; 8 and 11 for Unit V)
2. Rattan S S, Theory of Machines, 2nd Edition, Tata McGraw-Hill, 2005 ( Chapter 1 for Unit II)

Reference Book:

Wickert J, An Introduction to Mechanical Engineering, Thomson Brooks/Cole, 2004.

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

**FILE STRUCTURES LABORATORY**

No. of Credits: 1

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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At least 10 assignments are to be given covering the topics of the course, "File Structures".

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

**FUNDMENTALS OF PROGRAMMING TECHNOLOGIES LABORATORY**

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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At least 10 assignments are to be given covering the topics of the course, "Fundamentals of Programming Technologies".

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

**ELECTRICAL ENGINEERING LABORATORY**

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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A list of experiments, such as the following, related to the course "Basics of Electrical Engineering" are to be given:

- Phase angle measurement and power calculations in R-L-C circuits.
- Verification of Kirchoff"s laws.
- Measurement of resonance frequency and Q factor in series and parallel R-L-C circuits.
- Verification of Superposition theorem.
- Verification of thevinin's theorem.
- Verification of maximum power transfer theorem.
- Load test on DC shunt motor.
- Load test on transformer.
- Experimental determination of stepper motor characteristics.
- Servomechanism: lead - lag measurements, PID control.
- Diode Bridge Rectifier, and Measurement of Ripple factor with and without C filter.
- Regulated power Supply using 7812 and 7912, and Measurement of ripple factor.

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE)

III Semester (CBCS)(With effect from the academic year 2011-12)

## ELECTRONICS AND COMMUNICATION ENGINEERING LABORATORY

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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A set of assignments related to the course 'Elements of Electronics and Communication Engineering' are to be given. Recommended list of experiments:

- Study of DC power supplies, Multi meter, Function Generator, and CRO and how to use them.
- PN Diode & Zener diode characteristics.
- BJT and MOSFET input & Output Characteristics.
- Frequency Response of Common Emitter Amplifier.
- Applications of OP AMP - 1.
- Applications of OP AMP - 11.
- 555 Timer Based Multi-vibrators.
- PLL based Frequency Multiplier.
- Divide by N counter using Flip-flops.
- 4-bit shift register using Flip-flops.
- Study of Analog Modulation Schemes - Observation of the waveforms of carrier, modulating, and the modulated signals for AM, FM, and PM schemes.
- Study of Pulse Modulation Schemes - Observation of the waveforms of carrier, modulating, and the modulated signals for PAM, PPM, PWM, PCM schemes.

IV Semester (CBCS)(With effect from the academic year 2011-12)

**SOME TOPICS IN MATHEMATICS**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Complex Analysis: Analytical functions, Cauchy-Riemann equation, Complex integration, Cauchy's theorem, Integral formula, Evaluation of integrals.

**UNIT II**

- Partial Differential Equations: Formation of differential equations, Classification, First order linear partial differential equations, Lagrange linear equation, Method of multipliers, First order non-linear partial differential equations, Charpit's method.

**UNIT III**

Mathematical Induction: Strong induction, and Well-ordering, Recursive definitions, and Structural induction, Recursive algorithms, Program correctness.

**UNIT IV**

- Algebraic systems: Introduction, Operations, Semigroups, Groups, Subgroups, Normal subgroups, Homomorphisms, Rings, Integral domains, and Fields, Polynomials over a field. (Emphasis on definitions and examples)

Counting - Basics of Counting, Pigeonhole Principle, Permutations and Combinations, Binomial Coefficients, Generalized Permutations and Combinations, Generating Permutations and Combinations.

**UNIT V**

- Advanced Counting Techniques - Recurrence Relations, Solving Recurrence Relations, Divide-and-Conquer Algorithms and Recurrence Relations, Generating Functions, Inclusion-and-Exclusion and its Applications.

Text Books:

1. Rosen K H, Discrete Mathematics and Its Applications, Tata McGraw-Hill, 2007.

2. Lipschutz S, Lipson M L, Discrete Mathematics, 3rd edition, Tata McGraw-Hill, 2010.

Reference Books:

1. Grewal B S, Higher Engineering Mathematics, 40th Edition, Khanna Publications, 2007.
2. Venkataraman M K, Engineering Mathematics, Vol. I & II, National Publishing Company, 1993.
3. Venkataraman M K, Engineering Mathematics, National Publishing Company, 1995.
4. Grewal B S, Engineering Mathematics, 13th Edition, Khanna Publications.
5. Kreyszig E, Advanced Engineering Mathematics, 8th edition, Wiley, 1998.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) IV Semester (CBCS)(With effect from the academic year 2011-12)

**COMPUTER ORIENTED NUMERICAL METHODS**

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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**UNIT I**

Errors in Numerical Calculations: Truncation and Round-off errors, Effect of errors in data; Closed form solution versus Iterative methods.

Roots of Nonlinear Equations: Bisection, False position and, Newton-Raphson methods.

**UNIT II**

- Iterative Solution of Liner Equations - Jacobi iteration, Gauss-Seidel and Relaxation methods; Convergence of iteration methods.

**UNIT III**

- Interpolation - Lagrange polynomials, Newton's difference formula, Cubic splines, and Two dimensional interpolation.

**UNIT IV**

- Numerical Differentiation - Differentiating continuous and tabulated functions, Difference tables and Richardson extrapolation. Numerical integration - Trapezoidal, Simpson's 1/3 and Simpson's 3/8 Rules.

**UNIT V**

- Numerical Solution of Ordinary Differential Equations - Taylor's Series, Euler's, Runge-Kutta methods.

Text Book:

- Schilling R J, and Harries S L, Applied Numerical Methods for Engineers Using MATLAB and C, Thomson Brooks/Cole, 2006.

Reference Books:


1. Chapra S C, Applied Numerical Methods with MATLAB for Engineers and Scientists, 2nd edition, Tata McGraw-Hill, 2007.
2. Gerald C F, and Wheatley P O, Applied Numerical Analysis, 6th edition, Pearson Education Asia, 2002.
3. Niyogi P, Numerical Analysis and Algorithms, Tata McGraw Hill, 2003.
4. Heath M T, Scientific Computing: An Introductory Survey, McGraw-Hill, 1997.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) IV Semester (CBCS)(With effect from the academic year 2011-12)

**COMPUTER ORIENTED OPTIMIZATION TECHNIQUES**

No. of Credits: 3 Instruction Hours/Week: 3

Instruction Weeks/Semester: 14 ( Lectures:2, Tutorials:1 )

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**UNIT I**

- Overview of Operations Research, Modeling approach, Decision analysis and Games- Decision environments, Decision making under certainty, Decision making under risk, Decision making under uncertainty, Game theory.

**UNIT II**

- Liner Programming - Formulation, Graphical method, Simplex method, Duality. Formulation of transportation, Assignment and Transshipment models. Goal programming - Formulation, Weighting and Preemptive methods.

**UNIT III**

- Integer Linear Programming - Applications, Branch and bound, and Cutting plane algorithms.

**UNIT VI**

- Nonlinear Programming - Sample applications, Graphical illustration of nonlinear programming problems, Types of nonlinear programming problems, One-variable unconstrained optimization, Multivariable unconstrained optimization.

**UNIT V**

Karush-Kuhn-Tucker conditions for constrained optimization, Quadratic programming, Separable programming, Convex programming and Non-convex programming.

Text Book:

- Hillier F S, and Lieberman G J, Introduction to Operations Research, 7th edition, Tata McGraw-Hill, 2003.

Reference Books:


1. Taha H A, Operations Research - An Introduction, 8th edition, Prentice Hall of India, 2006.
2. Wagner H M, Principles of Operations Research with Applications to Managerial Decisions, 2nd edition, Prentice Hall of India, 2004.
3. Tulsian P C, and Pandey V, Quantitative Techniques - Theory and Problems, Pearson Education, 2002.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) IV Semester (CBCS)(With effect from the academic year 2011-12)

**SIMULATION AND MODELING**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Queuing Theory - Basic Structure of Queuing Models, Examples of Real queuing Sys of Real queuing Systems, Role of Exponential Distribution, Birth-and-Death Process, Based on Queuing Models Birth-and-Death Process, Queuing Models Involving Non-exponential Distributions, Priority-Discipline Queuing Models and Queuing Networks. Application of Queuing Theory Models - Examples, Decision making, Formulation of Waiting Cost Functions and Decision Models.

**UNIT II**

- Deterministic Inventory Models - General Inventory Model, Static EOQ Models and Dynamic EOQ Models.
- Probabilistic Inventory Models - Continuous Review Models, Single period Models and Multi-period Model.
- Selective Inventory Control - ABC, VED and FSN Analyses; Types of Inventory Systems.

**UNIT III**

Basic Simulation Modeling, Modeling Complex Systems and Simulation Software.

**UNIT IV**

- Random-Number Generation, Random-Variate Generation, Verification and Validation of Simulation Models.

**UNIT V**

- Output Data Analysis for a Single System, Comparing Alternative System Configurations, Variance-Reduction Techniques and Simulation of Computer Systems.

Text Books:

1. Law A M, Simulation Modeling and Analysis, 4th edition, McGraw-Hill, 2007. (Chapters 1,2, and 3 for Unit III, Chapters 9, 10, and 11 for Unit V).
2. Hiller F S and Lieberman G J, Introduction to Operation Research, 7th edition, Tata McGraw-Hill, 2001. (Chapters 17 and 18 for Unit I).
3. Taha H A, Operations Research - An Introduction, 8th edition, Prentice Hall of India, 2007. (Chapter 11 and 14 for Unit II).
4. Banks J, Carson II J S, Nelson B L, Nicole D M, and Shahabudeen P, Discrete-Event System Simulation, Pearson Education, 2007. (Chapter 4 for Unit III Chapters 7, 8, and 10 for Unit IV and Chapters 11, 12, and 14 for Unit V).

Reference Book:

- Seila A F, Ceric V, and Tadimalla P, Applied Simulation Modeling, Thomson Brooks/Cole, 2003.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)

**COMPUTER ORGANIZATION**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

**UNIT I**

- Structure of Computers: Introduction, Performance, Historical perspective, Memory addressing and operations, Instructions and Instruction Sequencing, Addressing modes, Basic I/O operations, Subroutines, Encoding of machine instructions, Brief description and functional classification of lA-32 Pentium instruction Set.

**UNIT II**

- Input / Output Organization: Accessing I/O devices, Interrupts, Handling multiple devices; Direct Memory access, Bus arbitration, Buses - Synchronous, and Asynchronous, Interface circuits - parallel port, Serial port.

**UNIT III**

- The memory System: Basic Concepts, RAM and ROM memories, and their internal organization, Cache Memories, Mapping functions, Replacement Algorithms, Performance considerations, Virtual Memories, Secondary storage, Magnetic and Optical disks, Magnetic tape systems. Arithmetic Unit: Multiplication, Booth algorithm, Integer division, Floating-point addition/subtraction.

**UNIT IV**

Basic processor Unit: Fundamental Concepts, Single and multiple bus organization, Hardwired control, Multi-programmed control. Design of a Hypothetical Processor: Formal description using Register Transfer Notation (RTN), A1-bus micro-architecture and hardwired control unit design for the hypothetical processor.

**UNIT V**

- Pipelining: Basic concepts, Data hazards, Instruction hazards, Influence on instruction sets, Data path and control considerations, Super scalar operation, Performance Considerations. Processor Families: The ARM family, The Motorola 680x0 and Coldfire families, The IA-32 family, The IA-64 family.

Text Books:

1. Hamacher C, Vranesic Z, and Zaky S, Computer Organization, 5th edition, McGraw-Hill, 2002.

2. Heuring V P, and Jordan H F, Computer systems Design and Architecture, Pearson Education, 1997.

Reference Books:

1. Carpinelli J D, Computer System Organization and Architecture, Addison-Wesley, 2001.
2. Stallings W, Computer Organization & Architecture - Designing for Performance, 7th edition, Pearson Education, 2006.
3. Tanenbaum A S, Structured Computer Organization, 5th edition, Pearson Education, 2006.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)

**DATABASE MANAGEMENT SYSTEMS**

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Databases and Database Users: Database approach, its characteristics, and advantages, A brief history of database applications, When not to use a DBMS.
- Database System Concepts and Architecture: Data models, Schemas, and Instances, Three-schema architecture, Data independence, Database languages, Centralized and client-server architectures for DBMS, Classification of DBMSs.
- Data Modeling using Entity-Relationship (ER) Model: High level conceptual data models, Entity types, Entity sets, Attributes, Keys, Relationship types, Relationship sets, Roles, Structural constraints, Weak entity types, ER diagrams, Naming conventions, Design issues, UML class diagrams, Higher degree relationship types.
- The Enhanced Entity-Relationship (EER) Model: Subclasses, Super classes, Inheritance, Specialization, Generalization, Design choices, Formal definitions, Representing specialization and generalization in UML class diagrams, Data abstraction, Knowledge representation, Ontology concepts.

**UNIT II**

- The Relational Data Model and Relational Database Constraints: Relational model concepts, Constraints, Schemas, Update operations, Transactions, Dealing with Constraint violations.
- The Relational Algebra and Relational Calculus: Relational operations, Queries in relational algebra, Tuple relational calculus, Domain relational calculus.
- Relational Database Design by ER- and EER-to-Relational Mapping: ER-to-relational mapping, Mapping EER model constructs to relations.
- SQL 99 Schema Definition, Constraints, Queries and Views: SQL data definitions, data types, Specifying constraints, Schema change statements, Basic queries, Assertions and Triggers, Views.
- Introduction to SQL Programming Techniques: Database programming, Embedded SQL, Dynamic SQL, SQLJ, Function calls - SQL/CLI and JDBC, Database stored procedures, SQL/PSM.

**UNIT III**

Functional Dependencies and Normalization for Relational Databases: Informal design guidelines for relation schemas, Functional dependencies, Normal forms, 2nd and 3rd normal forms, Boyce-Codd normal form.

Relational Database Design Algorithms and Further Dependencies: Properties of relational decompositions, Algorithms for relational database schema design, Multivalued dependencies, 4th normal form, Join dependencies, 5th normal form.

Practical Database Design Methodology and Use of UML Diagrams: Role of information systems in organizations, Database design and implementation process, Use of UML diagrams as an aid to database design specification, Rational rose - a UML based design tool, Automated database design tools.

**UNIT IV**

- Algorithms for Query Processing and Optimization: Translating SQL queries into relational algebra, Algorithms for various SQL operations, Using heuristics in query optimization, Using selectivity and cost estimates in query optimization, Overview of query optimization in Oracle, Semantic query optimization.

Introduction to Transaction Processing Concepts and Theory: Introduction, Transaction and system concepts, Desirable properties of transactions, Characterizing schedules based on recoverability, and serializability, Transaction support in SQL.

- Concurrency Control Techniques: Two phase locking techniques for concurrency control, Concurrency control based on time stamp ordering, Multiversion concurrency control techniques, Validation concurrency control, Granularity of data items and multiple granularity locking, Using locks for concurrency control in indexes.
- Database Recovery Techniques: Recovery concepts, Recovery techniques based on deferred update, and immediate update, Shadow paging, ARIES recovery algorithm, Recovery in multidatabase systems, Database backup, recovery from catastrophic failures.

**UNIT V**

- Object-Relational and Extended-Relational Systems: Object-relational features of SQL and Oracle, Nested relational model.

Database Security: Introduction, Discretionary access control, Mandatory access control, Role-based access control, Introduction to statistical database security, Introduction to flow control, Encryption, Public key infrastructures, Privacy issues and preservation, Challenges of database security.

Distributed Databases and Client-Server Architectures: Distributed database concepts, Data fragmentation, Replication, Allocation techniques for distributed database design, Types of distributed database systems, Query processing in distributed databases, Overview of concurrency control and recovery, An overview of 3-tier client-server architecture, Distributed databases in Oracle.

Text Book:

- Elmasri R, and Navathe S B, Fundamentals of Database Systems, 5th edition, Pearson Education, 2008. (Chapters 1, 2, 3, and 4 for Unit I; Chapters 5, 6, 7, 8, and 9 for Unit II; Chapters 10, 11, and 12 for Unit III; Chapters 15, 17, 18, and 19 for Unit IV; Chapters 20, 22, 23, and 25 for Unit V)

Reference Books:

1. Silberschatz A, Korth H F, and Sudarshan S, Database System Concepts, 5th edition, McGraw-Hill, 2006.
2. Ramakrishnan R, and Gehrke J, Database Management Systems, 3rd edition, McGraw-Hill, 2003.
3. Date C J, An Introduction to Database Systems, 7th edition, Pearson Education, 2000.
4. Rob P, Database Systems - Design, Implementation, and Management, 7th edition, Thomson, 2007.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)

**DATA COMMUNICATIONS**

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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**UNIT I**

Data Communications and Networking Overview: Introduction, Communications model, Data communications, Networking.

- Protocol Architecture: Justification, A simple protocol architecture, OSI, TCP/IP.

**UNIT II**

Data Transmission: Concepts and terminology, Analog and digital data transmission, Transmission Impairments, Channel Capacity.

- Guided Transmission Media: Twisted pair, Coaxial cable, Optical fiber.

**UNIT III**

Unguided Transmission Media: Wireless transmission, Antennas, Microwave, Broadcast radio, Wireless propagation, Line-of-site transmission, Multipath, Refraction.

Signal Encoding Techniques: Digital data, Digital Signal; Digital data, Analog Signal; Analog data, Digital Signal; Analog data, Analog Signal.

**UNIT IV**

- Digital Data Communication Techniques: Asynchronous and synchronous transmission, Error detection and correction, Line configurations, Interfacing.
- Data Link Control Protocols: Flow control, Error control, High level data link control.

**UNIT V**

Multiplexing: Frequency division multiplexing, Synchronous time division multiplexing, Statistical time division multiplexing, Asymmetric digital subscriber line, xDSL.

Spread Spectrum: Introduction, Frequency hopping spread spectrum, Direct sequence spread spectrum, Code division multiple access.

Text Book:

Stallings W, Data and Computer Communications, 7th edition, Pearson Education, 2004.

Reference Books:

1. Halsall F, Data Communications, Computer Networks, and Open Systems, 4th edition, Pearson Education, 1996.
2. Forouzan B, Data Communications and Networking, 4th edition, Tata McGraw-Hill, 2007.
3. Guptha P C, Data Communications and Computer Networks, Prentice-Hall of India, 2006.
4. Shay W A, Understanding Data Communications and Networks, 2nd edition, Brooks/Cole Thomson Learning, 1999.

SRI VENKATESWARA UNIVERSITY::TIRUPATI

B Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)

SIMULATION AND MODELING LABORATORY

No. of Credits: 1

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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At least 15 assignments are to be given covering the following:

- Development of a function for generation of pseudo-random numbers between 0 and 1.
- Development of functions for generating random variates for continuous and discrete probability distributions using inverse transform technique, direct transformation, convolution method and acceptance-rejection technique.
- Design and development of a package for input modeling.

- Design and development of a simulation model for
  - Infinite single server queuing system
  - Infinite multiple server queuing system
  - Finite single server queuing system
  - Finite multiple server queuing system
- Design and development of a simulation model for determining the parameters of Fixed Order Quantity System
- Design and development of a simulation model for determining the parameters of periodic Review System
- Design and development of a simulation model for determining the parameters of S-S policy

CSP09

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)ASSEMBLY LANGUAGE PROGRAMMING LABORATORY
No. of Credits: 1
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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At least 15 assignments are to be given, covering

- Reading and displaying string, and numerical data.
- Basic string operations.
- Basic arithmetic operations.
- Simple table processing. (array of strings, matrices)
- Simple file operations.

- Macros.
- Mixed language programming.
- Accessing ports - printing, file transfer from PC to PC.

CSP10

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)DATABASE MANAGEMENT SYSTEMS LABORATORY
No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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- At least 7 assignments are to be given covering the topics of the course, "Database Management Systems".
- A mini project is to be given, to implement a simple database application using either 2-tier or 3-tier client/server architecture. An appropriate graphical user interface, with input screens and report generation facility is to be incorporated.

CSP11

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)VHDL LABORATORY
No. of Credits: 1
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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- A set of assignments are to be given, to simulate Combinational and sequential digital circuits using computer packages, such as klogic, ksimu, pspice in MS windows and Linux environments.
- A set of assignments are to be given, to represent digital logic using VHDL code, simulate, generate and verify timing diagrams, program an FPGA, and test it. A VHDL package such as Xilinx ISE is to be used to perform these experiments.

Reference Books:


1. Bhasker J, VHDL Primer, 3rd edition, Printice Hall India, 2004.
2. Chang K C, Digital Systems Design with VHDL and Synthesis: An Integrated Approach, IEEE Computer Society Press, 2005.
3. Chartrand L, Digital Fundamentals: Experiments and Concepts with CPLDs, Thomson Delmer Learning, 2004.

4. klogic - User Manual.
5. ksimu - User Manual.
6. pspice - User Manual.
7. Xilinx ISE - User Manual.
8. Brown S, and Vranesic Z, Fundamentals of Digital Logic Design with VHDL, 2nd edition, Tata McGraw-Hill, 2007. (Appendix A - VHDL Reference)

MAP01

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - IV Semester (CBCS)(With effect from the academic year 2011-12)MATHEMATICAL TOOLKIT LABORATORY
No. of Credits: 1
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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- A set of assignments related to the courses - 'Probability and Statistics, Computer oriented Numerical methods, Computer oriented Optimization techniques', are to be given.
- Computer packages, such as Scilab, Matlab, Octave, Mathematica, Ampl, Minitab, Lindo, Lingo, Tora, Whatsbest, SPSS are to be used in MS Windows and Linux environments to perform the above assignments.

Reference Books:

1. scilab - User Manual.
2. lindo API - User Manual.
3. lingo - User Manual.
4. Maple - User Manual.
5. Mathematica - User Manual.
6. Tora - User Manual.
7. Ampl - User Manual.

8. Fourer R, Gay D M, and Kernighan B W, AMPL - A Modeling Language for Mathematical Programming, 2nd edition, Thomson Brooks/Cole, 2003.
9. MS Excel - User Manual.
10. SPSS - User Manual.
11. Octave - User Manual.
12. Minitab - User Manual.

CS 301

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)THEORY OF COMPUTATION

No. of Credits: 4
Instruction Weeks/Semester: 14 Instruction Hours/Week: 4

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**UNIT I**

- Review of Basic Mathematical Objects: Sets, Logic, Functions, Relations, Languages.

- Review of Mathematical Induction and Recursive Definitions: Proofs, Mathematical Induction, Recursive Definitions, Structural Induction.
- Regular Expressions and Finite Automata: Regular languages, Regular expressions, Memory requirement for language recognition, Finite automata, Distinguishing strings, Unions, Intersections, and Complements.
- Finite Automata with Output: Moore machine, Mealy machine, Moore versus Mealy, Transducers as models of sequential circuits.

**UNIT II**

- Nondeterminism and Kleene's Theorem: Nondeterministic finite automata (NFA), NFA with ?-transitions, Kleene's theorem.
- Regular and Nonregular Languages: A criterion for regularity, Minimal finite automata, Pumping lemma for regular languages, Decision problems, Regular languages versus programming languages.

**UNIT III**

- Contex-Free Grammars: Definition, Examples, Regular grammars, Derivation trees and ambiguity, An unambiguous CFG for algebraic expressions, Simplified forms and normal forms.
- Pushdown Automata: Definition, Deterministic pushdown automata, Pushdown automata versus context-free grammar, Parsing.

**UNIT IV**

- Context-Free and Non-Context-Free Languages: Pumping lemma for context-free languages, Intersections and Complements of context-free languages, Decision problems involving context-free languages.
- Turing Machines: Definition, Examples, Computing a partial function with a Turing machine, Combining Turing machines, Multi-tape Turing machines, Non deterministic Turing machines, Universal Turing machines, Models of computation and the Church-Turing thesis.

**UNIT V**

- Recursively Enumerable Languages: Recursively enumerable and recursive, Enumerating a language, More general grammars, Context-sensitive languages and the Chomsky hierarchy, Not recursively enumerable languages.
- Unsolvable Problems: Non-recursive languages and unsolvable problems, Reducing one problem to another - Halting problem, Other unsolvable problems involving Turing machines, Rice's theorem, Post's correspondence problem, Unsolvable problems involving context-free languages.
- Computable Functions: Primitive recursive functions, Primitive recursive predicates and some bounded operations, Unbounded minimalization and ?-recursive functions, Gödel numbering, Computable functions versus ?-recursive functions, Non-numeric functions, and computability.

Text Books:


1. Martin J C, Introduction to Languages and the Theory of Computation, 3rd edition, Tata McGraw-Hill, 2003.
2. Hopcroft J E, Motwani R, and Ullman J D, Introduction to Automata Theory, Languages, and Computation, 3rd edition, Pearson Education, 2008.


Reference Books:


1. Krithivasan K, Introduction to Formal Languages, Automata Theory and Computation, Pearson Education, 2009.
2. Rich E, Automata, Computability, and Complexity - Theory and Applications, Pearson Education, 2012.
3. Singh A, Elements of Computation Theory, Springer, 2009.
4. Cohen D I A, Introduction to Computer Theory, 2nd edition, John Wiley, 2000.
5. Lewis H, Papadimitriou C H, Elements of the Theory of Computation, 2nd edition, Prentice Hall, 1997.

CS 302

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)DESIGN AND ANALYSIS OF ALGORITHMS

No. of Credits: 4 Instruction Hours/Week: 4
Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Introduction: Notion of algorithm, Fundamentals of algorithmic problem solving, Important problem types - sorting, searching, string processing, graph problems, combinatorial problems, geometric problems, numerical problems.
- Fundamentals of the Analysis of Algorithm Efficiency: Analysis framework, Asymptotic notations and basic efficiency classes, Mathematical analysis of recursive and non-recursive algorithms, Example fibonacci numbers, Empirical analysis of algorithms, Algorithms visualization.

**UNIT II**

- Brute Force Methods: Selection sort and bubble sort, Sequential search and brute-force string matching, Closest-pair and convex-hull problems by brute force, Exhaustive search.
- Divide-and-Conquer: Mergesort, Quicksort, Binary search, Binary tree traversals, Multiplication of large integers, Strassen's matrix multiplication, Closest-pair and convex-hull problems by divide-and-conquer.
- Decrease-and-Conquer: Depth-first search and breadth-first search, Topological sorting, Algorithms for generating combinatorial objects, Decrease-by-a-constant-factor algorithms, Variable-size-decrease algorithms.

**UNIT III**

- Transform-and-Conquer: Presorting, Gaussian elimination, Balanced search trees, Heaps and heapsort, Horner's rule, and binary exponentiation, Problem reduction.
- Space and Time Tradeoffs: Sorting by counting, Input enhancement in string matching, Hashing, B-trees.
- Dynamic Programming: Computing a binomial coefficient, Warshall's and Floyd's algorithms, Optimal binary search trees, Knapsack problem and memory functions.

**UNIT IV**

- Greedy Technique: Prim's Algorithm, Kruskal's algorithm, Dijkstra's algorithm, Huffman trees.
- Limitations of Algorithm Power: Lower bound arguments, Decision trees, P, NP, and NP-complete problems, Challenges of numerical algorithms.
- Coping with the Limitations of Algorithm Power: Backtracking, Branch-and-bound, Approximation algorithms for NP-hard problems, Algorithms for solving nonlinear equations.

**UNIT V**

- Introduction to Parallel Algorithms and Architectures: Design of parallel algorithms, Architecture constraints, Computing dot product on EREW PRAM versus the 2?dimensional mesh, Pseudocode conventions for PRAMs and interconnection network models, Performance measures of parallel algorithms.
- Parallel Sorting: Sorting on CRCW and CREW PRAMS, Odd-even merge sort on EREW PRAM, Sorting on one and two dimensional meshes, Sorting networks.

Text Books:


1. Levitin A, Introduction to the Design and Analysis of Algorithms, Pearson Education, 2003. (for UNITS I to IV)
2. Berman K A, and Paul J L, Fundamentals of Sequential and Parallel Algorithms, Thomson Brook/Cole, 1997. (Chapters 5 and 6, for UNIT V)


Reference Books:


1. Cormen T H, Leiserson C E, Rivest R L, and Stein C, Introduction to Algorithms, 3rd edition, Prentice-Hall of India, 2009.
2. Horowitz E, Sahni S, and Rajasekaran S, Fundamentals of Computer Algorithms, 2nd edition, Universities Press, 2007.
3. Goodrich M T, Tamassia R, Algorithm Design, Wiley, 2006.
4. Skiena S S, The Algorithm Design Manual, 2nd edition, Springer, 2008.
5. Heineman G T, Pollice G, Selkow S, Algorithms in a Nutshell, O'Reilly (Shroff), 2009.
6. Dave P H, and Dave H B, Design and Analysis of Algorithms, Pearson Education, 2008.

CS 303

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)OPERATING SYSTEMS

No. of Credits: 4 Instruction Hours/Week: 4
Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Introduction: Definition of operating system, User view, System view, Computer system organization, Computer system architecture, Operating system structure, Operating system operations, Process management, Memory management, Storage management, Protection and security, Distributed systems, Special purpose systems, Computing environments.
- System Structures: Operating system services, User - Operating system interface, System calls, Types of system calls, System programs, Operating system design and implementation, Structure, Implementation, System generation, System boot.

**UNIT II**

- Process Concept: Process scheduling, Operations on processes, Interprocess communication, Communication in client server systems.
- Multithreaded Programming: Multitheading models, Thread libraries, Threading issues, Examples.
- Process Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Thread scheduling, Examples.

- Inter-process Communication: Race conditions, Critical Regions, Mutual exclusion with busy waiting, Sleep and wakeup, Semaphores, Mutexes, Monitors, Message passing, Barriers, Classical IPC Problems - Dining philosophers problem, Readers and writers problem.

**UNIT III**

- Memory-Management Strategies: Introduction, Swapping, Contiguous memory allocation, Paging, Segmentation, Examples.
- Virtual Memory Management: Introduction, Demand paging, Copy-on-write, Page replacement, Frame allocation, Thrashing, Memory-mapped files, Kernel memory allocation, Examples.

**UNIT IV**

- Deadlocks: Resources, Conditions for resource deadlocks, Ostrich algorithm, Deadlock detection and recovery, Deadlock avoidance, Deadlock prevention.
- File Systems: Files, Directories, File system implementation, management and optimization.
- Secondary-Storage Structure: Overview of disk structure, and attachment, Disk scheduling, RAID structure, Stable storage implementation.

**UNIT V**

- System Protection: Goals of protection, Principles and domain of protection, Access matrix, Access control, Revocation of access rights.
- System Security: Introduction, Program threats, System and network threats, Cryptography for security, User authentication, Implementing security defenses, Firewalling to protect systems and networks, Computer security classification.
- Case Studies: Linux, Microsoft Windows XP, and Vista.

Text Books:


1. **Silberschatz A, Galvin P B, and Gagne G, Operating System Concepts, 8th edition, Wiley, 2009.**
2. Tanenbaum A S, Modern Operating Systems, 3rd edition, Pearson Education, 2008. (for Interprocess Communication, File systems, and Case studies)

Reference Books:


1. Tanenbaum A S, Woodhull A S, Operating Systems Design and Implementation, 3rd edition, PHI, 2006.
2. Dhamdhere D M, Operating Systems - A Concept-Based Approach, 3rd edition, Tata McGraw-Hill, 2012.
3. **Stallings W, Operating Systems - Internals and Design Principles, 6th edition, Pearson Education, 2009**.
4. Nutt G, Operating Systems, 3rd edition, Pearson Education, 2004.


CS 304

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)MICROPROCESSORS AND INTERFACING

No. of Credits: 4 Instruction Hours/Week: 4
Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Features of 8086 Processor: Brief history, Architecture, Pin diagram, Signal description, Timing diagrams.
- Programming 8086: Programmer's view of 8086, Instruction set, Instruction format, Addressing modes, Intel and AT and T assembly language conventions, Assembly directives.
- Special Architectural Features of 8086: Stack structure and operations, Interrupts and Interrupt handling, DMA and DMA handling, Parameter passing, Handling large programs, MACROS.

**UNIT II**

- Basic System Configuration: Minimum and Maximum modes, 8284 clock generator, 8288 Bus controller, Latches, Buffers, and Transceivers.
- Peripherals and Their Interfacing: Memory and I/O address space, Address decoding schemes, Static and Dynamic memory interfacing, Simple I/O interfacing, Interfacing A/D and D/A converters.

**UNIT III**

- Programmable Peripheral Devices and Their Interfacing: Interfacing Programmable Peripheral Interface (8255), Programmable Interval Timer (8253), USART (8251), Programmable Interrupt Controller (8259A), Programmable DMA Interface (8237), Keyboard and Display Controller (8279), CRT Controller (MC6845).

**UNIT IV**

- 8086 Microprocessor-Based Development System: Introduction, Basic operations, Block diagram of the hardware, Software monitor, Interfacing add-on boards.
- Multi-microprocessor Systems: Interconnection topologies, Software aspects, Numeric Processor (8087), I/O Processor (8089), Bus arbitration and control, Tightly coupled and loosely coupled systems.
- Introduction to Advanced Processors: Features of Intel Pentium, and Core2 Processors.

**UNIT V**

- 8051 Microcontroller: Architecture, Pin diagram, Signal description, Programmers view, Instruction set, Memory and I/O addressing, Microcontroller based system development.
- 80196 Microcontroller: Architecture, Important features.

Text Books:


1. Ray A K, Bhurchandi K M, Advanced Microprocessors and Peripherals, 2nd Edition, Tata McGraw-Hill, 2006.
2. Mazidi M A, Mazidi J G, McKinlay R, Das L B, Microprocessors and Microcontrollers, Pearson Education, 2012.


Reference Books:


1. Manohar G T, Advanced Microprocessors, Pearson Education, 2010.
2. Hall D V, Rao S S S P, Microprocessors and Interfacing, 3rd Edition, Tata McGraw-Hill, 2012.
3. 80196 Microcontroller Family User Manual, INTEL, 1995.
4. 8086 Microprocessor Trainer Kit User and Technical Manuals, VI Micro Systems, Chennai.


CS 305

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)CRYPTOGRAPHY

No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

**UNIT I**

- Introduction to Cryptography and Data Security: Concept of cryptology, Symmetric cryptography, Substitution cipher, Cryptanalysis, Modular arithmetic, Shift cipher, Affine cipher, Concept of stream cipher, Random number generators, One-time pad, Practical stream ciphers.

**UNIT II**

- The Advanced Encryption Standard (AES): Concept of iterative ciphers, DES and its limitations, AES algorithm, Introduction to Galois fields, Internal structure of AES, Decryption.
- Block Ciphers: Electronic Codebook Mode (ECB), Cipher Block Chaining Mode (CBC), Ouput Feedback Mode (OFB), Cipher Feedback Mode (CFB), Counter Mode (CTR), Galois Counter Mode (GCM).

**UNIT III**

- Public-Key Cryptography: Symmetric vs. Asymmetric cryptography, Authenticity of public keys, Public?key algorithms, Key lengths and security levels, Euclidean algorithm, Extended Euclidean algorithm, Euler's Phi function, Fermat's Little theorem, Euler's theorem.
- The RSA Cryptosystem: Encryption and Decryption, Key generation and proof of correctness.
- Public-Key Cryptosystems Based on the Discrete Logarithm Problem: Diffie-Hellman key exchange, The discrete logarithm problem, Security of the Diffie-Hellman key exchange.

**UNIT IV**

- Digital Signatures: The basic principle, The RSA signature scheme, Computational aspects.
- Hash Functions: Integrity of messages, Concept of a hash function, Security requirements of hash Functions, MD4-Family of hash functions, Hash functions from block ciphers, The Secure Hash Algorithm (SHA).

**UNIT V**

- Message Authentication Codes (MACs): The basic principle, HMAC, CBC-MAC, GMAC.
- Key Establishment: Introduction, Key freshness and key derivation, The n2 key distribution problem, Key establishment with a key distribution center, Kerberos, Man-in-the-Middle Attack, Certificates, Public-Key Infrastructures (PKI) and CAs.

Text Book:

- Paar C, Pelzl J, Understanding Cryptography, Springer, 2010.

Reference Books:

1. Mao W, Modern Cryptography - Theory and Practice, Pearson Education, 2004.
2. Stinson D R, Cryptography: Theory and Practice, 3rd edition, Chapman and Hall CRC, 2006.
3. Schneier B, Applied Cryptography, 2nd edition, Wiley, 2006.
4. Goldreich O, Foundations of Cryptography - A Primer, now Publishers, 2005.
5. Pachghare V K, Cryptography and Information Security, PHI, 2009.
6. Pfleeger C P, Pfleeger S L, Security in Computing, 4th edition, Pearson Education, 2009.

CE 316

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)BASICS OF CIVIL ENGINEERING

No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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**UNIT I**

- Building Planning and Architecture: Planning and design of buildings such as residential houses, offices, schools, hospitals, theaters, banks and postal offices. (4 hrs)

- Introduction to Architecture: Importance, Basic building techniques such as Lintel, Cantilever, Arches, Buttress. (1 hr)

**UNIT II**

- Soils, Foundations, and Building Materials: Selection of Site, Objective of a foundation, Site inspection, Soils, Loads on foundations, Essential requirements of a good foundation, Types of foundation, Failure of foundations, and remedial measures. (2 hrs)
- Construction Materials: Bricks, Stones, Cement, Cement concrete, Steel section, Properties of building materials. (3 hrs)

**UNIT III**

- Surveying: Objective of surveying, Types of surveying, Classification of surveying, Principles of surveying, Measurement of distance, Measurement of angles, Leveling, Determination of areas, Contouring, Total station. (3 hrs)
- Basic principles and applications of - Remote sensing, Global Positioning System (GPS), Geographical Information System (GIS). (2 hrs)

**UNIT IV**

- Roads: Introduction, Road transport characteristics, Benefits of a good system of roads, Classification of roads. (2 hrs)
- Bridges: Necessity of bridges, Site investigation, Components of a bridge, Classification of bridges. (2 hrs)

**UNIT V**

- Dams: Necessity and classification of dams, Components of a reservoir. (3 hrs)
- Canals: Necessity and classification of irrigation canals, Canal alignment. (2 hrs)

Text Books:


1. Bhavikatti S S, Elements of Civil Engineering, Vikas Publishing, 2003.
2. Palanichamy M S, Basic Civil Engineering, 3rd Edition, Tata McGraw-Hill, 2000.

Reference Book:

- Gopi S, Basic Civil Engineering, Pearson Education, 2010.

CS 302P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)ALGORITHMS LABORATORY

No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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- At least 10 assignments are to be given covering the topics of the courses, "Design and Analysis of Algorithms", and "Theory of Computation".

CS 303P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)OPERATING SYSTEMS LABORATORY

No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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- At least 10 assignments are to be given covering the topics of the course, "Operating Systems".

CS 304P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)MICROPROCESSORS LABORATORY

No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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- At least 10 assignments are to be given covering the topics of the course, "Microprocessors". Emphasis must be on assignments covering "Interfacing".

CS 307P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - V Semester (CBCS)(With effect from the academic year 2012-13)SEMINAR / TERM PAPER I

No. of Credits: 1
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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- Each student must give a minimum of 2 seminars of at least 15 minutes duration each on technical topics, with the use of slides. In addition, the summaries of the seminars (each 2500 words) must be submitted.

CS 313

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)ARTIFICIAL INTELLIGENCE
No. of Credits: 4 Instruction Hours/Week: 4
Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- The History of AI: Concept of intelligence, Search for Mechanical Intelligence, Evolution of Artificial Intelligence (AI), Systems Approach, Overview of topics.
- Uninformed Search: General state space search, Trees, Graphs and Representation, General Search Paradigms - Depth-First Search, Depth-Limited Search, Iterative Deepening Search, Breadth-First Search, Bi-directional Search, Uniform-Cost Search.
- Informed Search: Best-First Search, N-Queens problem, A* Search, Eight Puzzle problem, Hill Climbing Search, Simulated Annealing, Tabu Search, Constraint Satisfaction, Graph Coloring problem, Constraint Satisfaction algorithms - Generate and Test, Backtracking, Forward Checking and Look Ahead, Min?Conflicts Search.

**UNIT II**

- AI and Games: Two Player Games, The Minimax Algorithm, Tic-Tac-Toe problem, Minimax with Alpha-Beta Pruning, Classical Game AI, Checkers, Chess, Scrabble, Video Game AI, Movement and Path finding, Table Lookup with Offensive and Defensive Strategy, NPC Behavior, Team AI, Real-Time Strategy AI.
- Knowledge Representation (KR): Types and Role of Knowledge, Semantic Nets, Frames, Propositional Logic, First Order Logic (Predicate Logic), Semantic Web, Computational Knowledge Discovery, Ontology, Common Sense.

**UNIT III**

- Machine Learning: Machine Learning Algorithms, Supervised Learning, Decision Trees, Unsupervised Learning, Markov Models and implementation, Nearest Neighbor Classification, 1NN and k?NN Examples.
- Evolutionary Computation: Introduction to Evolutionary Computation, Biological Motivation, Genetic Algorithms, Genetic Programming, Evolutionary Strategies, Differential Evolution.

**UNIT IV**

- Neural Networks I: Concept of Neural Networks, Biological Motivation, Fundamentals of Neural Networks, The Perceptron, Least-Mean-Square (LMS) Learning, Learning with Backpropagation, Probabilistic Neural Networks, Tips for Building Neural Networks.
- Neural Networks II: Unsupervised Learning, Hebbian Learning, Simple Competitive Learning, k-Means Clustering, Adaptive Resonance Theory, Hopfield Auto-Associative Model.

**UNIT V**

- Robotics and AI: Introduction, Taxonomy of Robotics, Hard vs. Soft Robotics, Braitenburg Vehicles, Natural Sensing and Control, Perception with Sensors, Actuation with Effectors, Robotic Control Systems, Simple Control Architectures, Movement Planning, Distributed Robotics.
- Intelligent Agents: Anatomy of an Agent, Agent Properties and AI, Hybrid Agent, Agent Architectures, Types of Architectures, Agent Languages, Agent Communication.
- Biologically Inspired and Hybrid Models: Cellular Automata, Artificial Immune Systems, Artificial Life, Fuzzy Logic, Evolutionary Neural Networks, Ant Colony Optimization, Affective Computing.

Text Book:


- Jones M T, Artificial Intelligence - A Systems Approach, Infinity Science Press, 2008.


Reference Books:


1. Russel S, Norvig P, Artificial Intelligence: A Modern Approach, 3rd edition, Pearson Education, 2010.
2. Rich E, Knight K, Nair S B, Artificial Intelligence, 3rd edition, Tata McGraw-Hill, 2009.
3. Luger G F, Artificial Intelligence, 6th edition, Pearson Education, 2009.
4. Carter M, Minds and Computers: An Introduction to the Philosophy of Artificial Intelligence, Edinburgh University Press, 2007.
5. Coppin B, Artificial Intelligence Illuminated, Jones & Bartlett, 2004.
6. Ertel W, Introduction to Artificial Intelligence, Springer, 2011.

CS 311

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)COMPUTER NETWORKS
No. of Credits: 4 Instruction Hours/Week: 4
Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Computer Networks and the Internet: A services description, Access networks, Circuit Switching and Packet Switching, ISPs and Internet backbones, Delay, Loss, and throughput in Packet-Switched Networks, Protocol layers and their service models, Security threats, History of computer networking and the Internet, Recent developments.
- Application Layer: Network application architectures, Application-layer protocols, The Web and HTTP, Non-persistent and Persistent connections, Cookies, Web caching, FTP, Electronic mail, SMTP, Mail message formats, Mail access protocols, DNS, DNS services, DNS operation, DNS records and messages.

**UNIT II**

- Peer-to-Peer applications, P2P file distribution, Distributed Hash Tables (DHTs), P2P Internet telephony with Skype, Socket programming with TCP, Socket programming with UDP.
- Transport Layer: Transport-layer services, Multiplexing and Demultiplexing, Connectionless transport - UDP, UDP Segment structure and Checksum, Reliable data transfer - principles and protocols, Go-Back-N (GBN), Selective Repeat (SR), Connection-oriented transport - TCP, The TCP segment structure, Round-trip time estimation and timeout, Reliable data transfer, Flow control, TCP connection management, Principles of Congestion control, Causes and the costs of Congestion, Approaches to Congestion control, ATM ABR Congestion control, TCP Congestion control, Fairness.

**UNIT III**

- The Network Layer: Forwarding and Routing, Network service models, Virtual-circuit networks, Datagram networks, Architecture of a Router, Input ports, Switching fabric, Output ports, Queuing, The Internet Protocol (IP), Datagram format, IPv4 addressing, Internet Control Message Protocol

(ICMP), IPv6, IP Security, The Link-State (LS) routing algorithm, The Distance-Vector (DV) routing algorithm, Hierarchical routing, Intra-AS routing in the Internet: RIP and OSPF, Inter-AS Routing: BGP, Broadcast routing algorithms, Multicast algorithms.

- The Link Layer and LANs: Link layer services, Review of Error-Detection and - Correction Techniques, Multiple access protocols, Channel partitioning protocols, Random access protocols, Taking-turns protocols, Local Area Networks (LANs), Link-layer addressing, MAC addresses, Address Resolution Protocol (ARP), Ethernet, Ethernet frame structure, CSMA/CD: Ethernet's Multiple Access protocol, Ethernet technologies, Link-layer switches, Forwarding and Filtering, Self-learning, Properties of Link-Layer switching, Switches Versus Routers, Virtual Local Area Networks (VLANs), The Point-to-Point Protocol (PPP), PPP Data framing, Link virtualization.

**UNIT IV**

- Wireless and Mobile Networks: Wireless links and Network characteristics, WiFi: 802.11 Wireless LANs, The 802.11 Architecture, The 802.11 MAC protocol, The IEEE 802.11 Frame, Mobility in the same IP subnet, Introduction to Bluetooth and WiMAX, Cellular Internet access, Overview of Cellular architecture, Mobility Management - Principles, Addressing, Routing to a Mobile Node, Mobile IP, Routing calls to a mobile user, Handoffs in GSM, Wireless and Mobility - Impact on Higher-layer Protocols.
- Multimedia Networking: Multimedia networking applications, Quality of Service (QoS), Present limitations and Solutions, Audio and Video Compression, Streaming Stored audio and video, Real-Time Streaming Protocol (RTSP), Making the best of the Best-Effort Service, Limitations of Best-Effort Service, Removing Jitter, Recovering from Packet Loss, Distributing Multimedia - Content Distribution Networks, Dimensioning Best-Effort Networks to Provide Quality of Service, Protocols for Real-Time interactive applications, RTP, RTP Control Protocol (RTCP), SIP, H.323, Providing Multiple Classes of Service, Scheduling and Policing Mechanisms, Diffserv, Providing Quality of Service Guarantees, Resource Reservation, Call Admission, Call Setup, Guaranteed QoS in the Internet - Intserv and RSVP.

**UNIT V**

- Security in Computer Networks: Network Security, Secure E-mail, PGP, Securing TCP connections - SSL, Network-Layer Security - IPsec and Virtual Private Networks (VPNs), AH and ESP Protocols, Security Associations, IPsec Datagram, IKE: Key Management in IPsec, Securing Wireless LANs, Wired Equivalent Privacy (WEP), IEEE802.11i, Operational Security - Firewalls and Intrusion Detection Systems.

- Network Management: Introduction to Network Management, Infrastructure for network management, The Internet-Standard Management Framework, Structure of Management Information (SMI), Management Information Base (MIB), SNMP protocol operations and transport mappings, Security and Administration, ASN.l.

Text Book:

- Kurose J F, Ross K W, Computer Networking - A Top-Down Approach, 5th edition, Pearson Education, 2010.

Reference Books:


1. Tanenbaum A S, Wetherall D J, Computer Networks, 5th edition, Pearson Education, 2011.
2. Peterson L L, Davie B S, Computer Networks - A Systems Approach, 5th edition, Morgan Kaufmann, 2011.
3. Forouzan B A, Mosharraf F, Computer Networks - A Top-Down Approach, Tata McGraw-Hill, 2012.
4. Olifer N, Olifer V, Computer Networks - Principles, Technologies, and Protocols for Network Design, Wiley, 2006.

CS 315

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)PRINCIPLES OF PROGRAMMING LANGUAGES

No. of Credits: 3

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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**UNIT I**

- Preliminaries: Programming domains, Language evaluation criteria, Influences on language design, Language categories, Language design trade-offs, Implementation methods, Programming environments.
- Evolution of Major Programming Languages: Pseudocodes, Fortran, Lisp, ALGOL60, COBOL, BASIC, PL/I, APL, SNOBOL, SIMULA 67, ALGOL 68, Prolog, Ada, Smalltalk, C++, Java, Scripting Languages, C#, Hybrid languages.
- Describing Syntax and Semantics: Formal methods of describing syntax, Attribute grammars, Dynamic semantics.
- Introduction to Lexical and Syntax Analysis: Lexical analysis, Syntax analysis - Top-down and Bottom-up parsing.

**UNIT II**

- Names, Bindings, and Scopes: Names, Variables, Concept of binding, Scope, Scope and lifetime, Referencing environments, Named constants.
- Data Types: Primitive data types, Character string types, User-defined ordinal types, Array types, Associative arrays, Record types, Tuple types, List types, Union types, Pointer and reference types, Type checking, Strong typing, Type equivalence.
- Expressions and Assignment Statements: Arithmetic expressions, Overloaded operators, Type conversions, Relational and Boolean expressions, Short-circuit evaluation, Assignment statements, Mixed-mode assignment.

**UNIT III**

- Statement-Level Control Structures: Selection statements, Iterative statements, Unconditional branching, Guarded commands.
- Subprograms: Fundamentals, Design issues, Local referencing environments, Parameter-passing methods, Parameters that are subprograms, Overloaded subprograms, Generic subprograms, Design issues for functions, User-defined overloaded operators, Coroutines.
- Implementing Subprograms: General semantics of calls and returns, Implementing simple subprograms, Implementing subprograms with stack-dynamic local variables, Nested subprograms, Blocks, Implementing dynamic scoping, Implementing parameters that are subprogram names.

**UNIT IV**

- Abstract Data Types and Encapsulation Constructs: Concept of abstraction, Data abstraction, Design issues for abstract data types, Language examples, Parameterized abstract data types, Encapsulation constructs, Naming encapsulations.
- Support for Object-Oriented Programming: Object-oriented programming, Design issues for object-oriented languages, Support for object-oriented programming in - Smalltalk, C++, Java, C#, Ada95, Ruby; Object model of JavaScript, Implementation of object-oriented constructs.
- Concurrency: Subprogram-level concurrency, Semaphores, Monitors, Message passing, Concurrency in Ada 95, Java threads, C# threads, Concurrency in functional languages, Statement-level concurrency.

**UNIT V**

- Exception Handling and Event Handling: Introduction to exception handling, Exception handling in - Ada, C++, Java; Introduction to event handling, Event handling in Java, and C#.

- Functional Programming Languages: Mathematical functions, Fundamentals of functional programming languages, Introduction to - LISP, Scheme, ML, Haskell, F#; Applications of functional languages, Comparison of functional and imperative languages.
- Logic Programming Languages: Introduction to predicate calculus, Predicate calculus and proving theorems, Overview of logic programming, Origins of prolog, Basic elements of prolog, Deficiencies of prolog, Applications of Logic Programming.

Text Book:

- Sebesta R W, Concepts of Programming Languages, 10th Edition, Addison-Wesley, 2013.

Reference Books:


1. Louden K C, Lambert K, Programming Languages - Principles and Practice, 3nd Edition, Course Technology, 2011.
2. Tucker A B, Noonan R E, Programming Languages - Principles and Paradigms, 2nd Edition, Tata McGraw-Hill, 2007.
3. Pratt T W, Zelkowitz M V, and Gopal T V, Programming Languages - Design and Implementation, 4th Edition, Pearson Education, 2006.
4. Ghezzi C, Jazayeri M, Programming Language Concepts, 3rd Edition, Wiley, 1998.
5. Scott M L, Programming Language Pragmatics, 3rd edition, Morgan Kaufmann, 2009.
6. Friedman D P, Wand M, Essentials of Programming Languages, 3rd edition, MIT, 2008.
7. Gabbrielli M, Martini S, Programming Languages: Principles and Paradigms, Springer, 2012.
8. Dowek G, Levy J J, Introduction to the Theory of Programming Languages, Springer, 2011.

CS 314

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)SOFTWARE ENGINEERING
No. of Credits: 3
Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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**UNIT I**

- Software and Software Engineering: Nature of software, Unique nature of WebApps, Software engineering, The software process, Software engineering practice, Software myths.
- Process Models: A generic process model, Process assessment and improvement, Prescriptive process models - Waterfall model, Incremental process models, Evolutionary process models,

Concurrent models; Specialized process models - Component-based development, The formal methods model, Aspect-oriented software development; The unified process, Personal and Team process models, Product and process.

**UNIT II**

- Agile Development: Concept of agility, Agility and cost of change, The agile process, Agility principles, Extreme programming (XP), The XP process, The XP debate, Other agile process models - Adaptive software development, Scrum, Dynamic systems development method, Crystal, Feature driven development, Lean software development, Agile modeling, Agile unified process; A tool set for the agile process.
- Principles that Guide Practice: Software engineering knowledge, Core principles, Principles that guide each framework activity - Communication principles, Planning principles, Modeling principles, Construction principles, Deployment principles.
- Understanding Requirements: Requirements engineering, Establishing the groundwork, Eliciting requirements, - Collaborative requirements gathering, Quality function deployment, Usage scenarios, Elicitation work products; Developing use cases, Building the requirements model, Negotiating and validating requirements.

**UNIT III**

- Requirements Modeling: Scenarios, Information, and Analysis Classes: Requirements analysis, Overall objective and philosophy, Requirements modeling approaches, Scenario-based modeling, UML Use Case, Activity diagram, Swimlane diagrams, Data modeling concepts, Class-based modeling, Class-responsibility-collaborator modeling.
- Requirements Modeling: Flow, Behavior, Patterns, and WebApps: Requirements modeling strategies, Flow-oriented modeling, Creating a behavioral model, Patterns for requirements modeling, Requirements modeling for WebApps

**UNIT IV**

- Design Concepts: Design within the context of software engineering, The design process, Design concepts - Abstraction, Patterns, Modularity, Information hiding, Functional independence, Refinement, Refactoring, Object-oriented design concepts; The design model.- Data design, Architectural design, Interface design, Component-level design, Deployment-level design.
- Architectural Design: Software architecture, Architectural genres, Architectural style, Architectural design, Assessing alternate architectural designs, Architectural complexity, Architectural mapping using data flow.

- Component-level Design: Concept of a component, Designing class based components, Conducting component-level design, Component-level design of WebApps, Designing traditional components, Component-based development.

**UNIT V**

- User Iinterface Design: The golden rules, User interface analysis and design, Interface analysis, Interface design steps, WebApp interface design.
- Pattern-based Design: Design patterns, Pattern-based software design, Architectural patterns, Component- level design patterns, User interface design patterns, WebApps design patterns.
- Webapp Design: WebApps design quality, Design goals, A design pyramid for WebApps, WebApps interface design, Aesthetic design, Content design, Architecture design, Navigation design, Component-level design, Object oriented hypermedia design method.

Text Book:

- Pressman R S, Software Engineering: A Practitioner's Approach, 7th edition, McGraw-Hill, 2010. (Chapters 1 to 13)

Reference Books:


1. Sommerville I, Software Engineering, 9th edition, Pearson Education, 2011.
2. Jalote P, Software Engineering: A Precise Approach, Wiley, 2010.
3. Braude E J, Bernstein M E, Software Engineering: Modern Approaches, 2nd edition, Wiley, 2010.
4. Ghezzi C, Jazayeri M, Mandrioli D, Fundamentals of Software Engineering, 2nd edition, PHI, 2003.
5. Saleh K A, Software Engineering, J Ross Publishing, 2009.
6. Bruegge B, Dutoit A H, Object-Oriented Software Engineering Using UML, Patterns, and Java, 3rd edition, Prentice Hall, 2009.
7. Tsui F, Karam O, Essentials of Software Engineering, 2nd edition, Jones & Bartlett, 2009.
8. Schmidt M E C, Implementing the IEEE Software Engineering Standards, Sams, 2000.
9. Pilone D, Miles R, Head First Software Development, O'Reilly (Shroff), 2008.

10. Bennett S, McRobb S, Farmer R, Object-Oriented System Analysis and Design Using UML, 4nd edition, McGraw-Hill, 2010.
11. Lethbridge T C, Laganiere R, Object-Oriented Software Engineering, 2nd edition, McGraw-Hill, 2005.

CS 312

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)SYSTEMS PROGRAMMING

No. of Credits: 4 Instruction Hours/Week: 4

Instruction Weeks/Semester: 14 ( Lectures:3, Tutorials:1 )

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**UNIT I**

- Background: Introduction, System software and machine architecture, SIC, CISC, RISC architectures.
- Assemblers: Basic assembler functions - A simple SIC assembler, Assembler algorithm and Data structures; Machine-dependent assembler features - Instruction formats and addressing modes, Program relocation; Machine independent assembler features - Literals, Symbol defining statements, Expressions, Program blocks, Control sections and program linking; Assembler design options - One-pass Assemblers, Multi-pass assemblers; Implementation examples - MASM assembler, SPARC assembler, GNU as assembler.

**UNIT II**

- Loaders and Linkers: Basic loader functions - Design of an absolute loader, Simple bootstrap loader; Machine dependent loader features - Relocation, Program linking, Algorithm and data structures for a linking loader; Machine independent loader features - Automatic library search, Loader options; Loader design options - Linkage editor, Dynamic linking, Bootstrap loaders; Implementation examples - MS-DOS linker, SunOS linkers, Cray MPP linker, GNU ld linker.

**UNIT III**

- Macro Processors: Basic macro processor functions - Macro definition and expansion, Macro processor algorithm and data structures; Machine independent macro processor features - Concatenation of macro parameters, Generation of unique labels, Conditional macro expansion, Keyword macro parameters; Macro processor design options - Recursive macro expansion, General purpose macro processors, Macro processing within language translators; Implementation examples - MASM macro processor, ANSI C macro language, GNU m4 macro processor.
- Other System Software: Text editors - Editing process, User interface, Editor structure; Interactive debugging systems - Debugging functions and capabilities, User interface criteria; Integrated development environments - Eclipse IDE Architecture, the core, Parser and lexer, Error recovery, User interface, Basic editor framework, Source viewer configuration, Syntax highlighting, Reconciler.

**UNIT IV**

- Linux Kernel: Overview of kernel, Loadable modules, Timers, Concurrency, Memory allocation, kernel threads, Helper interfaces, Devices and drivers, Interrupt handling, Linux device model.
- Character Drivers: Char Driver Basics, Device Example - System CMOS, Sensing data availability, Talking to the parallel port, RTC subsystem, Pseudo char drivers.
- Serial Drivers: Layered architecture, UART Drivers, TTY Drivers.
- Input Drivers: Input event drivers, Input device drivers.

**UNIT V**

- Universal Serial Bus: USB architecture, Linux-USB subsystem, Driver data structures, Device example - Telemetry card.
- Block Drivers: Storage technologies, Linux block I/O layer, I/O schedulers, Block driver data structures and methods, Device example - Simple storage controller.
- Drivers in User Space: Process scheduling and response times, Accessing I/O regions, Accessing memory regions, User mode SCSI, User mode USB.

Text Books:


1. Beck L L, System Software: An introduction to Systems Programming, 3rd Edition, Pearson Education, 1997.
2. Venkateswaran S, Essential Linux Device Drivers, Pearson Education, 2008.


Reference Books:


1. Dhamdhere D M, System Programming, Tata McGraw-Hill, 2011.
2. Corbet J, Hartman G K, and Rubini A, Linux Device Drivers, 3rd Edition, O'Reilly, 2005.
3. Kong J, Free BSD Device Drivers, No Starch Press, 2012.
4. Orwick P, Smith G, Developing Drivers with the Windows Driver Foundation, Microsoft Press, 2007.
5. Levin J R, Linkers and Loaders, Morgan Kaufmann, 1999.
6. Rosenberg J B, How Debuggers Work: Algorithms, Data Structures and Architecture, Wiley, 1996.

Web Documents:
(for IDE development)

1. http://www.ibm.com/developerworks/opensource/tutorials/os-ecl-commplgin1/os-ecl-commplgin1-pdf.pdf
2. http://www.ibm.com/developerworks/opensource/tutorials/os-ecl-commplgin2/os-ecl-commplgin2-pdf.pdf

HU 316

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)MANAGERIAL ACCOUNTING
No. of Credits: 2
Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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**UNIT I**

- Management Accounting - Definition, Objectives, Scope and Functions.
- Financial Accounting - Introduction, Process, Principles and Concepts.
- Financial Statements - Trading Account, Balancing Process, Profit & Loss Account and Balance Sheet.

**UNIT II**

- Financial Statement Analyses - Trend Percentage Analysis, Ratio Analysis, Fund Flow Statement Analysis, Cash Flow Statement Analysis.

**UNIT III**

- Methods of Depreciation - Straight line, Depletion, Machine Hour Rate, Diminishing Balance, Sum of Digits, Sinking Fund and Insurance Policy Methods.
- Inventory Valuation Methods - FIFO, LIFO, Average Weighted Average, Base Stock and HIFO Methods.

**UNIT IV**

- Capital Budgeting - Pay Back Period, ARR, NPV, PI and IRR Methods.
- Unit Costing - Introduction, Direct Cost Classification and Indirect Cost Classification.
- Introduction to Process Costing, Job Costing and Activity Based Costing.

**UNIT V**

- Marginal Costing - Introduction, Definition, Meaning and BEP Analysis and BEP in units.
- Standard Costing - Introduction, Variance Analysis Material Cost Variance, Material Price Variance, Labor Variance, and Sales Variance.

- Budgetary Control - Introduction and Classification of Budgets, Production, Material / Purchase, Sales, Sales Overhead, Cash and Factory Overheads Budgets. Flexible Budget.

Text Book:

- Pandikumar M P, Management Accounting: Theory and Practice, 1st Edition, Excel Books, 2007. (Unit-I: Chapters 1, 2, and 3; Unit-II: Chapters 5, 6, 7, and 8; Unit-III: Chapters 4, and 11; Unit-IV: Chapters 9, 10, 13, 14, and 18; Unit-V: Chapters 15, 16, and 17;)

Reference Books:

1. Khan M Y, Jain P K, Management Accounting, 4th Edition, Tata McGraw-Hill, 2007.
2. Balakrishnan R, Sivaramakrishnan K, Sprinkle G B, Managerial Accounting, Wiley, 2010.

CS 313P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)ARTIFICIAL INTELLIGENCE LABORATORY

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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At least 10 assignments are to be given covering the topics of the course, "Artificial Intelligence".

CS 311P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)COMPUTER NETWORKS LABORATORY

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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At least 10 assignments are to be given covering the topics of the course, "Computer Networks".

Reference Books:


1. Anderson A, Benedetti R, Head First Networking, O'Reilly (Shroff), 2009.
2. Hunt C, TCP/IP Network Administration, 3rd edition, O'Reilly (Shroff), 2002.


CS 317P

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)SOFT SKILLS LABORATORY

No. of Credits: 1

Instruction Weeks/Semester: 14 Instruction Hours/Week: 2

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At least the following activities are to be undertaken in this lab:

Preparing for a Technical Presentation:

- Literature survey
- Development of reading skills
- Development of listening skills
- Internet browsing
- Vocabulary development
- Effective organization of technical material

Technical Speaking:

- Slide Preparation
- Effective speaking, with proper accent, and intonation.
- Correct pronunciation
- Effective body language
- Interaction with audience

Technical Writing:

- Effective technical writing
- Preparing effective e-mails
- Preparing effective curriculum vitae

Team Activities:

- Debate
- Group discussion
- Brain storming

SRI VENKATESWARA UNIVERSITY::TIRUPATIB Tech (CSE) - VI Semester (CBCS)(With effect from the academic year 2012-13)SYSTEMS PROGRAMMING LABORATORY

No. of Credits: 2

Instruction Weeks/Semester: 14 Instruction Hours/Week: 3

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At least 10 assignments are to be given covering the topics of the course, "Systems Programming".

CS 401

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**COMPUTER ETHICS**

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 2

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**UNIT I**

An Overview of Ethics: Introduction, Morals, Ethics, Laws, Ethics in the business world, Ethics in information technology.

Ethics for IT Workers and IT Users: Nature of IT profession, Professional relationships, Concept of professional code of ethics, Certification, IT professional malpractice, Common ethical issues for IT users, Supporting the ethical practices.

**UNIT II**

Computer and Internet Crime: IT security incidents, Laws for prosecuting computer attacks, Implementing trustworthy computing,

Privacy: Information privacy, Privacy laws, Key privacy and anonymity issues – Identity theft, Consumer profiling, Workplace monitoring, Advanced surveillance technology.

UNIT III

Freedom of Expression: Free speech issues and laws, Controlling access to information on the Internet, Anonymity on the internet, Defamation and hate speech, Corporate blogging, Pornography.

Intellectual Property: Concept of intellectual property, Copyright, Software copyright protection, International and National agreements and laws, Patents, Trade secrets, Plagiarism, Reverse engineering, Open source code, Competitive intelligence, Trademark infringement, Cyber squatting.

**UNIT IV**

Software Development: The importance of software quality, Software product liability, Development of safety-critical systems, Quality management standards.

The Impact of IT on Productivity and Quality of Life: IT investment and productivity, The digital divide, The impact of IT on healthcare costs.

**UNIT V**

Social Networking: Introduction, Business applications of online social networking, Ethical issues in social networking, Online virtual worlds.

Ethics of IT Organizations: Key ethical issues for organizations, Outsourcing, Whistle-blowing, Green computing.

Codes of Ethics: ACM/IEEE Software engineering code of ethics, IE(India) code of ethics, CSI code of ethics.

Government Regulation: Indian IT act 2000, IT(Amendment act) 2008.

**Text Book:**

Reynolds G, *Ethics in Information Technology*, 4th edition, Cengage Learning, 2012.

**Reference Books:**


1. Johnson D G, *Computer Ethics*, 4th edition, Pearson, 2009.
2. Martin M, Schinzinger R, *Introduction to Engineering Ethics*, 2nd edition, McGraw Hill, 2010.
3. Harris Jr. C E, Pritchard M S, Rabins M J, *Engineering Ethics: Concepts and Cases*, 4th edition, Wadsworth, 2008.
4. Govindarajan M, Natarajan S, Senthilkumar V S, *Engineering Ethics*, PHI, 2009.
5. Reddy G B, *Constitution of India & Professional Ethics*, I K International, 2011.
6. Floridi L, *Information and Computer Ethics*, Cambridge University Press, 2010.
7. Balachandran S, Raja K C R, Nair B K, *Ethics, Indian Ethos and Management*, Shroff Publishers, 2008.


**Web Documents:**

1. http://computerethicsinstitute.org/
2. http://en.wikipedia.org/wiki/Computer_ethics
3. http://www.acm.org/about/se-code
4. http://www.ieindia.org/archive.aspx
5. http://www.csi-india.org/web/guest/code-of-ethics
6. http://deity.gov.in/content/cyber-laws

CS 402

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

# COMPILER CONSTRUCTION

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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UNIT I

Introduction: Language Processors, The Structure of a Compiler, The Evolution of Programming Languages, The Science of Building a Compiler, Applications of Compiler Technology, Programming Language Basics.

A Simple Syntax-Directed Translator: Introduction, Syntax Definition, Syntax-Directed Translation, Parsing, A Translator for Simple Expressions, Lexical Analysis, Symbol Tables, Intermediate Code Generation.

Lexical Analysis: The Role of the Lexical Analyzer, Input Buffering, Specification of Tokens, Recognition of Tokens, The Lexical-Analyzer Generator Lex, Finite Automata, From Regular Expressions to Automata, Design of a Lexical-Analyzer Generator, Optimization of DFA-Based Pattern Matchers.

UNIT II

Syntax Analysis: Introduction, Context-Free Grammars, Writing a Grammar, Top-Down Parsing, Bottom-Up Parsing, Introduction to LR Parsing: Simple LR, More Powerful LR Parsers, Using Ambiguous Grammars, Parser Generators.

UNIT III

Syntax-Directed Translation: Syntax-Directed Definitions, Evaluation Orders for SDD's, Applications of Syntax-Directed Translation, Syntax-Directed Translation Schemes, Implementing L-Attributed SDD's.

Intermediate-Code Generation: Variants of Syntax Trees, Three-Address Code, Types and Declarations, Translation of Expressions, Type Checking, Control Flow, Backpatching, Switch-Statements, Intermediate Code for Procedures.

UNIT IV

Run-Time Environments: Storage Organization, Stack Allocation of Space, Access to Nonlocal Data on the Stack, Heap Management, Introduction to Garbage Collection, Introduction to Trace-Based Collection, Short-Pause Garbage Collection, Advanced Topics in Garbage Collection.

Code Generation: Issues in the Design of a Code Generator, The Target Language, Addresses in the Target Code, Basic Blocks and Flow Graphs, Optimization of Basic Blocks, A Simple Code Generator, Peephole Optimization, Register Allocation and Assignment, Instruction Selection by Tree Rewriting, Optimal Code Generation for Expressions, Dynamic Programming Code-Generation.

UNIT V

Machine-Independent Optimizations: The Principal Sources of Optimization, Introduction to Data-Flow Analysis, Foundations of Data-Flow Analysis, Constant Propagation, Partial-Redundancy Elimination, Loops in Flow Graphs, Region-Based Analysis, Symbolic Analysis.

Instruction-Level Parallelism: Processor Architectures, Code-Scheduling Constraints, Basic-Block Scheduling, Global Code Scheduling, Software Pipelining.

Optimizing for Parallelism and Locality: Basic Concepts, Matrix Multiply: An In-Depth Example, Iteration Spaces, Affine Array Indexes, Data Reuse, Array Data-Dependence Analysis, Finding Synchronization-Free Parallelism, Synchronization Between Parallel Loops, Pipelining, Locality Optimizations, Other Uses of Affine Transforms.

Inter-procedural Analysis: Basic Concepts, Why Interprocedural Analysis, A Logical Representation of Data Flow, A Simple Pointer-Analysis Algorithm, Context-Insensitive Interprocedural Analysis, Context-Sensitive Pointer Analysis, Datalog Implementation by BDD's.

**Text Book:**

Aho A V, Sethi R, and Ullman J D, *Compilers-Principles, Techniques and Tools*, 2nd edition, Pearson Education, 2006.

**Reference Books:**

1. Raghavan V, *Principles of Compiler Design*, Tata McGraw Hill, 2010.
2. Grune D, Bal H E, Jacobs C J H, and Langendoen K G, *Modern Compiler Design*, Wiley, 2000.
3. Appel A W, *Modern Compiler Implementation in C*, Cambridge University Press, 2000.

CS 403

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

# SOFTWARE QUALITY MANAGEMENT

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 2

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## UNIT I

Quality Concepts: Software quality, Cost and the risks, Achieving software quality.

Review Techniques: Cost impact of software defects, Defect amplification and removal, Review metrics and their use, Informal reviews, Formal technical reviews.

## UNIT II

Software Quality Assurance (SQA): Elements of software quality assurance, SQA tasks, goals and metrics, Formal approaches to SQA, Statistical SQA, Software reliability, The ISO 9000 quality standards, The SQA plan.

Software Testing Strategies: A strategic approach to software testing, Strategic issues, Test strategies for - Conventional software, Object-oriented software, WebApps; Validation testing, System testing, The art of debugging.

## UNIT III

Testing Conventional Applications: Software testing fundamentals, Internal and external views of testing, White-box testing, Basis path testing, Control structure testing, Black-box

testing, Model-based testing, Testing for specialized environments, architectures, and applications, Patterns for software testing.

Testing Object-Oriented Applications: Testing OOA and OOD models, Object-oriented testing strategies, Object-oriented testing methods, Testing methods at Class level, Inter-class test case design.

**UNIT IV**

Testing Web Applications: Testing concepts for WebApps, Overview of testing process, Content testing, User interface testing, Component-level testing, Navigation testing, Configuration testing, Security testing, Performance testing.

Formal Modeling and Verification: The cleanroom strategy, Functional specification, Cleanroom Design, Cleanroom testing, Formal methods concepts, Applying mathematical notation for formal specification, Formal specification languages.

**UNIT V**

Software Configuration Management (SCM): Introduction, The SCM repository, The SCM process, Configuration management for WebApps.

Product Metrics: A framework for product metrics, Metrics for - the requirements model, the design model; Design metrics for WebApps, Metrics for – Source code, Testing, and Maintenance.

**Text Book:**

Pressman R S, *Software Engineering - A Practitioner's approach*, 7th Edition McGraw-Hill, 2010. (Quality Management – Chapters 14 to 23)

**Reference Books:**


1. Desikan S, Ramesh G, *Software Testing – Principles and Practices*, Pearson, 2006.
2. Galin D, *Software Quality Assurance: From Theory to Implementation*, Pearson, 2004.
3. Singh Y, *Software Testing*, Cambridge University Press, 2012.
4. Limaye M G, *Software Testing*, Tata McGrw Hill, 2009.
5. Jalote P, *Software Engineering*, Wiley, 2010.
6. Riley T, Goucher A, Beautiful Testing, Shroff Publishers, 2010.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

# MANAGERIAL ECONOMICS

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 2

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## UNIT I

Introduction - Nature and Scope of Managerial Economics, Economic Theory and Managerial Economics, Managerial Economist: Role and Responsibilities.

Demand Analysis and Forecasting – Demand Determinants, Demand Distinctions, Demand Forecasting: General Considerations, Methods of Demand Forecasting.

## UNIT II

Cost Analysis – Cost Concepts, Classifications and Determinants; Cost-Output Relationship, Economies and Diseconomies of Scale, Cost Control and Cost Reduction.

Production and Supply Analysis – Production Functions, Supply Analysis.

## UNIT III

Price and Output Decisions Under Different Market Structures – Perfect Competition, Monopoly and Monopsony; Price Discrimination, Monopolistic Competition, Oligopoly and Oligopsony.

**UNIT IV**

Pricing Policies and Practices – Pricing Policies, Pricing Methods, Specific Pricing Policies, Price Discounts and Differentials; Product-line Coverage and Pricing; Price Forecasting.

**UNIT V**

Profit Management – Nature of Profit, Measuring Accounting Profit, Profit Policies, Profit Planning and Forecasting.

Capital Management - Capital Budgeting, Cost of Capital, Appraising Project Profitability, Risk, Probability and Investment Decisions.

**Text Book:**

Varshney R L and Maheshwari K L, *Managerial Economics*, 19th Edition, Sultan Chand and Sons, 2009.

**Reference Books:**

1. Froeb L M, and McCann B T, *Managerial Economics: A Problem Solving Approach*, Cengage Learning, 2008.
2. Dean J, *Managerial Economics*, PHI, 2010.
3. Aryasri A R, Managerial Economics and Financial Analysis, 3rd edition, Tata McGraw Hill, 2008.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

# COMPILER CONSTRUCTION LABORATORY

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 3

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At least 6 assignments are to be given covering the topics of the course, "Compiler Construction". A mini project is to be undertaken to implement a simple compiler.

**Reference Book:**

Mak R, *Writing Compilers and Interpreters*, 3rd edition, Wiley, 2009.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**OBJECT ORIENTED SYSTEMS LABORATORY**

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 3

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At least 8 assignments are to be given covering the topics related to "Object Oriented Software Engineering Principles", and "Software Testing".

**Reference Books:**


1. Eriksson H E, Penker M, Lyons B, Fado D, *UML 2 Toolkit*, Wiley, 2004.
2. Shende R, *Software Automation Testing Tools*, Shroff Publishers, 2012.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**PROJECT WORK Part-I**

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 3

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Students, not exceeding four per batch, shall pursue either research-oriented or application-oriented Project Work. The steps to be followed in executing the Part-I of the Project Work are given below:

| Research-Oriented Project Work | Application-Oriented Project Work |
|---|---|
| 1. Motivation<br>2. Literature Survey<br>3. Problem Definition<br>4. Model Formulation | 1. Motivation<br>2. Problem Definition<br>3. Feasibility Study<br>4. Software Requirements Analysis |

At the end of the semester, a Preliminary Report shall be prepared and submitted for evaluation.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - V SEMESTER (CBCS)**

**(With effect from the academic year 2012 – 13)**

**SEMINAR / TERM PAPER-II**

No. of Credits: 1

Instruction Weeks / Semester: 14 Instruction Hours / Week: 2

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Each student must give a minimum of 2 seminars of at least 15 minutes duration each on technical topics, with the use of slides. In addition, the summaries of the seminars (each 2500 words) must be submitted.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**COMPREHENSIVE VIVA VOCE - II**

No. of Credits: 1

Instruction Weeks / Semester: 14 Instruction Hours / Week: NIL

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The scope of the viva encompasses everything the student is expected to have learned until the end of VII semester. More emphasis is placed on basics and fundamental concepts.

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VIII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**SOFTWARE PROJECT MANAGEMENT**

No. of Credits: 3

Instruction Weeks / Semester: 14 Instruction Hours / Week: 3

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**UNIT I**

Project Management Concepts: The management spectrum – People, The product, The process, The project; The $W^5HH$ principle, Critical Practices.

Process and Project Metrics: Introduction, Software measurement, Software quality metrics, Integrating metrics within the software process, Metrics for small organizations.

UNIT II

Estimation for Software Projects: Introduction, Project planning process, Software scope and feasibility, Resources, Software project estimation, Decomposition techniques, Empirical estimation models, Estimation for object-oriented projects, Specialized estimation techniques, The make/buy decision.

UNIT III

Project Scheduling: Basic concepts, Principles, Defining a task set for software project, Defining a task network, Scheduling, Earned value analysis.

Risk Management: Reactive versus proactive risk strategies, Software risks, Risk identification, Risk projection, Risk refinement, Risk mitigation, monitoring and management, RMMM plan.

UNIT IV

Maintenance and Reengineering: Software maintenance, Software supportability, Reengineering, Business process reengineering, Software reengineering, Reverse engineering, Restructuring, Forward engineering, Economics of reengineering.

Software Process Improvement (SPI): Introduction, SPI process, CMMI, The people CMMI, Other SPI frameworks, SPI return on investment, SPI trends.

**UNIT V**

Emerging Trends in Software Engineering: Technology evolution, Software engineering trends, Identifying soft trends, Technology directions, Tools-related trends.

**Text Book:**

Pressman R S, *Software Engineering - A Practitioner's approach*, 7th Edition McGraw-Hill, 2010. (Quality Management – Chapters 24 to 32)

**Reference Books:**


1. Jacobson I, Christerson M, Jonsson P, *Object Oriented Software Engineering: A Use Case Driven Approach*, Pearson, 1992.
2. Hughes B, Cotterell M, Mall R, *Software Project Management*, 5th edition, Tata McGrwa Hill, 2011.
3. Royce W, *Software Project Management*, Pearson, 1998.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VIII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**INDUSTRIAL MANAGEMENT**

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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**UNIT I**

Definition of management, Management functions, Management administration, Nature of management, Universality of management, Principles of management, Organization approaches, Organization structures and process of organizing.

Nature and scope of financial management, Capital budgeting, Cost of capital and working capital management.

**UNIT II**

Facilities Planning: Definition, Significance, Objectives and process, Location models, Plant location Problem and Basic layout.

Material Handling: Definition, Principles, System design, Equipment.

Process Design: Identifying, Selecting and Sequencing the required processes.

**UNIT III**

Aggregate production planning, Material requirement planning, Project planning and scheduling.

**UNIT IV**

Job sequencing and Operations scheduling, New direction in batch and discrete parts and production systems and plant maintenance.

Purchasing: Objectives, Responsibilities, Policies, Practices, Procedures, Organization for purchasing, Relationship of purchasing with other departments.

**UNIT V**

Marketing Management: Nature and functions of marketing, Distribution channels and marketing research.

Human Resource Development, Dynamic personal management, Staffing policies and processes, Wages and salary policies and administration.

**Text Books:**


1. R D Aggarwal, *Organization and Management*, Tata McGraw-Hill.
   (Chapters: 1, 7, 8, 24, 26, 31, 36, 37, 41 to 46)
2. O P Khanna, *Industrial Engineering and Management*, Dhanpat Roy Publications.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VIII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

# SOFTWARE PROJECT MANAGEMENT LABORATORY

No. of Credits: 2

Instruction Weeks / Semester: 14 Instruction Hours / Week: 3

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At least 6 assignments are to be given covering the topics of the course, "Software Project Management".

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VIII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**PROJECT WORK Part-II**

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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In the current semester, the Project work started in the previous semester shall be continued. The steps of the Project work part –II shall be as follows:

| Research-Oriented Project Work | Application-Oriented Project Work |
|---|---|
| 5. Algorithm Development | 5. Software Design |
| 6. Illustrative Example | 6. Test Case Design |
| 7. Performance Analysis | 7. Coding |
| 8. Performance Measurement | 8. Testing |
| 9. Results and Conclusions | 9. Conclusions |

At the end of the current semester, a Comprehensive Report of the Project Work shall be prepared and submitted for evaluation.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VIII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**SEMINAR / TERM PAPER-III**

No. of Credits: 1

Instruction Weeks / Semester: 14 Instruction Hours / Week: 2

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Each student must give a minimum of 2 seminars of at least 15 minutes duration each on technical topics, with the use of slides. In addition, the summaries of the seminars (each 2500 words) must be submitted.

CS 418P

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - VIII SEMESTER (CBCS)**

**(With effect from the academic year 2013 – 14)**

**COMPREHENSIVE VIVA VOCE - III**

No. of Credits: 1

Instruction Weeks / Semester: 14 Instruction Hours / Week: NIL

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The scope of the viva encompasses everything the student is expected to have learned until the end of VIII semester. More emphasis is placed on basics and fundamental concepts.

**(Detailed Syllabus of B Tech (CSE) Elective courses)**

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - ELECTIVE (CBCS)**

**(With effect from the academic year 2013 – 14)**

# EMBEDDED SYSTEMS

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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## UNIT I

Embedded Systems Landscape: Embedded system - Architecture, Classification, Applications.

Attributes of Embedded Systems: Characteristics – CPU, Integration level, Power consumption, Form factor, Expansion, Application specific hardware, Certification, Reliability, User interfaces, Connectivity, Security.

The Future of Embedded Systems: Technology Trends - Computation, Connectivity, Storage, Sensing; Issues, Applications, and Initiatives - Energy, Security, Health; Challenges and Uncertainties - Open Systems, Internet Access, Neutrality, Privacy, Successful Commercialization.

Embedded Platform Architecture: Platform Overview, Volatile Memory Technologies, Nonvolatile Storage, Device Interface - High Performance, Universal Serial Bus, Device Interconnect—Low Performance, General-Purpose Input/Output, Power Delivery.

## UNIT II

Embedded Processor Architecture: Basic Execution Environment, Application Binary Interface,

Processor Instruction Classes, Exceptions/Interrupts Model, Vector Table Structure, Masking Interrupts

Acknowledging Interrupts, Interrupt Latency, Memory Mapping and Protection, Memory Management Unit, MMU and Processes, Memory Hierarchy, Intel Atom Microarchitecture,

Embedded Platform Boot Sequence: Multi-Core and Multi-Processor Boot, Boot Technology considerations, Hardware Power Sequences, Reset, Early Initialization, AP Processor Initialization

Advanced Initialization.

UNIT III

Operating Systems Overview: Application Interface, Processes, Tasks, and Threads Scheduling, Memory Allocation, Clocks and Timers, Mutual Exclusion/Synchronization, Device Driver Models, Bus Drivers, Networking, Storage File Systems, Power Management, Real Time, Licensing.

Embedded Linux: Tool Chain, Anatomy of an Embedded Linux, Building a Kernel, Debugging, Driver Development, Memory Management, Synchronization/Locking.

**UNIT IV**

Power Optimization: Power Basics, The Power Profile of an Embedded Computing System, Constant Versus Dynamic Power, A Simple Model of Power Efficiency, Advanced Configuration and Power Interface (ACPI), Optimizing Software for Power Performance.

Embedded Graphics and Multimedia Acceleration: Screen Display, Embedded Panels, Graphics Stack,

Accelerated Media Decode, Video Capture and Encoding, Media Frameworks

Application Frameworks: Overview, Android architecture, Qt application development framework.

Advanced Topics: SMP, AMP, and Virtualization: Multiprocessing Basics, Symmetric Multiprocessing,

Asymmetric Multiprocessing, Virtualization Basics, Methods for Platform Virtualization.

**UNIT V**

Example Designs: Intel Atom E6XX Series Platforms, Multi-Radio Communications Design, Multimedia Design.

Platform Debug: A Process for Debugging a New Platform, Debug Tools and Chipset Features - Logic Analyzers, Power-On Self-Test (POST) Cards, JTAG Adapters, Debug Process Details.

Performance Tuning: Patterns, General Approaches - Performance Design, Compiler optimizations, Data Cache; Code and Design - Fast Interrupt Service Routines, Assembly-Language-Critical Functions, Inline Functions, Cache-Optimizing Loop, Minimizing Local Variables, Register optimizations, Avoiding the OS Buffer Pool, C Language Optimizations, Disabled Counters/Statistics; Processor-Specific - Stall Instructions, Profiling Tools, Prefetch Instructions, Separate DRAM Memory Banks, Line-Allocation Policy, Cache Write Policy, Cache-Aligned Data Buffers, On-Chip Memory, Optimized Libraries; Networking Techniques - Bottleneck Hunting, Evaluating Traffic Generator and Protocols, Environmental Factors.

**Text Book:**

Barry P, Crowley P, Modern Embedded Computing, Elsevier, 2012.

**Reference Books:**

1. Ball S R, *Embedded Microprocessor Systems – Real World Design*, 3rd Edition, Newnes, 2002.
2. Simon D E, *An Embedded Software Primer*, Pearson Education, 1999.
3. Raj Kamal, *Embedded Systems – Architecture, Programming and Design*, 2nd Edition, Tata McGraw-Hill, 2008.
4. Ganssle J, et al, *Embedded Hardware – Know It All*, Newnes, 2008.
5. Raghavan P, Lad A, Neelakandan S, *Embedded Linux System Design and Development*, Auerbach Publications, 2006.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - ELECTIVE (CBCS)**

**(With effect from the academic year 2013 – 14)**

# ADVANCED OPERATING SYSTEMS

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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## UNIT I

Distributed systems – Introduction, Hardware concepts, Software concepts and Design issues.

Layered protocols, Asynchronous transfer mode networks, Client server model, Remote procedure call, Group communication.

## UNIT II

Clock synchronization, Mutual exclusion, Election algorithms, Atomic transactions, Deadlocks in distributed systems.

Threads, System models, Processor allocation, Scheduling in distributed systems.

## UNIT III

Fault tolerance, Real-time distributed systems, Distributed file systems – Design, Implementation and Trends.

Distributed shared memory – Introduction and shared memory concept.

## UNIT IV

DSM Consistency models, Page-based distributed shared memory.

Case study Amoeba – Introduction, Objects and capabilities, Process management, Memory management, Communication and Servers.

**UNIT V**

Multimedia operating systems – Introduction, Multimedia files, Video compression, Audio compression, Multimedia process scheduling, Multimedia file system paradigms, File placement, Caching, Disk scheduling for multimedia.

**Text Books:**


1. Tanenbaum A S, *Distributed Operating Systems*, Pearson Education, 2005.
2. Tanenbaum A S, *Modern Operating Systems*, 3rd Edition, Pearson Education, 2008. (for Unit V)


**Reference Books:**


1. Sinha P K, *Distributed Operating Systems: Concepts and Design*, Prentice-Hall of India Pvt Ltd, 2005.
2. Coulouris G, Dollimore J, and Kindberg T, *Distributed System Concepts and Design*, 4th Edition, Pearson Education, 2005.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - ELECTIVE (CBCS)**

**(With effect from the academic year 2013 – 14)**

# ADVANCED COMPUTER ARCHITECTURE

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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## UNIT I

**Fundamentals of Computer Design:** Introduction, Classes of Computers, Defining Computer Architecture, Trends in Technology, Trends in Power in Integrated Circuits, Trends in Cost, Dependability; Measuring, Reporting, and Summarizing Performance; Quantitative Principles of Computer Design, Performance and Price-Performance.

**Instruction-Level Parallelism and Its Exploitation:** Instruction-Level Parallelism (ILP): Concepts and Challenges, Basic Compiler Techniques for Exposing ILP, Reducing Branch Costs with Prediction, Overcoming Data Hazards with Dynamic Scheduling, Dynamic Scheduling: Examples and the Algorithm, Hardware-Based Speculation, Exploiting ILP Using Multiple Issue and Static Scheduling; Exploiting ILP Using Dynamic Scheduling, Multiple Issue, and Speculation; Advanced Techniques for Instruction Delivery and Speculation, The Intel Pentium 4.

## UNIT II

**Limits on Instruction-Level Parallelism:** Introduction, Studies of the Limitations of ILP, Limitations on ILP for Realizable Processors, Hardware versus Software Speculation, Multithreading: Using ILP Support to Exploit Thread-Level Parallelism, Performance and Efficiency in Advanced Multiple-Issue Processors.

**Vector Processors:** Need for Vector Processors, Basic Vector Architecture, Two Real-World Issues: Vector Length and Stride, Enhancing Vector Performance, Effectiveness of Compiler Vectorization, Performance of Vector Processors, A Modern Vector Supercomputer: The Cray X1.

UNIT III

**Hardware and Software for VLIW and EPIC:** Introduction: Exploiting Instruction-Level Parallelism Statically, Detecting and Enhancing Loop-Level Parallelism, Scheduling and Structuring Code for Parallelism, Hardware Support for Exposing Parallelism: Predicated Instructions, Hardware Support for Compiler Speculation, The Intel IA-64 Architecture and Itanium Processor.

**Multiprocessors and Thread-Level Parallelism:** Introduction, Symmetric Shared-Memory Architectures, Performance of Symmetric Shared-Memory Multiprocessors, Distributed Shared Memory and Directory-Based Coherence, Synchronization: The Basics, Models of Memory Consistency: An Introduction, The Sun T1 Multiprocessor.

**UNIT IV**

Large-Scale Multiprocessors and Scientific Applications: Introduction, Interprocessor Communication: The Critical Performance Issue, Characteristics of Scientific Applications, Synchronization: Scaling Up, Performance of Scientific Applications on Shared-Memory Multiprocessors, Performance Measurement of Parallel Processors with Scientific Applications, Implementing Cache Coherence, The Custom Cluster Approach: Blue Gene/L.

Interconnection Networks: Introduction, Network Topology, Network Routing, Arbitration, and Switching, Switch Micro-architecture, Practical Issues for Commercial Interconnection Networks, Examples of Interconnection Networks, Internetworking.

**UNIT V**

**Memory Hierarchy Design:** Introduction, Advanced Optimizations of Cache Performance, Memory Technology and Optimizations, Protection: Virtual Memory and Virtual Machines, The Design of Memory Hierarchies, AMD Opteron Memory Hierarchy.

**Storage Systems:** Introduction, Advanced Topics in Disk Storage, Definition and Examples of Real Faults and Failures, I/O Performance, Reliability Measures, and Benchmarks, Designing and Evaluating an I/O System—The Internet Archive Cluster, NetApp FAS6000 Filer.

**Text Book:**

Hennessy J L, Patterson D A, *Computer Architecture: A Quantitative Approach*, 4th edition, Morgan Kaufmann Publishers, 2007. (Chapters 1-6, and Appendices E, F, G, and H)

**Reference Books:**

1. Sima D, Fountain T, Kacsuk P, *Advanced Computer Architectures*, Pearson Education, 1997.

2. Grama A, Guptha A, Karypis G, Kumar V, *Introduction to Parallel Computing*, 2nd edition, Pearson Education, 2003.
3. Jordan H F, Alaghband G, *Fundamentals of Parallel Processing*, Prentice-Hall of India Ltd, 2003.
4. Dongarra J, Foster I, Fox G, Gropp W, Kennedy K, Torczon L, and White A, Morgan, *Source Book of Parallel Computing*, Kaufmann Publishers, 2003.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - ELECTIVE (CBCS)**

**(With effect from the academic year 2013 – 14)**

# CLOUD COMPUTING

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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## UNIT I

Introduction: Definition, Historical developments, Computing platforms and technologies.

Principles of Parallel and Distributed Computing: Parallel versus distributed computing, Elements of parallel computing, Elements of distributed computing, Technologies for distributed computing.

## UNIT II

Virtualization: Characteristics, Virtualization techniques, Virtualization and cloud computing, Pros and cons of virtualization, Technology examples.

Cloud Computing Architecture: Cloud reference model, Types of clouds, Economics of clouds, Open challenges.

Aneka: Cloud Application Platform: Framework overview, Anatomy of the Aneka container, Building Aneka clouds, Cloud programming and management.

UNIT III

Concurrent Computing- Thread Programming: Programming applications with threads, Multithreading with Aneka, Programming applications with Aneka threads.

High Throughput Computing- Task Programming: Task computing, Task-based application models, Aneka task-based programming.

**UNIT IV**

Data Intensive Computing – Map-Reduce Programming: Introduction, Technologies for data-intensive computing, Aneka MapReduce programming.

Cloud Platforms in Industry: Amazon web services, Google AppEngine, Microsoft Azure.

**UNIT V**

Cloud Applications: Scientific applications in – Healthcare, Biology, Geo-science; Business applications in – CRM and ERP, Productivity, Social networking, Media applications, Multiplayer online gaming.

Advanced Topics in Cloud Computing: Energy efficiency in clouds, Market based management of clouds, Federated clouds / InterCloud, Third party cloud services.

**Text Book:**

Buyya R, Vecchiola C, Selvi S T, *Mastering Cloud Computing*, McGraw Hill Education (India), 2013.

**Reference Books:**

1. Buyya R, Broberg J, Goscinski A, *Cloud Computing - Principles and Paradigms*, Wiley, 2011.
2. Rittinghouse J W, Ransome J F, *Cloud Computing - Implementation, Management, and Security*, CRC Press, 2010.
3. Velte A T, Velte T J, *Cloud Computing - A Practical Approach*, McGraw Hill, 2011.
4. Shroff G, *Enterprise Cloud Computing - Technology, Architecture, Applications*, Cambridge University Press, 2010.
5. Antonopoulos N, Gillam L, *Cloud Computing - Principles, Systems and Applications*, Springer, 2010.
6. Furht B, Escalante A, *Handbook of Cloud Computing*, Springer, 2010.
7. Sosinsky B, *Cloud Computing Bible*, Wiley, 2011.
8. Joseph J, Fellenstein C F, *Grid Computing*, Pearson, 2004.

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**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - ELECTIVE (CBCS)**

**(With effect from the academic year 2013 – 14)**

# DIGITAL SIGNAL PROCESSING

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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## UNIT I

Fundamentals of DSP: Classification of signals, Discrete time signals, Signal processing operations.

Discrete Time Signals and Systems: Discrete Time (DT) signals, Discrete time systems, Operations on DT signals, Convolution, Properties of LTI systems, Importance of LTI systems.

Sampling: Sampling theorem, Aliasing, Quantization, A/D and D/A conversion, Signal reconstruction from samples, Anti-aliasing and Reconstruction filters.

## UNIT II

Z Transform: Definition, Properties, Concept of ROC, Inverse Z-transform, Applications, Relation between Laplace transform and Z transform.

Discrete Fourier Transform: Concept of Fourier series, and Fourier Transform, Sampling in Frequency domain, Discrete Fourier transform, Properties of DFT, FFT, Spectral resolution and selection of window function.

Linear Time-Invariant Filter Realization: FIR and IIR systems, FIR system structures, IIR system structures.

UNIT III

Digital Filters: Ideal filter requirements, Practical filter specifications, Characteristics of FIR and IIR filters, Merits and demerits of FIR and IIR filters, Applications of FIR and IIR filters.

FIR Filter Design: FIR filter design using – Fourier series expansion method, Windowing method, Frequency sampling method.

IIR Filter Design: IIR filter design using – Method of mapping differentials, Impulse invariance, Bilinear transformation method.

**UNIT IV**

Adaptive Digital Filters: Concept of adaptive filtering, The basic LMS adaptive algorithm, Applications of adaptive filters in – Filtering noise, Echo cancellation.

Spectrum Estimation and Analysis: Principles of Spectrum estimation, Traditional methods – Windowing, The Periodogram method; Parametric estimation methods – Autoregressive spectral estimation.

**UNIT V**

Digital Signal Processors: Digital signal processor architecture, Multiple access memory and multiport memory, Circular buffering, Study of TMS320C6713 digital signal processor, VLSI architectures for DSP algorithms.

Speech Signal Processing: Speech production, Speech perception, LPC modeling of speech, LPC speech analysis, LPC speech synthesis, Speech compression, CELP coders, Telephone-grade speech coding.

**Text Books:**


1. Apte S D, *Digital Signal Processing*, 2nd edition, Wiley, 2009.
2. Ifeachor E, Jervis B W, *Digital Signal Processing*, 2nd edition, Pearson, 2002.


**Reference Books:**


1. Stein J Y, *Digital Signal Processing: A Computer Science Perspective*, John Wiley, 2000.
2. Oppenheim A V, and Schafer R W, *Discrete-time Signal Processing*, 3rd edition, Pearson, 2009.
3. Salivahanan S, Vallavaraj A, and Gnanapriya C, *Digital Signal Processing*, TMH, 2008.

CS 463

**SRI VENKATESWARA UNIVERSITY :: TIRUPATI**

**B.Tech (CSE) - ELECTIVE (CBCS)**

**(With effect from the academic year 2013 – 14)**

# COMPUTER GRAPHICS

No. of Credits: 4

Instruction Weeks / Semester: 14 Instruction Hours / Week: 4

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## UNIT I

Introduction- Image processing as picture analysis, Advantages of Interactive Graphics, Representative uses of computer graphics, Classification of applications, Development of hardware and software for computer graphics, Conceptual framework for Interactive Graphics.

Scan Converting Lines – Basic Incremental algorithm, Midpoint Line algorithm and additional issues; Scan Converting Circles, Scan Converting Ellipses, Solid Filling – Rectangles, Polygons and Ellipse arcs; Pattern filling, Thick primitives, Cohen-Sutherland line clipping algorithm, Parametric line clipping algorithms, Sutherland-Hodgeman polygon clipping algorithm, Generating characters and Antialiasing.

## UNIT II

Display Systems - Raster-scan and Random scan.

Geometrical transformations – 2D transformations, Homogeneous coordinates, Matrix representation of 2D transformations, Composition of 2D transformations, Window to view-port transformation, Matrix representation of 3D transformations, Composition of 3D transformations and Transformation as a change in coordinate system.

Representing Curves and surfaces – Polygon meshes, Parametric cubic curves, Parametric bicubic surfaces and Quadric surfaces.

Fractals – Lines and Surfaces.

UNIT III

Viewing in 3D - Projections, Specifying an arbitrary 3D view, Examples of 3D viewing, Mathematics of planar geometric projections, Implementing planar geometric projections, Coordinate systems.

Solid Modeling – Representing solids, Regularized Boolean set operations, Primitive instancing, Sweep representations, Boundary representations, Spatial-Partitioning Representations, Constructive solid geometry, Comparison of representations, User interfaces for solid modeling.

**UNIT IV**

Achromatic and Colored Light – Achromatic light, Chromatic color, Color models for raster graphics, Reproducing color, Using color in computer graphics.

Visible Surface Determination – Functions of two variables, Techniques for efficient visible surface algorithms, z-Buffer algorithm, Scan-line algorithms, Visible surface ray tracing.

**UNIT V**

Illumination Models - Ambient light, Diffuse reflection, Atmospheric attenuation.

Shading Models – Constant shading, Interpolated shading, Polygon mesh shading, Gouraud shading, Phong shading, Problems with interpolated shading.

Surface Detail – Surface-detail polygons, Texture mapping, Bump mapping.

Animation – Conventional and Computer-Assisted animation, Animation languages, Methods of controlling animation, Basic rules of animation, Problems peculiar to animation.

**Text Book:**

Hughes J F, Van Dam A, Foley J D, et al., *Computer Graphics: Principles and Practice*, 3rd edition, Addison-Wesley, 2013.

**Reference Books:**

1. Foley J D, Van Dam A, Feiner S K, John F H, *Computer Graphics: Principles & Practice in C*, 2nd edition, Pearson Education, 1995.
2. Guha S, *Computer Graphics Through OpenGL: From Theory to Experiments*, Chapman & Hall/CRC, 2010.
3. Hearn D D, Baker M P, Carithers W, *Computer Graphics with Open GL*, 4th edition, Prentice Hall, 2010.
4. Shirley P, Ashikhmin M, Marschner S, *Fundamentals of Computer Graphics*, 3rd edition, A K Peters/CRC Press, 2009.
5. Xiang Z, Plastock R A, *Schaum's Outline of Computer Graphics*, 2nd edition, McGraw-Hill, 2000.
6. Maurya R K, Computer Graphics with Virtual Reality Systems, Wiley, 2009.